ABSTRACT

Title of Dissertation: NORMATIVE SOCIAL INFLUENCE ACROSS CULTURES: THE IMPACT OF INJUNCTIVE AND DESCRIPTIVE SOCIAL NORMS IN MESSAGE-BASED PERSUASION

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This research seeks to understand how normative appeals differentially affect behavioral change across cultures. Two types of social information commonly used in persuasion include descriptive norms (i.e., information regarding the frequency of specific behaviors in a situation) and injunctive norms (i.e., forms of social coercion that tell people what ought to be done). A combination of three experiments and a field study systematically examined the effectiveness of different types of social norms in cultures that vary on their strengths of norms—or tightness looseness. In general, normative appeals differentially affected behavioral change across cultures. More specifically, both injunctive norm and descriptive norms were more effective than the control in influencing behavioral intentions in a tight culture versus a loose culture (e.g., China versus the U.S.) (study 1). In loose cultures, injunctive norm appeals showed a “boomerang” effect, whereby exposure to injunctive norms

decreased, rather than increased the amount of donation compared to control (study 2). Further, in loose cultures, the injunctive norm message enhanced the strength of the threat to freedom and elicited psychological reactance, which in turn decreased their intention to follow the advocated behavior (study 3). The results provided evidence that psychological reactance contributed to injunctive norm's "boomerang" effect. Finally, a field study (study 4) showed injunctive norm messages represented to be a promising technique for "nudging" water conservation behavior. Unexpectedly, the results showed that an injunctive norm message coercive words messages were more effective in promoting water-saving behavior than injunctive norm message without coercive words. Theoretical and practical implications are discussed.

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by

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Introduction and Overview

For the past few decades, social norm marketing campaigns have been deemed full of promise. The New York Times Magazine once called social-norms marketing one of the most noteworthy ideas of the year (Frauenfelder, 2001). Despite the widespread adoption of these campaigns in the Western Hemisphere, however, little attention has been paid to normative influences in a cross-cultural context. Global marketing service expenditure is growing at a rapid pace and is expected to reach a total spending of $578 billion by year's end (Zenith, 2017). Though successful marketing campaigns can yield tremendous financial rewards, unsuccessful campaigns cost time, money, and reputation. Social-norm marketing research must extend beyond Western samples to validate the application of social norm appeals in a global market.

Two common normative approaches that marketers use include descriptive and injunctive norms (Cialdini, Kallgren, & Reno, 1991; Cialdini, Reno, & Kallgren, 1990; Nolan, Schultz, Cialdini, Goldstein, & Griskevicius, 2008; Reno, Cialdini, & Kallgren, 1993; Schultz, Nolan, Cialdini, & Griskevicius, 2007). Descriptive norms provide information regarding the frequency of specific behaviors in a situation, and injunctive norms serve more as a form of social pressure associated with attitudinal disapproval or approval of one's behavior. For example, the University of Arizona's social norms media campaign used descriptive norm messages to help reduce heavy drinking on campus (Johannessen & Glider, 2003). They placed advertisements in their campus newsletter with messages such as, "Most UA students have 0, 1, 2, 3, or at the most 4 drinks when they party" and "64% of UA students have 4 or fewer

drinks when they party". Alternatively, Michigan State University used injunctive norm messages to reduce heavy drinking. They placed the posters and fliers in residence halls, the bars and restaurants around town with messages such as "95% of MSU students disapprove of pressuring someone to drink more than they want to."

Research shows that both descriptive and injunctive normative messages can effectively change consumers' attitude and behaviors. However, most research on injunctive and descriptive norms have been conducted in western cultural contexts. This dissertation is the first to propose a set of studies including laboratory experiments and field research to systematically examine how sociocultural factors (e.g., cultural variation in the strength of social norms) affect persuasion in a variety of behavioral contexts, including prosocial and health behaviors. Whereas tight cultures have strong norms and low tolerance for deviance, loose cultures have weak norms and high tolerance for deviance. I predict that while both descriptive norm and injunctive norm messages are effective at achieving persuasion in tight cultures, injunctive norm messages are met with resistance, and even backfire, in loose cultures. Psychological reactance is proposed to mediate this effect. Moreover, I explore how manipulating features of injunctive norms that may mitigate psychological reactance in loose cultures. By reframing injunctive normative appeals to be less constraining, they may elicit less reactance and more influence in behavioral change in loose cultures.

This dissertation proceeds in the following manner. Chapter 1 provides the relevant literature review of descriptive and injunctive normative influences. Chapter 2 introduces psychological reactance theory as the explanatory mechanism for the

failure and/or unintended effects of injunctive normative appeals. Chapter 3 discusses research on the key explanatory framework underlying this research—tightness and looseness (Gelfand et al., 2011; Gelfand, Nishii, & Raver, 2006) which pertains to the strength of social norms and tolerance for norm deviance in a culture and how it might affect the persuasive impact of different normative appeals. Chapter 4 addresses the contributions and predictions of the current research. Chapters 5-8 each presents a separate study that tested the questions posed and predictions formulated in Chapter 4. Chapter 9 discussed the theoretical and practical implications of the study. Taken together, using a variety of methods, including experiments and field studies, I provide the first test of how normative appeals can differentially motivate behavior change across cultures.

Chapter 1: Social Norm Messages in Persuasion

When encouraging consumers to engage in health-promoting behaviors, marketers and public health advocates often take advantage of the persuasive power of social norms. In 1990, Health Enhancement Services at Northern Illinois University was the first to use social-norms marketing methods to inform students that, contrary to what they believed, the majority of their peers had fewer than five drinks when they partied. By 1999, heavy episodic consumption of alcohol (five or more drinks) by Northern Illinois University students was down 44 percent (Perkins, 2003). Since then, numerous colleges and universities have used this evidence-based approach to promote student health and well-being. Social-norms marketing has moved beyond college campuses----various state health departments are using these techniques to address issues like smoking, use of seat belts, safe sex, and sexual assault (Smith, 2006).

Indeed, research has increasingly shown the power of social norms for understanding and changing a constellation of attitudes, intentions, and behaviors, such as sustainable consumer behaviors (Allcott, 2011; Goldstein, Cialdini, & Griskevicius, 2008; Schultz, Nolan, Cialdini, Goldstein, & Griskevicius, 2007; Schultz, 1999; White & Simpson, 2013), healthy eating (Mollen, Rizal, Ruiter, & Kok, 2013; Robinson, Fleming, & Higgs, 2014; Stok, De Ridder, De Vet, & De Wit, 2013), littering (Cialdini, Kallgren, & Reno, 1991; Cialdini, Reno, & Kallgren, 1990; Kallgren, Reno, & Cialdini, 2000; Reno, Cialdini, & Kallgren, 1993), alcohol intervention (see Borsari & Carey, 2003, for a meta-analysis), tax collection (Wenzel, 2004; Hallsworth, List, Metcalfe & Vlaev, 2017), and voting (Gerber & Rogers,

2009). This chapter reviews two distinct social norm approaches to attitude and behavior change, and empirical research on the effectiveness of different normative appeals in a variety of contexts.

Focus Theory of Normative Conduct

Rather than approach social norms as a unitary construct, Cialdini, Reno, and Kallgren (1990) theoretically divided social norms into two distinct types: injunctive norms, referring to people's beliefs about how one should behave, and descriptive norms, referring to people's beliefs about what most people actually do. More specifically, injunctive norms reflect perceptions of social approval/disapproval for a given behavior and influence individuals' behaviors based on social rewards/punishments associated with their behavior. Descriptive norms reflect the perception of what behavior is typical and influence behavior by providing information about whether a given behavior is effective or adaptive in a particular context (Cialdini, Kallgren, & Reno, 1991).

Since both types of normative influences provide information about what is socially appropriate behavior in a given situation (Reno, Cialdini, & Kallgren, 1993), the two types of norms are often congruent. That is, what is common to do is also what you should do (Lapinski & Rimal, 2005; Eriksson, 2014). For instance, individuals who go to a school library may notice that, because most others are quiet (descriptive norms), they are required to act in a similar manner and will receive social disapproval if they do not comply (injunctive norms). Although one's perception of what most others approve of and what most others do in some given situation are related, they are conceptually and motivationally distinct. In fact, in

many situations, what most others approve of is not what is common to do. For instance, most Americans would agree that people should exercise at least 30 minutes every day and eat at least 5 cups of fruit and vegetables (injunctive norms). According to the Centers for Disease Control and Prevention, 70% of Americans do not exercise 30 minutes, and nearly 90% of Americans do not eat 5 cups of fruit and vegetables (CDC, 2015).

Comparing effects of injunctive versus descriptive norms on behaviors and behavior intentions

Building on Cialdini, Reno, and Kallgren's initial distinctions between injunctive and descriptive norms, a subset of research on normative influences focused on comparing differences in the impact of descriptive versus injunctive norms on behaviors and behavior intentions. That is, researchers orthogonally manipulated injunctive and descriptive norm messages at the same level of analysis to identify the independent effects of each norm on intentions and behavior. There is mounting evidence to indicate that normative messages can have a strong influence on people's actions with regard to a variety of issues, but numerous empirical studies have shown that compared to descriptive norm messages, injunctive norm messages are less effective, and can even backfire (Allcott, 2011; Hallsworth, List, Metcalfe, & Vlaev, 2017; Stok, De Ridder, De Vet, & De Wit, 2013).

For instance, Mollen, Rimal, Ruiter, and Kok (2013) examined the influences of descriptive and injunctive norms on food choices in a field experiment. The setting for the study was an on-campus food court which served a variety of food options including salads (served in the tossed salad area) and hamburgers (served in the grill

area). These two areas were across from each other in the food court and offered similar-priced lunches. Before the field experiment, the researchers counted the number of burgers and salads sold on two consecutive days to align the descriptive norm messages with students' actual behavior. They found that, on average, each day more than 150 hamburgers and salads were sold at lunch. Based on this finding, two descriptive norm messages about salad and hamburger consumption were constructed: a healthy descriptive norm (''*Every day more than 150 university students have a tossed salad for lunch here*"), and unhealthy descriptive norm ("*Every day more than 150 university students have a burger for lunch here*"). The injunctive norm message that also pertained to tossed salads read "Have a tossed salad for lunch!" suggesting that having a salad for lunch is approved of by others. The author noted that the wording was comparable with the one Cialdini, Demaine, Sagarin, Barrett, Rhoads, and Winter (2006) used in their injunctive norm manipulation (i.e., "Please leave petrified wood in the park!") In total, there were four conditions: 1) healthy descriptive norms condition, 2) unhealthy descriptive norms condition, 3) healthy injunctive norms condition, and 4) control condition (no message). Each day one of the different norm messages was posted (or no-message for the control condition) in the food court. Using self-report questionnaires with a final sample of 231 participants, the authors concluded that the healthy *descriptive norm* resulted in more healthy food choices compared with the control condition. However, those who were exposed to the healthy *injunctive norm* poster did not make significantly more healthy food choices than those in the control condition.

In a similar vein, Robinson, Fleming, and Higgs (2014) conducted two

laboratory studies to examine the effect of two types of social norm messages and a health message on food selections in young adults. In study 1, they only compared the impact of a descriptive norm message versus a health message, and in study 2, they compare three conditions: 1) a descriptive norm message condition, an injunctive norm message condition, and a health message condition. In study 1, participants were randomly assigned to one of two conditions: 1) a descriptive norm condition or 2) a health condition. In the descriptive norm condition, the message read "*Most students eat more vegetables than you'd expect. A lot of people aren't aware that the typical student eats over three servings of vegetables each day (according to a 2011 study)*." In the health condition, the message read "*Eating a lot of vegetables is good for your health. A lot of people aren't aware that heart health and cancer risk can be improved by eating over three servings of vegetables each day (according to a 2011 study).*" They found that compared with the health condition, participants in the descriptive norm condition significantly increased the proportion of their meal derived from vegetables. In the second study, the authors included an injunctive norm message as well as a descriptive norm and health message. In the descriptive norm condition, the poster read "*A lot of people aren't aware that the typical student eats their five servings of fruits and vegetables each day. Students eat more fruit and vegetables than you'd expect*." In the injunctive norm condition, the poster read "*A lot of people aren't aware that the typical student thinks their peers should eat five servings of fruits and vegetables each day. Students think you should eat more fruit and vegetables than you'd expect*." In the health condition, the poster read: "*Eating five servings of fruit and vegetables a day can improve your health. Eating a lot of*

fruit and vegetables is good for your health." They replicated the study 1's finding that participants exposed to a descriptive social norm message made healthier food choices (i.e., had a lower mean intake of high-calorie snack food), than participants exposed to a health message. However, participants exposed to an injunctive social norm message ate similarly to participants exposed to the health message. Indeed, a meta-analysis covering a wide range of behavioral domains has shown that while both types of norms are associated with behavioral intentions, associations were stronger for descriptive norms than for injunctive norms (Rivis & Sheeran, 2003).

Indeed, in some cases, injunctive normative information seemed to backfire. In a recent study, Smith, Louis and Abraham (2017) assessed the impact of injunctive and descriptive norms on intentions to drink responsibly. They targeted one behavior that often features binge drinking sessions termed "bolting" ---- which refers to drinking alcoholic beverages in one gulp. In the pilot study, participants were either exposed to an anti-bolting campaign poster prior to completing a brief questionnaire measuring bolting intentions or just asked to fill out the brief questionnaire (control). The anti-bolting campaign poster did not explicitly convey normative information. It included four images: the first two images showed a student drinking with friends and bolting a drink, while the second two images showed the student experiencing negative consequences of drinking (i.e., fighting, vomiting). The campaign slogan was "Lash, Banter, Bolt, Error", which was displayed at the bottom of the poster, along with the statement "Think before you drink." The pilot study suggested that the campaign alone did not affect students' bolting intentions. The second study investigated whether an injunctive norm message explicitly communicating

disapproval of bolting would enhance the campaign's effectiveness. Participants were exposed to one of the four conditions, the first two of which replicated the pilot study: 1) an anti-bolting campaign poster, 2) no poster control, 3) the injunctive norm information alone (i.e., information about student disapproval of bolting), 4) the anti-bolting campaign poster combined with the injunctive norm information. In the 4th condition, the injunctive norm was manipulated by presenting the statement directly below the anti-bolting campaign poster, "70% of students [at University X] disapprove of bolting behavior". They found that there was no difference on bolting intentions between the anti-bolting campaign poster condition (1st condition) and no poster control condition (2nd condition). However, participants exposed to the anti-bolting campaign poster combined with the injunctive norm information (4th condition) reported stronger intentions to bolt than the campaign alone condition (1st condition). That is, adding an injunctive norm message (i.e., disapproval information) to the campaign backfired: it was associated with stronger intentions to bolt.

Similarly, Stok, De Ridder, De Vet, and De Wit (2014) recently examined the influence of descriptive and injunctive norms on adolescent eating behavior and behavior intentions. In their study, participants received a booklet containing questions and a short informational text. Three types of booklets were randomly distributed containing either the descriptive norm text, the injunctive norm text, or the control condition text. All participants read the following text: "*Healthy eating can contribute to being healthy. By eating healthily, you can maintain your weight and will not become overweight. In addition, a healthy eating style reduces the risk of developing several serious diseases like diabetes and coronary diseases. An*

important part of healthy eating is to consume sufficient fruit. In previous studies, we conducted at high schools, we asked high school students like yourself how they think about healthy eating". For control group participants, this message was the end of the text. Participants in the descriptive norm condition also received information that a majority of high school students try to eat sufficient fruit themselves, while participants in the injunctive norm condition received information that a majority of high school students think other high school students should eat sufficient fruit. Participants' intentions to eat sufficient fruit were measured right after they finished reading the informational text. Three days later, participants were asked to complete a short follow-up questionnaire about how much fruit they had consumed during the two previous days. The study found that participants in the descriptive norm condition consumed more fruit than in the injunctive norm condition and control condition. There was no difference in fruit consumption between the injunctive norm condition and the control condition. That is, the injunctive norm condition did not influence fruit intake behavior. Furthermore, participants in the injunctive norm condition reported significantly lower levels of intention to consume sufficient fruit than participants in the control condition. In sum, the study showed that a message containing an injunctive norm not only had no effect on fruit consumption behavior, but triggered a negative effect of participants' intention to consume sufficient fruits (Stok, et al., 2013). Indeed, researchers indicated that injunctive norm might have produced psychological reactance, which in turn evoked resistance to the proposed behavior (e.g., Cialdini, 2007; Stok et al., 2013; Mollen et al., 2013).

Summary

Drawing on Cialdini's focus theory, injunctive norms refer to people's beliefs about what ought to be done, and descriptive norms refer to beliefs about what is actually done by most others in one's social group. More specifically, injunctive norms motivate behaviors because of anticipated social sanctions for non-compliance with the norm, whereas descriptive norms motivate behaviors via serving as a decision-making heuristic through providing information about what is typical and what most people do (Cialdini et al., 1990). While both descriptive norms and injunctive norms can enact behavior change, a handful of studies showed that injunctive norms failed to increase desired behavior or can even backfire. Injunctive norm messages often present explicit approval/disapproval, which may be perceived as an attempt to limit one's freedom of thinking and acting. When these freedoms are restrained, people may experience psychological reactance. In the next chapter, I will introduce the psychological reactance theory and its relation to social norm influences.

Chapter 2: Psychological Reactance and Social influences

Psychological reactance theory is a social psychological theory designed to explain and predict when social influence attempt will succeed or fail (Brehm 1966, 1972; Brehm, Stires, Sensenig and Shaban 1966; Hammock & Brehm 1966). The central tenet of the theory is how individuals react when their freedom of choice is restricted. Psychological reactance is often cited as a reason that a persuasive message or campaign was unsuccessful (Hornik, Jacobsohn, Orwin, Piesse, & Kalton, 2008; Ringold, 2002, Rains, 2013). In this chapter, I provide a closer examination of psychological reactance theory, which serves a potential explanation for why injunctive norm messages sometimes have little effect on behavior change, and in some cases, even backfire.

The Theory of Psychological Reactance and Normative Influences

Brehm's psychological reactance theory has four fundamental elements: 1) freedom, 2) threat to freedom, 3) psychological reactance, and 4) freedom restoration. It suggests that individuals possess freedom and when that freedom is threatened, psychological reactance arises. Psychological reactance is defined as a motivational state where people experience motivational arousal due to a threat to or elimination of behavioral freedom (Brehm, 1989). When individuals are in the reactance state of mind, they will try to restore that lost freedom (Brehm 1966, 1972). Freedom in psychological reactance context is "not abstract considerations, but concrete behavioral realities" (Brehm & Brehm, 1981, p. 12). Reactance theory deals with specific, discrete attitudinal and behavioral freedoms in people's everyday lives. For

instance, people may have the expectation of freedom to choose whatever food they would like to eat, or hold whatever opinions they wish on sociopolitical issues.

Given that individuals have a set of expectations of freedom in their daily life, any social influences that attempt to restrict that freedom can constitute a threat, and therefore may arouse psychological reactance (Brehm & Brehm, 1981). Early research on psychological reactance and social influences focused on group conformity behaviors. In one study by Venkatesan (1966), participants were asked to evaluate and choose the best suit among three identical men's suits. They were randomly assigned to three conditions: 1) control condition, 2) conformity condition, and 3) reactance condition. In each condition, participants were allowed to physically examine the suits prior to making a choice. In the *control condition*, participants examined the suits for two minutes, and evaluated the suits individually in the absence of any group influence. In the *conformity condition*, the suits were evaluated and the choices were made in a face-to-face group consisting of four individuals, three confederates, and one participant. The confederates were told to choose B as the best suit. After examination of the suits, the experimenter asked each person to announce his choice and the experimenter made sure that the participant was always last to respond. In the *reactance condition*, the three confederates not only indicated their choices, but they made sure that they were following the judgment of the previous confederate. That is, after the first confederate stated suit B was the best suit, the second confederate would look at first confederate and say "You say B. . . .Well, I cannot see any difference either ---- I will go along with you—B is the best suit for me." And then the third confederate would say "Well, you guys chose B. Although I

am not sure, I am just going along to be a good guy. I choose B too." In this condition, when the confederates overtly enunciated that they were following the group norm, resulting in restriction of choices, the individuals tended to show psychological reactance. Indeed, the findings showed that participants in the reactance condition were less likely to follow the group norms (i.e., choose the suit B), compared to participants in the conformity condition (Venkatesan, 1966).

Indeed, explicit normative influences tell a person clearly and directly what to do, which would inflict reactance. Research by Burnkrant and Cousineau (1975) provided evidence that psychological reactance in a social influence situation would lead to a tendency to disagree with the communicator. The study was designed to understand how social influence (i.e., public product evaluations) would affect an individual's own evaluations of the product. In the experiment, participants were asked to evaluate a new brand of instant coffee. Before a participant evaluated the coffee, he/she was informed that the product evaluations displayed in front of him/her made a few days earlier by other students who were taking the same business courses as he/she. At the end of the study, they asked participants whether they aware of the normative implications of the study. Interestingly, participants who were aware of the purpose experiment had relevance to social influence rated coffee significantly less favorably (i.e., significantly less in agreement with the prior information to which they were exposed) than those who were not aware of the relevance of social influence.

Psychological reactance theory also posits that one way to restore threatened freedom is to actually engage in the forbidden behavior or embrace the attitude

threatened by the influence attempt (Brehm, 1966). In other words, if a person recognizes that a certain free behavior (or attitude) is restricted, he/she will be increasingly interested in engaging that behavior, and, similarly, he/she will be decreasingly attracted to behaviors or beliefs that are forced upon him/her. Accordingly, when social influence attempts are the source of reactance, the individual will tend to either merely ignore the social influence attempt, or engage in behaviors that are in direct opposition to those that have been advocated ---- the so-called *boomerang effect*, as a means of demonstrating choice or restoring attitudinal freedom (Brehm & Brehm, 1981; Clee & Wicklund, 1980).

Features of Normative Messages and Reactance

Social influence is a powerful determinant of behavior. Social influence can be direct and explicit when there is a clear statement of what the audience is expected to do. Any influence attempt that is perceived as impinging on audiences' autonomy or personal freedom, however, can lead to psychological reactance (Brehm & Brehm, 1981; Chartrand, Dalton, & Fitzsimons 2007). Indeed, studies on psychological reactance and *boomerang effect* have provided substantial evidence that freedom-threatening messages that are intense, explicit, and use concrete language with a clear intent to persuade tended to inhibit persuasion (Benoit, 1998; Worchel & Brehm, 1970).

Specific features of normative messages are more likely to elicit reactance. In particular, persuasive messages with features of explicit and strong language about what has to be done can be perceived as freedom threatening and elicit more reactance. Miller, Lane, Deatrick, Young, and Potts (2007) examined the levels of

controlling language and lexical concreteness within health messages. In their study, they presented young adults with health promotional messages. They manipulated the messages and created a total of eight experimental conditions, 2 (controlling/non-controlling) x 2 (concrete/abstract) x 2 (restoration of freedom/no restoration filler). More specifically, controlling language was manipulated by including controlling terms such as "should," "ought," "must," and "need," or, using autonomy-supportive terms such as "could," "can," "may," and "might want to." Lexical concreteness was manipulated by offering concrete specifics (e.g., "burn up to 440 calories per hour," "develop greater lung capacity") or abstract generalities (e.g., "maintain optimal health," "stay in good physical shape"). Restoration of freedom was manipulated by including either a restoration postscript (e.g., "you don't have to listen to any of these messages," "you know what is best for yourself") or a nonrestorative filler postscript at the end of the message. Results showed many negative outcomes associated with the use of controlling language but suggested more positive outcomes related to the use of restoration post-scripts. The study reinforced the notion that higher levels of controlling language lead to higher levels of psychological reactance including higher levels of anger, more negative cognitive evaluations of the message, less favorable assessments of the message topic, less intention to behave in advocated ways, and more negative perceptions of source credibility (Miller, Lane, Deatrick, Young & Potts, 2007).

Conceptualizing and Measuring Psychological Reactance

Although psychological reactance theory was developed nearly three decades ago, it has entered its dormancy in the social influence literature. It may be largely

due to the difficulty in operationalizing concepts in the theory and limited success of many reactance experiments (Burgoon, Alvaro, Grandpre & Voulodakis, 2002). Indeed, only until recently, psychological reactance has been considered an "intervening, hypothetical variable" that could not be directly measured and was only inferred based on responses to a freedom threat (Brehm & Brehm, 1981). Dillard and Shen (2005) challenged this notion and argued that, in order to advance the understanding of the role of reactance in persuasive messages, the construct of psychological reactance must be conceptualized more concretely and made amendable to direct measurement. To address the issue, they advanced the claim that reactance might be conceptualized as affect and/or cognition.

Dillard and Shen (2005) contended that reactance might be considered as negative affect in the form of anger. Such a conceptualization is consistent with Brehm's description of reactance as the experience of hostile and aggressive feelings (Seltzer, 1983; White & Zimbardo, 1980; Wicklund, 1974). The behavior tendency associated with anger is also aligned with some of the responses to reactance outlined by Brehm and Brehm (1981). Anger motivates behaviors such as avoidance-related behavior and rejecting (Dillard & Peck, 2001; Marsh, Ambady & Kleck, 2005). In this light, reactance might be operationalized using a variety of anger measures including asking individuals to make a judgment on a close-ended scale regarding the degree to which they are experiencing anger (e.g., irritated, angry, annoyed, or aggravated). Dillard and Shen (2005) also argued that reactance might be conceptualized as negative cognition. It is plausible when people encounter a freedom-threatening message, they would respond to it with unfavorable cognitions

about the message, such as counterarguments (Silvia, 2006; Worchel & Brehm, 1971; Wright, 1986). From this perspective, reactance can be operationalized as counter-arguing and measured using a thought-listing technique (Cacioppo & Petty, 1981).

The results of Dillard and Shen's (2005) experiments provided support for the intertwined model of reactance in which reactance has both cognitive and affective components (Dillard & Shen, 2005). In the study, they proposed a single-process cognitive model, a single process affective model, a dual-process model, and an intertwined model (see Appendix A for an illustration of each model). Two single process models assume that reactance is either purely cognitive or affective phenomenon. The dual-process model assumes that cognition and affect can be discriminated. The intertwined process model is modeled as a latent variable indexed by affect and cognition, and suggests that affect and cognition are so closely interwoven that they are better thought of as indicators of an underlying concept than as distinct phenomena. After comparing the fit indices of four models, they found that that the intertwined model is superior to any other alternative models. Since then, several studies have been conducted and provide evidence generally aligned with the intertwined model (e.g., Quick, 2012; Quick & Kim, 2009; Quick & Stephenson, 2008). Rains and Turner (2007) conducted two experiments examining the cognitive and affective processes involved in psychological reactance. They examined the intertwined model and dual-process model that proposed by Dillard and Shen (2005), along with a linear affective–cognitive model. They argued that emotion might precede cognition in a linear fashion. That is, people feel emotions before engaging in cognitive interpretations (Zajonc,1980, 1984). They found that the intertwined model

has a better model fit than the other two models. A recent meta-analytic review of reactance research also supported the intertwined model (Rains, 2013). The author included a final sample of 20 studies (N=4,942) to test and evaluate path models representing competing conceptualizations of psychological reactance. The results confirmed that the intertwined model best fits the sample data.

Summary

Brehm (1966) first introduced the psychological reactance theory, which is concerned with how individuals react when their freedom to choose is restricted. Injunctive normative messages convey information of what people should do, which is explicitly directive in nature. Psychological reactance theory predicts that the more directive and controlling a persuasive message is perceived to be, the more likely its position is to be rejected. It serves as a potential explanation for why injunctive norm messages sometimes have little effect on behavior change, or even at the risk of producing *boomerang effect*. Simply put, people do not appreciate being told how they should behave. People at different developmental stages value independence and freedom and tend to resist many, if not most, authority-based appeals. Members of specific cultural groups may be more resistant to any persuasive messages that they consider to be controlling (Burgoon et al., 2002). In the next chapter, I will demonstrate that tightness-looseness is an important cultural variable that may differentiate how people react to normative influences.

CHAPTER 3: Cultural Tightness-looseness and Normative Influences

In this chapter, I argue that different types of normative appeals will vary in their effectiveness based on the cultural context in which people are embedded. In particular, I integrate research on cultural tightness-looseness, which refers to variation in the strength of norms and tolerance for deviant behaviors in a given cultural group (Gelfand et al., 2011), with the literature on persuasion to advance research in both literatures. Norm strength refers to unwritten rules and social pressures that individuals feel they must follow in a given culture; tolerance refers to the severity of punishments that result when individuals violate norms. By definition, tight cultural entities have strong norms and low tolerance for deviance, whereas loose cultural entities have weak norms and high tolerance for deviance. This chapter reviews tightness-looseness theory and past research, from its anthropological origin to its growing presence in the field of cross-cultural psychology.

Tightness-looseness and its Anthropological Origins

As a construct, tightness-looseness originated in the field of anthropology, where it was used to differentiate between the strong versus weak social norms of primarily traditional societies (Pelto, 1968). Pelto (1968) was the first to quantify this distinction in his study of 21 traditional societies. He focused on concrete structural features of the societal order and developed a 12-item tight-loose scale base on these three main catachrestic: 1) the communal ownership of economic resources, 2) the corporacy of kin groups (i.e., whether the group operates as a single social body or as a collection of individuals), and 3) the community hierarchy of religious and civil

authority. Base on this measure, he found that the Hutterites, Hanno, and Lubara were among the "tightest" societies with strong norms and severe punishments for norm violations. By contrast, the Kung Bushman, Cubeo, and Skolt Lapps were among the "loosest" societies with weaker norms and greater tolerance of norm violations.

Pelto identified two ecological characteristics that may help account for the differences between tight and loose societies: differences in degree of dependence on food crops and differences in population density per square mile. In particular, he argued that societies with high population density and greater crop dependency were tighter given that strong social norms were needed to coordinate for survival in such contexts. On the other hand, societies with lower population density and less reliance on agriculture could afford more permissiveness because they did not require as much coordinated behavior. Further, traditional societies with high population density and primarily agricultural subsistence methods tended to exhibit strict child-rearing practices, strict roles and expectations for its members, and greater incidence of behavioral conformity (Barry, Child, & Bacon, 1959; Berry, 1979).

The Development of Tightness-Looseness Theory in Modern Societies

Pelto's work is important for its theoretical insights into the causes of societal differences in tightness-looseness. Expanding upon the early work on tightness-looseness in traditional societies, Gelfand, Raver, Nishii, Leslie, Lun, Lim and colleagues (2011) developed a multilevel theory of tightness-looseness in modern societies (Gelfand, Nishii, & Raver, 2006; Gelfand et al., 2011). Grounded in an eco-cultural tradition (Berry, 1979; Triandis, 1972), modern tightness-looseness theory is about adaptation. In particular, societies adapt to the characteristics of their ecological

environments and individuals adapt to the characteristics of the resultant strength of social norms.

Gelfand and colleagues (2011) proposed that societal threat was one of the primary causes of tightness-looseness differences between modern societies. More specifically, societies with more natural disasters, higher disease prevalence, fewer natural resources, and greater threat from territorial invasions are theorized to develop stronger norms and sanctions in order to coordinate to survive such threats. By contrast, societies that lack exposure to serious ecological and human-made threats can afford to have weaker norms and tolerance for deviance given that they have less need for coordinated social action. Consistent with tightness-looseness theory, this suggests that societies develop stronger norms and a lower tolerance for norm deviance in an effort to confront and cope with these threats via coordinated social action.

As societies develop strong or weak societal norms to be adaptive to their particular environments, the strength of social norms is further reflected and promoted through institutions that foster strong versus narrow socialization. The media, schools, government, and police (Arnett, 1995) and everyday situations (Mischel, 1977) dictate the range of acceptable behavior. In particular, tighter nations exhibited a less open and free media, greater autocratic governing bodies, fewer political rights and civil liberties, retention of the death penalty, lowered access to new information and technology, a lower percentage of people who report participating in collective action such as boycotts and strikes, a greater percentage of people stating that they would never participate in collective action, and a greater

importance of God and religious attendance (Gelfand et al, 2011). In turn, at the individual level, people exposed to chronically higher situational strength have higher felt accountability (Frink & Klimoski, 1998). That is, they feel compelled to conform to societal norms and avoid punishment. As adaptation to such heightened accountability, individuals exhibited the constellation of characteristics such as a greater prevention-focus, more self-regulation and impulse control, higher need for structure, and increased self-monitoring (Gelfand et al., 2011; Harrington & Gelfand, 2014).

The societal and individual level predictions from modern tightness-looseness theory have been supported at multiple levels of analysis. At the national level, Gelfand et al. (2011) developed and employed a 6-item measure of tightness-looseness and sampled 6,823 individuals from 33 different nations. The results show high agreement on perceptions of social norm strength and tolerance of deviance within nations as well as significant variation between nations. This indicates that tightness- looseness as cultural dimension, is a highly shared, collective construct that captures important differences between modern societies. Tight nations included Germany, India, Japan, Mexico, Norway, China, Portugal, Turkey, Pakistan, Singapore, Malaysia, and South Korea. Loose nations included Ukraine, Estonia, Hungary, Brazil, New Zealand, the U.S., Israel, Venezuela, Australia, Greece, and the Netherlands. Consistent with the multilevel theory, they found that nations scoring high on tightness indeed faced greater ecological and historical threat such as population density in 1500, invasions of a hundred years, resource scarcity, pathogens, and natural disasters.

At the state level, Harrington and Gelfand (2014) also found that tighter states exhibited a higher incidence of natural disasters, greater environmental vulnerability, greater disease prevalence and higher health vulnerabilities, and fewer natural resources. They found the same tight-loose personality "trade-off" between tight and loose states that were consistent with findings at the national level. They found that tight states had higher scores on the personality dimension of conscientiousness, a personality characteristic that has been associated with greater impulse control, cautiousness, self-discipline, ability to delay gratification, desire for orderliness, and conformity to norms (John, Naumann, & Soto, 2008). On the contrary, loose states had higher scores on the personality dimension of openness, which has been associated with nontraditional values and beliefs, breadth of experience, interest and curiosity toward new ideas, tolerance of other cultures, and a preference for originality (John, Naumann, & Soto, 2008; Rentfrow, Gosling, & Potter, 2008).

Integrating research in tightness-looseness with evolutionary game theory, Roos, Gelfand, Nau, and Lun (2015) modeled the evolutionary emergence of social norms. The authors show a causal relationship between threat and tightness, illustrating that strong norms and punishments are needed in contexts of high societal threat. Specifically, groups that face a high degree of threat develop stronger norms for organizing social interaction than those who face comparatively weaker threat. Their results informed the development of both cooperation and coordination norms, and represented the first mathematical formulation of cultural tightness–looseness theory.

At the individual level, recent research has begun to examine the neurobiological underpinnings of the strength of social norms. By employing electroencephalography (EEG), Mu, Kitayama, Han, and Gelfand (2015) found that individuals in a tight culture (China) have stronger neurobiological reactions to social norm violations compared to individuals in a loose culture (the United States). In the study, they examined the N400 response (i.e., a negative-going deflection that peaks at approximately 400 ms and occurs with exposure to unexpected anomalous stimuli) among participants from tight and loose countries — China and the U.S. The authors developed a new social norm violation task in which participants were asked to rate how appropriate a behavior (e.g., dancing) was in three different situations. Each situation was crafted so that the behavior was either strongly inappropriate (e.g., art museum), weakly inappropriate (e.g., subway platform), or very appropriate (e.g., tango class). They found that only Chinese participants exhibited an N400 response to norm violations over the frontal regions, an area previously found to be associated with judgments of the appropriateness of a variety of human actions, theory of mind, and punishment (Bach, Gunter, Knoblich, Prinz, & Friederici, 2009; Gunter & Bach, 2004; Reid & Striano, 2008). In addition, culture-specific N400 responses mediated cultural differences in perceptions of cultural superiority, self-control, and creativity, which again, illustrate "trade-offs" of tightness and looseness, namely of greater order, stability, and cohesion in tight groups but greater creativity and openness in loose groups.

Tightness-looseness researchers have extended their work to novel directions. Research in management science, for instance, has demonstrated that CEOs in tight

cultures have less discretion (i.e., latitude of managerial action), as compared to CEOs in loose cultures (Crossland & Hambrick, 2011). Further, Atkas, Gelfand and Hanges (2016) investigated how cultural tightness-looseness affect people's perception of effective leadership styles. Controlling for other cultural dimensions (e.g., collectivism, power distance, etc), they found that tight cultures perceived autonomous leadership as more effective, which suggested effective leaders in tight cultures should be extremely confident and make decisions independently. They also found that loose cultures perceived charismatic and team leadership as more effective, which indicated that effective leaders in loose cultures are expected to be team orientated and emphasize empowerment and change. In addition, tightness–looseness has also been linked to organizational creativity. Chua, Roth, and Lemoine (2015) found that individuals from looser cultures are better at engaging and succeeding on creative tasks from foreign cultures, while individuals from tight cultures do poorer on foreign creative tasks and are less receptive to creative ideas from foreign cultures. This finding is consistent with evidence from Harrington and Gelfand (2014), who found poorer creativity outcomes for tighter states.

Recent research also has begun to examine cultural clashes that occur when people from tight and loose cultures interact. In a multilevel longitudinal study of sojourners, Geeraert, Li, Ward, Gelfand and Demes (2018) found that individuals who move to tighter cultures generally have lower psychological and socio-cultural adaptation and higher stress as compared to individuals who move to looser cultures. Taking an interactionist perspective, however, they showed that this effect was moderated by sojourners' personality. Individuals who were more agreeable and had

higher honesty-humility adapted better in tight countries compared to individuals who were lower on these traits. In a study on cross-border acquisitions, Li, Gelfand, & Kabst (2017) found that the value obtained by acquirers decreased by over $34.3 million on average for a one standard deviation increase in TL differences in cross-border deals.

Social Norm Influences and Cultural Tightness-looseness

I theorize that tightness-looseness plays an important moderating role in the influence of injunctive norms and descriptive norms on behaviors and behavioral tendencies. While descriptive and injunctive normative appeals may be equally effective in tight cultures, I expect that descriptive normative appeals are much more effective in loose cultures and that injunctive normative appeals will be ineffective, as mediated by psychological reactance.

In tight societies, social norms are pervasive and clearly defined (Gelfand et al., 2011). Tight cultures, particularly those which have experienced a high degree of ecological and historical threat, may develop relatively rigid and pervasive social norms, injunctive norms in particular, as to how one should behave in relation to others. Children are brought up in an environment where norm abidance is highly praised and behaviors deviant from the norms are punished harshly (Halloway, 1999; Ho, 1981; Pearson, 1984). If someone acts inappropriately, others will strongly disapprove. Therefore, individuals in tight cultures will be likely to avoid behaviors that are disapproved by others, and behave in a manner approved by others. Indeed, past research provided support for the idea that individuals from a tight culture are more influenced by the approval of those around them. Accordingly, social normative

appeals including descriptive and injunctive norms should both be effective in tight cultures. I will also explore the possibility that compared to descriptive normative influences, injunctive norms may exert an even more powerful influence on behavior in tight cultures because injunctive norms may signal punishment potential if people fail to comply.

Contrary to tight cultures, individuals in loose cultures have few external constraints and are offered a wide range of behavioral options and personal discretion. Thus, injunctive norms can be received as an attempt to threaten one's freedom of making a decision, which can in turn elicit psychological reactance. Indeed, Chapter 1 documented a few studies where injunctive norms messages failed to change people's behavior, and in some cases, backfired. Those studies were all conducted in loose cultures, such as the United States, the United Kingdom, and the Netherlands. In loose cultures, since there are few external social cues about how to behave in many situations, descriptive norms (i.e., social information) may serve to navigate people's behavior. That is, rather than suggesting how one should behave (i.e., injunctive norms), norms may be more descriptive, which provide guidelines as to the behaviors that are commonly exhibited in one's environment.

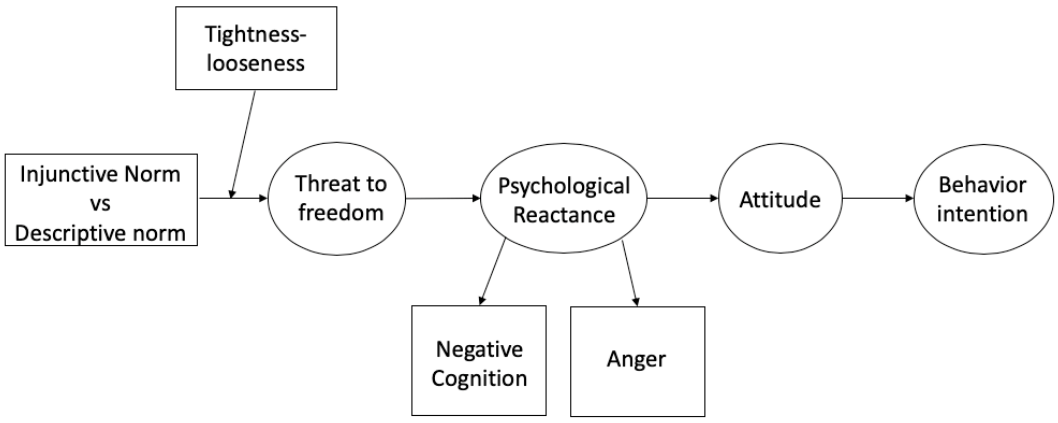
Though there has been no research to test these notions directly, one study provides some preliminary support for the theory. Walker, Courneya, and Deng (2006) conducted telephone interviews with both British-Canadians and Chinese-Canadians participants on their intentions to play the lottery. They asked participants their perceived injunctive norm (e.g., do you believe others approve or disapprove?) and descriptive norm (e.g., do they actually do it or not?) on playing lottery. They

found that British-Canadians' intentions to play the lottery were guided by descriptive norms, whereas Chinese-Canadians' intentions were more influenced by injunctive norms than descriptive norms. It should be noted, however, that this research did not manipulate injunctive norms versus descriptive norms. It simply measured the perceived norms and didn't measure psychological reactance.

Summary

This chapter explores the ways in which variation in cultural tightness-looseness plays a role in the influence of injunctive norms and descriptive norms on behavior. While descriptive norm messages may be effective at achieving persuasion across cultures, injunctive norm messages are more likely to be perceived as threat to freedom, and in turn, met with psychological reactance in cultures that have weak norms and high tolerance for deviance (i.e., loose cultures). The elevated threat to freedom from injunctive norm influences may be attenuated in cultures that have strong norms and low tolerance for deviance (i.e., tight cultures) (see Figure 1).

Figure 1. Moderated Path Model



Chapter 4: Contributions and Predictions of the Current Research

The current research makes several notable contributions to the literature. First, theorizing and empirical research on the persuasive impact of injunctive norms and descriptive norm messages has been largely done in loose cultures, such as the United States (e.g., Cialdini, Kallgren, & Reno 1991; Cialdini, Reno, & Kallgren 1990, Jacobson et al., 2015), the Netherlands (e.g., Mollen et al., 2013; Melnyk et al., 2011; Stok et al., 2014), and Australia (e.g., Smith & Louis, 2008). There is a scarcity of work examining normative influence in tighter cultures. Until recently, the connection between normative influences and the macro sociocultural contexts (e.g., cultural variation in the strength of social norms) in which they are embedded, have not been examined. This research explores cultural tightness-looseness as a moderator of normative influence. By doing so, I will be able to determine the cultural contexts in which normative messages will be most effective and the contexts in which normative messages can lead to unfavorable effects.

In loose cultures, rather than requesting how one should behave (i.e., injunctive norms), norms may often be descriptive, providing guidelines as to what behaviors are commonly exhibited in one's environment. On the other hand, tight cultures, particularly those that have experienced a high degree of ecological and historical threat, may develop relatively rigid and pervasive injunctive norms as to how one should behave in relation to others. Further, while descriptive social norms move people to act via social information, injunctive social norms mobilize them via social evaluation (Cialdini, 2007). The higher the social evaluative pressure, the more

salient are injunctive norms, and the more they influence individual behavior. In tight cultures, social evaluations are likely to be more frequent and the relevant norms are more likely to be injunctified (Kay et al., 2009). Moreover, tighter cultures more frequently create strong situations and looser cultures more frequently create weak situations. In strong situations, social norms (and especially injunctive norms) will guide individuals' behaviors because surveillance and sanctioning are salient. In weak situations, since there are few external social cues about how to interpret the task and respond, descriptive norms (i.e., social information) may serve to navigate people's behavior. Theory of Planned Behavior assumed that behavior intention is the best predictor of future behavior (Ajzen, 1985, 1991; Ajzen & Madden, 1986). Given this, I first hypothesize that: *in loose cultures, injunctive normative messages are less effective in influencing behavior intentions compared to descriptive normative messages* **(H1a)**, and *in tight cultures, there is no difference in influencing behavior intentions between injunctive normative and descriptive normative appeals* **(H1b)**. I then hypothesize that the same pattern can also be found in predicting behavior: *in loose cultures, injunctive normative messages are less effective in influencing behavior compared to descriptive normative messages* **(H2a)**, and *in tight cultures, there is no difference in influencing behavior between injunctive normative and descriptive normative appeals* **(H2b)**.

Second, I propose to further test the mechanism between normative influences and behavioral change by examining the mediating role of a theoretically relevant construct: psychological reactance. Although research has indicated normative influences may result in psychological reactance, which in turn hinders behavior

change (e.g., Cialdini, 2007; Stok et al., 2013; Mollen et al., 2013), no direct tests have assessed the relationship between two types of social norm influences and psychological reactance. Particularly, it is suggested that injunctive norm messages, with a nature of being explicit and direct, may trigger psychological reactance. This research will directly measure psychological reactance and its relation to normative influences in a cross-cultural context. It provides insights for why injunctive norm messages in certain cultural context have little effect on behavioral change, or even risk producing *boomerang effects*. I hypothesize that *compared to descriptive norms, injunctive norms will be less likely to affect behavioral change as mediated by reactance* **(H3a)***, but that this is moderated by the cultural context such that reactance is stronger in loose than tight cultures* **(H3b)**.

Finally, I highlight the importance of normative message features. Little attention has been paid to the features that may be associated with arousal and/or inhibition of psychological reactance in social norm persuasion. This lack of attention may result in social norm research studies or campaigns in loose cultures that fail to produce desired behavior change. More specifically, injunctive norm messages deliver explicit commands that tell a person openly and directly what to do, frequently using forceful adverbs such as "should," "disapprove/approve", "demand" (Schultz, Khazian & Zaleski, 2008; Staunton, Louis & Smith, 2014). Examining the injunctive norm message features that could elicit freedom threat is valuable to help us better understand why injunctive norm messages may sometimes have little effect on behavior change, in some cases, even backfire in loose cultures. Identifying injunctive norm messages that are intense, explicit, and use concrete language with a

clear intent to persuade may tell us what to avoid in message design. Efforts also need to be devoted to reactance-reducing message features. There is a gap in knowledge regarding the persuasive message features that reduce reactance. For both theoretical and practical reasons, we need more research on exploring message features that could potentially diminish reactance in order to inform our ability to design injunctive norm messages that limit the use of such messages. Therefore, I will examine that *an injunctive norm message that does not use coercive words to convey social approval/disapproval will lead to more norm conforming behavior in a loose culture compared to injunctive normative messages that use coercive words* **(H4)**.

In all, this dissertation aims to examine a series of phenomena and predictions theoretically related to normative influences across tightness-looseness cultures. To test the above predictions, I conducted four studies using a mixed methods design. Study 1 (Chapter 5) compared the persuasive power of injunctive versus descriptive normative messages in influencing behavior intentions in a tight culture (China) and a loose culture (the United States). Study 2 (Chapter 6) compared the persuasive power of injunctive versus descriptive normative messages in influencing behavior in China and the United States. Study 3 (Chapter 7) investigated whether both types of norms are emotionally and cognitively associated with psychological reactance in a tight versus a loose culture. Finally, a field study (Chapter 8) tested the assumption that an injunctive norm message that uses coercive implied words to convey social approval/disapproval may lead to more reactance compared to injunctive normative messages that do not use coercive implied words in a loose cultural context. Notably, although normative messages are commonly used in promotion of health and

prosocial behaviors and behavioral intentions, research has rarely included them within the same study, and has not examined moderators of their effects in the same context. Importantly, I have done so across three studies including a field study, examining meaningful real-world behaviors.

CHAPTER 5: Study 1 - Injunctive and descriptive norms affect behavior intention

Study 1 compared the persuasive power of injunctive norms and descriptive norms in a tight culture (China) versus a loose culture (the United States). In this study, participants in both cultures were exposed to two types of normative appeals advocating that they volunteered to do follow-up surveys, I measured participants' intention to follow the advocated behavior.

Method

Participant. A power analysis was conducted using G*Power software to determine the sample size necessary to examine the proposed effects. In order to achieve an effect size of .25, with an alpha of .05, and power of .80. At least 270 participants were needed from the United States and mainland China separately (135 Americans and 135 Chinese). In total, 308 participants were recruited from the United States and China (155 Americans and 153 Chinese). Both the U.S. participants (U.S. citizens living in the U.S.) and Chinese participants (Chinese citizens living in mainland China) were recruited from Qualtrics Panels with quotas on sex, and age groups (over 18 years old). Participants were compensated with an incentive through Qualtrics for participation. After the completion of the experiment, participants were fully debriefed.

Procedure. A computer-based experiment was conducted in the current study, in which data were collected online. U.S. participants completed a survey in English and Chinese participants completed the survey in Mandarin Chinese. All survey

materials were developed by a team of two Chinese–English bilinguals. They were translated and back-translated between the two languages. A sample of 59 participants (28 Americans and 31 Chinese) took part in the pilot testing and were asked to comment on the mechanics of the survey. Comments from both English and Chinese versions of questionnaires were carefully examined and addressed and edited to help maximize conceptual equivalence (Brislin, 1970).

Members of the panel were invited to participate in this study by giving a URL and required to log into the study from an Internet-connected computer. Upon arriving at the study webpage, participants were instructed to complete the informed consent. After the consent procedure, participants were asked to complete a short survey to measure their perceived cultural tightness-looseness and demographics, followed by a 2-min silent distractor video of natural scenery to reduce possible carryover effects of these measures (Jacobson et al., 2015).

Manipulations. After the participants watched the distractor video, they were informed that the primary experimental session had ended and that they were invited to complete up to 5 independent short surveys (adapted from Jacobson et al., 2015). It was explained that the short surveys would take the form of 1- to 2-min surveys. Participants were also told that no penalties or extra rewards would be associated with their decision. Participants were randomly assigned to one of three conditions: descriptive norm condition, injunctive norm condition, or control condition. Participants in the *descriptive norm* condition then read the following: "Previously, 82% of participants in this study chose to complete these short surveys." In the *injunctive norm* condition, participants instead read, "Previously, 82% of participants

in this study thought you should be willing to complete these short surveys." In the *control* condition, no social norm information was provided.

Measures. *Cultural tightness-looseness.* Cultural tightness-looseness were measured with a 15-item scale adapted from Gelfand et al. (2011) to assess whether Chinese participants perceive tighter cultural norms compared to the American participants. The items on this scale assess the clarity and number of social norms, the degree of tolerance for norm violations, and overall compliance with social norms in each nation. Higher scores indicate a tighter culture. Sample items include "There are many rules that I am supposed to follow in my life" and "In my life, I almost always follow the rules." Procrustes analyses (Gelfand et al., 2011) demonstrated that the scale had metric equivalence across cultures and people in tight and loose cultures also agree on the levels of tightness–looseness in their respective nations as indicated by other validation methods. Participants responded on a 6-point scale ranging from 1 (strongly disagree) to 6 (strongly agree). Four reversed items (i.e., item #4, 8, 13, 15) were excluded from the analyses in both samples due to poor correlations with all the other items in this scale (See Appendix B for the full scale). This scale was reliable across two countries (α_{us} = .84, α_{cn} = .70).

Chinese participants scored significantly higher on the cultural tightness scale (M = 4.52) compared to American participants (M = 4.07), t=6.00, p<0.001).

Psychological needs for autonomy. Psychological needs for autonomy was measured with the autonomy subscale of the General Measure of Basic Psychological Need Satisfaction and Frustration Scale (Chen, Vansteenkiste, et al., 2015; Ryan & Deci, 2000; Vansteenkiste & Ryan, 2013), consisting of 8 items assessed on a 5-point

scale ranging from 1(not true at all) to 5 (completely true). The scale was validated in four cultures including Peru, China, Belgium, and the US and contains both the satisfaction and frustration of the psychological needs for autonomy (Chen, Vansteenkiste, et al., 2015) (See Appendix C for the full scale). Sample items include "I feel a sense of choice and freedom in the things I undertake (autonomy satisfaction)" and "Most of the things I do feel like I have to (autonomy frustration)." This scale was reliable across two countries (Autonomy Satisfaction: α_{us} = .78, α_{cn} = .81; Autonomy frustration: α_{us} = .85, α_{cn} = .84).

Chinese participants scored significantly higher on both Autonomy Satisfaction and frustration scale (Satisfaction: M = 3.86; Frustration: M = 3.16) compared to American participants (Satisfaction: M = 3.67; Frustration: M = 2.91), $t_{\text{Satisfaction}}$ =2.41, $p_{\text{Satisfaction}}$ <0.05; $t_{\text{Frustration}}$ =2.26, $p_{\text{Frustration}}$ <0.05.

Demographics. Age, sex, income, educational level, and religiosity were measured. In this study, Chinese participants had higher income (t=7.17, p<0.001), were younger (t=-10.65, p<0.001), better educated, (t=5.38, p<0.001), and less religious (t=-7.03, p<0.001) than American participants (see Table 1 for means and standard deviations for all demographic measures).

Table 1. Means and standard deviations of demographic measures of study 1

	Age		**Income level**		**Educational level**		**Religiosity**	
	US	CN	US	CN	US	CN	US	CN
Mean	50.72	33.53	2.53	3.23	3.56	4.41	4.03	2.34
SD	16.99	10.25	0.94	0.75	1.55	1.17	2.21	1.99

Outcome measure: intention to help. After reading the social norm messages, all participants were given a 6-point scale (from 0-5) asking them to indicate how many of the short surveys they would be willing to complete.

The session was concluded with a funneled suspicion probe and a full debriefing.

Results

The data were analyzed by means of two-way analysis of variance (ANOVA) using a 2 (culture: China vs. the United States) x 3 (norm type: control, descriptive norm, injunctive norm) design. The following control variables were added: *age*, *income level*, *educational level*, and *religiosity* given differences between these variables in the U.S. and China. Overall, participants who were more religious were willing to answer significantly more surveys F (1, 297) = 12.72, p<0.001), but no other control variables reached significance (all ps > .25). More importantly, the addition of the control variables did not alter the results in any way, and so I do not report them further.

The main effect of norm type is significant in this analysis F (2, 302) = 6.03, p<0.005. Post-hoc Tukey HSD analysis showed that participants were willing to answer significantly more surveys when they were exposed to injunctive norm (M = 2.42), p<0.05, or descriptive norm (M = 2.38), p<0.05 compared to control condition (M = 1.53). The main effect of culture was not significant, F (2, 298) = 0.41, p<0.102. Results revealed no significant interactions between culture and social norm type F (2, 298) = 0.03, p=0.87, which indicated there were no cross-cultural differences in

the number of surveys participants were willing to answer when exposed to different social norms.

Chinese sample were analyzed by means of one-way ANOVA. Results showed that the main effect of norm types on behavior intention was significant among Chinese participants F (2, 150) = 3.95, P<0.05. As expected, Post-hoc Tukey HSD analysis showed that Chinese participants were willing to answer significantly more surveys when they were exposed to injunctive norm (M = 2.47), p<0.01, or descriptive norm (M = 2.46), p<0.01 compared to control condition (M = 1.54). There were no significant differences in the number of surveys Chinese were willing to answer between descriptive norms and injunctive norm conditions, p=0.99.

American sample were analyzed by means of one-way ANOVA. I found no significant main effect of norm types on the number of surveys intended to complete among American participants F (2, 152) = 2.33, P=0.1, which indicated there is no evidence that control, injunctive norm, and descriptive norm messages affect behavior intentions differently among American participants.

Furthermore, I examined the data for *Psychological needs for autonomy* effects. No main or interaction effects of participant's autonomy satisfaction or autonomy frustration were found in study 1 or in subsequent experiments.

Finally, I did some exploratory analysis to test whether the individual perceived cultural tightness moderated the relationship between norm type and help intention. Controlling for culture (i.e., Chinese versus Americans), a multiple regression result showed there were no main effects of perceived cultural tightness (t=1.33, p=0.19) on helping intention. I did not find significant interactions between

perceived tightness and injunctive norm (t=-0.02, p=0.98), nor descriptive norm (t=-0.02, p=0.98), compared to control.

Discussion

Although study 1 did not show evidence to support my contention that injunctive normative messages are less effective in influencing behavior intentions in loose cultures compared to descriptive normative messages (**H1a**), it did provided evidence that in tight cultures, both injunctive norm and descriptive norms were more effective than the control in influencing behavioral intentions and there is no difference in behavior intention between Chinese participants exposed to the descriptive norms and injunctive norm condition (**H1b**). It suggested that Americans and Chinese may follow different response patterns to different types of social norms: neither types of social norm messages increase Americans' helping intention, whereas both types of social norm messages increase Chinese' helping intention.

Chapter 6: Study 2- Injunctive and descriptive norms affect behavior

In study 2, instead of measuring participants' intention to follow the advocated behavior, I measured participants' actual behavior. More specifically, I presented participants in both cultures with injunctive norms versus descriptive norms messages (or control) to attempt to persuade them to donate money to a charity, and I measured the amount of donation as their behavior outcome.

Method

Participants. A power analysis was conducted using G*Power software to determine the sample size necessary to examine the proposed effects. In order to achieve an effect size of .25, with an alpha of .05, and power of .80, 270 participants were needed from the United States and mainland China separately (135 Americans and 135 Chinese). One hundred and thirty five students (77 females, 55 males, with 1 person identified as "nonbinary") at the University of Maryland, United States and 135 students (95 females, and 40 males) at Peking University, China were recruited in exchange for $3 (for American participants) or 15RMB (for Chinese participants) for participation. Compensation rates reflect the standards at the two universities.

Procedure. A computer-based experiment was conducted in the current study, in which data were collected online. U.S. participants completed a survey in English and Chinese participants completed the survey in Mandarin Chinese. All survey materials were developed by a team of two Chinese–English bilinguals. They were

translated and back-translated between the two languages. Both English and Chinese versions of questionnaires were carefully checked and
compared and edited to help maximize conceptual equivalence (Brislin, 1970).

Students were invited to participate in this study by giving a URL and required to log into the study from an Internet-connected computer. Upon arriving at the study webpage, participants were instructed to complete the informed consent. Same as study 1, participants were asked to complete a short survey to measure their perceived cultural tightness-looseness and demographics, followed by the same 2-min distractor video to reduce possible carryover effects of these measures (Jacobson et al., 2015).

Manipulations. Participants first received information that the primary experimental session was ended and that they were invited to join a charitable cause that the university research team supports. Participants were then exposed to a charity poster on ending child hunger (see Appendix D). They were told that they could help by donating up to 3 dollars/15RMB they've just earned. It was explained that the amount they might decide to donate would be deducted from their compensation and the research team would donate on their behalf. Participants were randomly assigned to one of three conditions: descriptive norm condition, injunctive norm condition, or control condition.

Participants in the *descriptive norm* condition then read the following: "Previously, 82% of participants in this study chose to donate at least some of their earnings." In the *injunctive norm* condition, participants instead read, "Previously, 82% of participants in this study thought you should be willing to donate at least

some of your earnings." In the *control* condition, no social norm information was provided. All participants then read a question that asked them to indicate how much they would like to donate. The session was concluded with a funneled suspicion probe and a full debriefing. The participants were paid in full and no money was donated to charity.

Measures. *Cultural tightness-looseness.* Cultural tightness-looseness were measured with a reduced 11-item scale adapted from study 1 (Gelfand et al. (2011). This scale was reliable across two countries (α_{us} = .84, α_{cn} = .80). In this study, Chinese participants scored significantly higher on the cultural tightness scale (M = 4.35) compared to American participants (M = 4.09), t=-3.12, p<0.005; The results suggest there is a cultural difference between Chinese and Americans with respect to their perceived tightness.

Psychological needs for autonomy. Psychological needs for autonomy was measured with the autonomy subscale of the General Measure of Basic Psychological Need Satisfaction and Frustration Scale as in study 1. In this study, there are no mean differences in Autonomy Satisfaction or Autonomy Frustration between Chinese and American participants (autonomy satisfaction: t=0.72, p=0.47; autonomy frustration: t=1.22, p=0.22).

Demographics. Age, gender, family income, and religiosity were measured. In this study, Chinese participants were older (t=5.4, p<0.001), had lower family income (t=-6.11, p<0.001), and were less religious (t=-8.05, p<0.001) than American participants (see Table 2 for means and standard deviations for these measures).

Table 2. Means and standard deviations of demographic measures of study 2

	Age		Family Income		Religiosity	
	US	**CN**	**US**	**CN**	**US**	**CN**
Mean	20.70	22.47	3.16	2.50	2.99	1.52
SD	2.48	2.89	0.99	0.76	1.83	1.08

Outcome measure: donation behavior. After reading the social norm messages, all participants were asked how much money they would like to donate and to type their answer into a comment box. Americans participants were paid $3 for their survey participation so they were instructed to enter any amount between 0 and 300 cents, whereas Chinese participants were paid 15RMB so they were instructed to enter any amount between 0-15RMB.

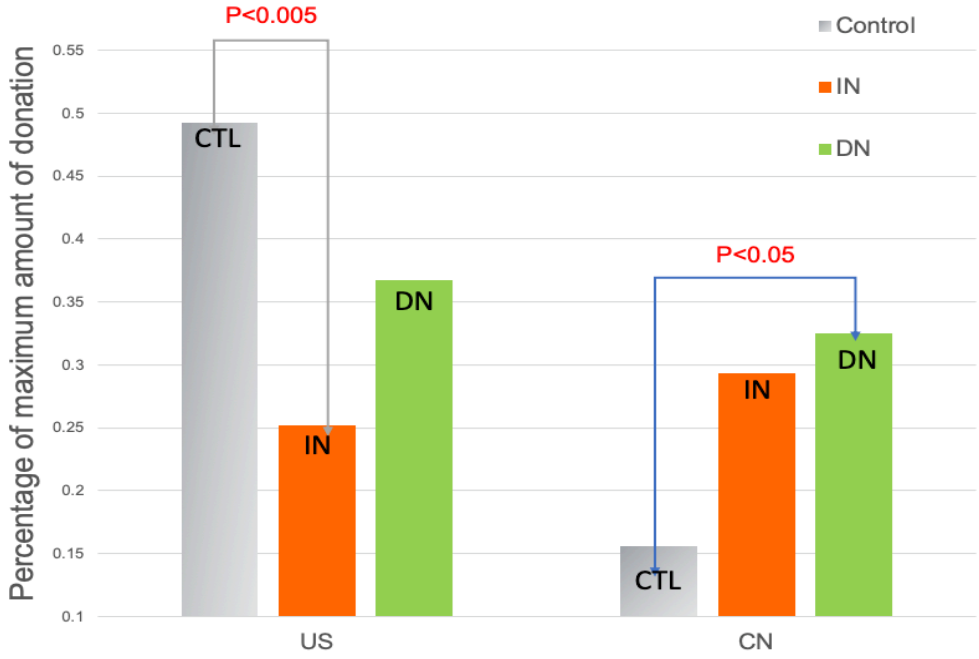
Results

The data were analyzed by means of two-way analysis of variance (ANOVA) using a 2 (culture: China vs. the United States) x 3 (norm type: control, descriptive norm, injunctive norm) design. The following control variables were added: *age*, *family income level*, and *religiosity* given differences in these variables in the U.S. and China. Overall, participants were more religious donated more money to the charity surveys F (1, 262) = 6.34, p<0.05), but no other control variable reached significance (all ps > .25). More importantly, the addition of the control variables did not alter the results in any way, and so I do not report them further.

The data were also analyzed by means of two-way analysis of variance (ANOVA) using a 2 (culture: China vs. the United States) x 3 (norm type: control, descriptive norm, injunctive norm) design. I transformed the dependent variable (i.e., amount of donation) for both cultures to a metric from 0 to 1, where I calculated the

percentage of maximum amount of donation for both cultures. For instance, if a Chinese participant donated 5RMB, he/she donated 33.33% of the maximum amount he/she received (i.e., 5RMB divided by 15RMB). If an American participant donated 100 cents, he/she also donated 33.33% of the maximum amount he/she received (i.e., 100 cents divided by 300 cents). The main effect of culture was significant in this analysis, F (2, 264) = 5.39, p<0.05, which indicated on average, Chinese participants donated less money than Americans. The main effect of norm type is not significant F (2, 263) = 0.40, p=0.4. That is, no significant differences in donation amount between injunctive norm, descriptive norm and control condition. However, as predicted, these effects were qualified by a significant interaction between culture and social norm type F (2, 263) = 5.90, p<0.005, which indicates there were cross-cultural differences in donation behavior in responding to different types of social norms (see Figure 2).

Figure 2. The percentage of maximum amount of donation that participants agreed to donate as a function of cultures and social norm type in Study 2



Simple effects tests revealed that Chinese participants donated significantly more money when they were exposed to descriptive norm (M = 0.350) compared to control (M = 0.189), $p<0.05$. Chinese participants donated marginally significantly more money when they were exposed to injunctive norm (M =0.328) compared to control (M =0.189), $p<0.1$. There were no significant differences in donation amount between injunctive norm condition and descriptive norm condition among Chinese participants ($p=0.7$).

On the other hand, American participants donated significantly less money when they were exposed to injunctive norm (M = 0.230) compared to control (M = 0.464), $p<0.005$. There were no significant differences in donation amount between descriptive norm condition and control condition, $p=0.13$, or between descriptive norm condition and injunctive norm condition, $p=0.24$.

Furthermore, Americans donated significantly more than Chinese participants in the control condition ($p=0.001$), but there were no significant differences in amount of donation between Americans and Chinese in injunctive norm condition ($p=0.24$), or descriptive norm condition ($p=0.78$).

Additional analysis was conducted to test whether the individual perceived cultural tightness moderates the relationship between norm type and donation behavior. Controlling for culture (i.e., Chinese versus Americans), a multiple regression result showed there was a main effect of perceived cultural tightness ($t=-2.37$, $p=0.02$) on donation behavior, which indicated that on average, people with higher perceived tightness donate less money compared to people with lower perceived tightness. I did not find significant interactions between perceived tightness

and injunctive norm (t=0,94, p=0.35), nor descriptive norm (t=1.36, p=0.16), compare to control.

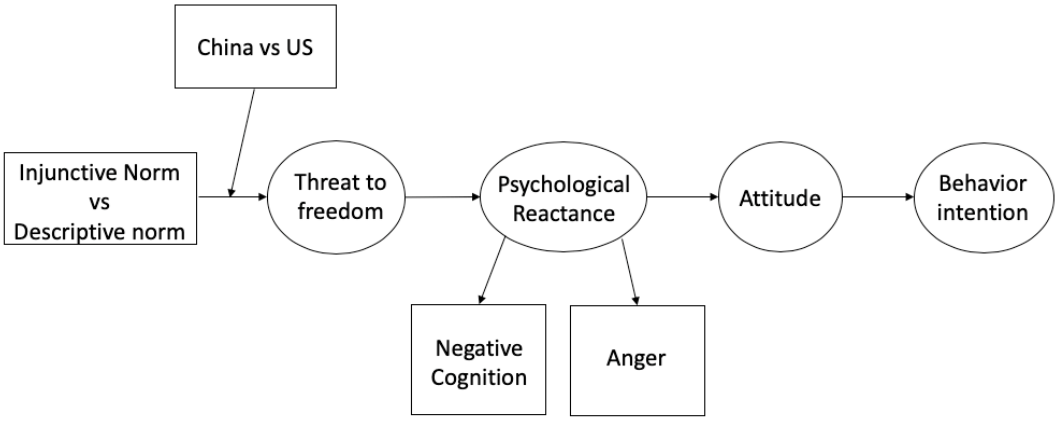
Discussion

In general, the results of study 2 supported my contention that normative appeals differentially affected behavioral change across cultures. Study 2 demonstrated cross-cultural differences in donation behavior when exposed to injunctive versus descriptive norms. More specifically, in loose cultures, injunctive norm appeals showed a "boomerang" effect, whereby exposure to injunctive norms decreased, rather than increased the amount of donation compared to control. In tight cultures, when exposed to injunctive norms, on average, Chinese participants donated more money compared to control, but the effect was only marginal. Furthermore, the descriptive norm was more effective in influencing donation behavior than the control condition among Chinese participants.

Chapter 7: Study 3-Normative Influences and Psychological Reactance

Study 1 and study 2 showed some evidence of cultural differences, in that American participants have exhibited "boomerang" effect when exposed to injunctive norm appeals, whereas Chinese participants were more likely to be persuaded by descriptive norms and, sometimes, injunctive norms compare to control. Study 3 aimed to explore the resistance process of injunctive norms in loose cultures. In the broader context of research on resistance to persuasion, psychological reactance (Brehm, 1966) has been offered as one cause for the "boomerang" effect. Therefore, in Study 3, I tested the mechanism between normative influences and behavior change by examining the mediating role of psychological reactance. More specially, I adapted Dillard and Shen (2005)'s intertwined Process Cognitive-affective Model in communication research, where they conceptualized psychological reactance as the negative cognitions and affect resulting from a threat to one's freedom. I incorporated the bicultural component into the intertwined model in which injunctive norms negatively affect behavioral intentions as mediated by reactance, but this effect is moderated by the cultural context such that injunctive norm elicits higher perceived threat to freedom in looser cultures (see Figure 3).

Figure 3. Intertwined moderated path model



Method

Participants. A power analysis was conducted to determine the sample size necessary to examine the proposed effects (Cohen, 1988). In order to achieve an effect size of .25, with an alpha of .05, and power of .80, 418 participants were needed from the United States and mainland China separately (209 Americans and 209 Chinese). In total, 476 participants were recruited from the United States and China (239 Americans and 237 Chinese). Both the U.S. participants (U.S. citizens living in the U.S.) and Chinese participants (Chinese citizens living in mainland China) were recruited from Qualtrics Panels with quotas on sex, and age groups (over 18 years old). Participants were compensated through Qualtrics for participation. After the completion of the experiment, participants were fully debriefed.

Procedure. A computer-based experiment was conducted in the current study, in which data were collected online. U.S. participants completed a survey in English and Chinese participants completed the survey in Mandarin Chinese. All survey materials were developed by a team of two Chinese–English bilinguals. They were

translated and back-translated between the two languages. Both English and Chinese versions of questionnaires were carefully checked and

compared and edited to help maximize conceptual equivalence (Brislin, 1970).

Members of the panel were invited to participate in this study by giving a URL and required to log into the study from an Internet-connected computer. Upon arriving at the study webpage, participants were instructed to complete the informed consent. After the consent procedure, participants were asked to provide their opinion on a health-related message poster. (see Appendix E). Noticeably, the message differed in topics: drink more water versus drink less sugary drink. These two topics were chosen to capture a variety of differences and thereby increase the generalizability of the results. Specifically, one message promoted a healthy behavior (i.e., drink more water), while the other advocated reducing an unhealthy behavior (i.e., drink less sugary drink). Participants were randomly assigned to one of four conditions: 1) injunctive norm x drink more water condition, 2) descriptive norm x drink more water condition, 3) injunctive norm x drink less sugary drink condition, and 4) descriptive norm x drink less sugary drink condition).

Message Design.

	Injunctive norm	Descriptive norm
Topic 1: drink more water	82% of survey respondents thought you should drink 8 glasses of water per day.	82% of survey respondents reported drinking 8 glasses of water per day.
Topic 2: drink less sugary drink	82% of survey respondents thought you should not drink sugary drinks on a daily basis.	82% of survey respondents reported they did not drink sugary drinks on a daily basis.

Measures. *Induction check.* Perceived threat to freedom was measured by four items that were used in Dillard and Shen's study (2005): "The message threatened my

freedom to choose," "The message tried to make a decision for me," "The message tried to manipulate me," and "The message tried to pressure me." Participants were presented with a 7-point response scale in which 1 = strongly disagree, 7= strongly agree. This scale was reliable across all four messages and two countries (α_{us} = .91, α_{cn} = .93).

Anger. Anger was measured using five items that was adapted from previous studies (Dillard, Plotnick, Godbold, Freimuth, & Edgar, 1996; Dillard & Shen, 2005; Rains, & Turner, 2007): irritated, angry, annoyed, aggravated, and happy. The final item was reverse scored. The 5-point response scale was anchored at 0 = none of this feeling and 4 = a great deal of this feeling. This scale was reliable across all four messages and two countries (α_{us} = .75, α_{cn} = .76).

Cognitive response. Participants were asked to list whatever was in their minds when they finish reading the message poster. Following the thought-listing task, participants were instructed to review the thoughts they had listed and categorized them into 1) supportive thoughts: thoughts that expressed agreement with the message, and positive thoughts toward the message and the message source; and intention to comply with the message, 2) negative thoughts: thoughts that expressed disagreement with the message, intention to engage in the behavior that is opposite to the message, derogations of the source, or 3) irrelevant thoughts: thoughts that are not relevant to the message or not evaluative responses to the message (adapted from Rains & Tuner (2007)). The total number of negative thoughts represented the negative cognition measure. Because participants coded their own thoughts, it was not possible to compute a reliability coefficient for this measure.

Attitude. Attitude toward the message topic was assessed using a 7-point semantic differential attitude scale adapted from Dillard and Shen (2005), asking participants' attitudes towards the message advocacy (i.e., "Drinking sugary drinks daily is" and "Drinking at least 8 glasses of water per day is"). The word pairs used were: bad/good, foolish/wise, unfavorable/favorable, negative/positive, undesirable/desirable, and unnecessary/necessary. Participants responded on a 6-point scale ranging from 1 (strongly disagree) to 6 (strongly agree). This scale was reliable across all four messages and two countries (α_{us} = .98, α_{cn} = .97).

Behavioral intent in the future. Adapted from Dillard and Shen (2005), behavioral intention was measured by a 7-point single item estimate of the likelihood that participants would increase their water intake/decrease their sugary drink intake in the coming week.

Cultural tightness-looseness. Cultural tightness-looseness. Cultural tightness-looseness were measured with a reduced 11-item scale adapted from in study 1 (Gelfand et al. (2011). This scale was reliable across two countries (α_{us} = .83, α_{cn} = .73). Chinese participants scored significantly higher on the cultural tightness scale (M = 4.71) compared to American participants (M = 4.47), t=3.37, p=0.001).

Demographics. Age, sex, income, educational level, and religiosity were measured. In this study, Chinese participants had higher income (t=2.45, p<0.05), were younger (t=-10.34, p<0.001), less educated, (t=-3.09, p<0.005), and less religious (t=-10.12, p<0.001) than American participants (see Table 3 for means and standard deviations for all demographic measures).

Table 3. Means and standard deviations of demographic measures of study 3

	Age		Income level		Educational level		Religiosity	
	US	**CN**	**US**	**CN**	**US**	**CN**	**US**	**CN**
Mean	51	38	2.85	3.03	4	3.61	3.92	2.05
SD	16.24	11.14	0.89	0.63	1.61	1.12	2.08	1.95

Results

Table 4 and 5 presents the zero-order correlations, means, and standard deviations of all measures for the US sample and Chinese sample, respectively. Independent sample T-test was performed to compare these measures between two cultures. The results showed that, on average, Chinese perceived higher threat to freedom $t=3.99$, $p<0.00$, have lower negatively cognition, $t=11.08$, $p<0.001$, and higher behavior intention, $t=7.10$, $p<0.001$, compare to Americans. Two-way ANOVAs were also performed on these measures using a 2 (culture: China vs. the United States) x 3 (norm type: control, descriptive norm, injunctive norm) design. No significant interactions were detected (These analyses are provided in Appendix F).

Table 4. Zero-order correlations, means, and standard deviations of all measures for the US sample

	Mean	**SD**	**1**	**2**	**3**	**4**	**5**	**6**
1.Threat to freedom	2.62	1.63	1					
2. Anger	0.83	0.69	.46**	1				
3. Negative Cognition	1.90	2.12	.24**	.25**	1			
4. Attitude	4.23	2.25	-0.05	-0.07	-.16*	1		
5. Behavioral intent	4.69	1.85	-.18**	-.16*	-.43**	0.11	1	
6. Cultural tightness	3.84	0.75	.16*	0.08	-.16*	0.12	.23**	1

Table 5. Zero-order correlations, means, and standard deviations of all measures for the Chinese sample

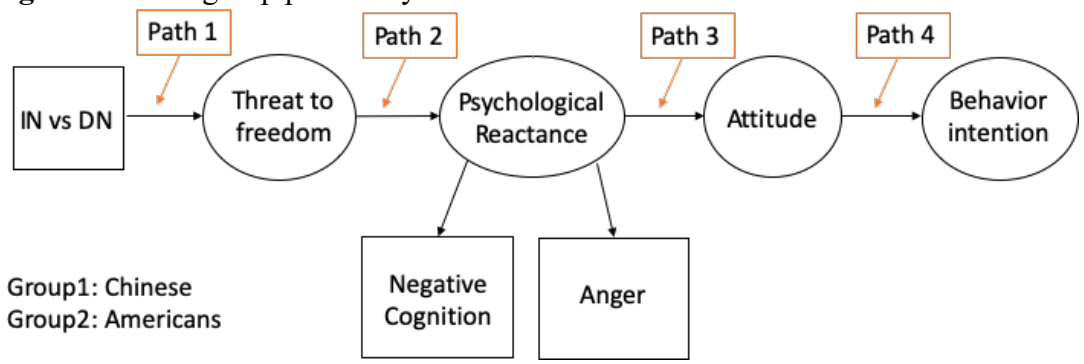
	Mean	SD	1	2	3	4	5	6
1.Threat to freedom	3.27	1.88	1					
2. Anger	0.74	0.72	.38**	1				
3. Negative Cognition	0.25	0.87	0.10	0.01	1			
4. Attitude	4.51	2.02	.25**	0.08	-0.02	1		
5. Behavioral intent	5.71	1.22	.09	-0.06	-.13*	.18**	1	
6. Cultural tightness	4.05	0.36	.07	-0.01	0.02	-0.08	-0.02	1

To examine the moderation effect of culture (China versus America), multigroup structure equation modeling was used to compare latent path models across two groups (see Figure 4). Mplus (Muthén & Muthén, 2012) was used to conduct all analyses. The following control variables were added: age, income level, educational level, and religiosity. Overall, the addition of the control variables did not alter the results in any way, and so I do not report them further. All variables were treated as latent constructs, and the measurement path for behavior intention was set at 1.00. The models were evaluated on two criteria: overall fit and significance of the path coefficients.

Based on the proposed moderated latent path model, I needed to test whether there was a significant difference in responding to two types of norms between the two cultures. That is, I first needed to demonstrate that the corresponding path parameters of norm type and threat to freedom (i.e., Path 1 of Figure 4) were different between the two cultures (i.e., Chinese and Americans) in my sample. I first constructed a fully constrained path model where I constrained all path parameters to be equal across groups. I also constructed a partially constrained path model where I set the parameters of Path 2-4 to be equal across groups, but I released the constraint of Path 1 parameter to vary across groups. I then compared χ^2s of the fully

constrained path model (χ^2= 532.5, df=172) with the partially constrained path model (χ^2= 531.05, df=171). The results showed that there is no difference in model fit between the fully constrained path model and the partially constrained path model, p=0.22. That is, no evidence to show that the path parameters of norm type and threat to freedom are different between Chinese and Americans.

Figure 4. Multi-group path analyses



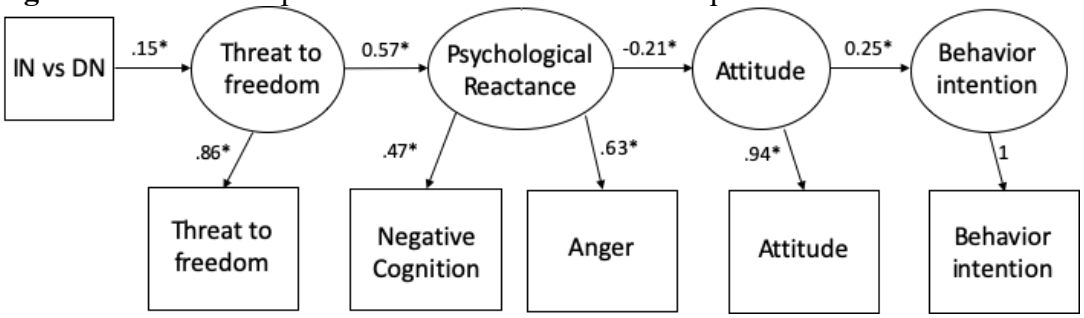
I proceeded to test whether the path model was tenable for each culture simultaneously. I constructed an unconstrained path model where I let all path parameters vary across groups. The model fit of the unconstrained path model (χ^2= 500.6, df=168) is significantly better compared to the fully constrained path model (χ^2= 532.5, df=172), p<0.001. That is, the structure of how variables were related in the model differ across cultures. The unstandardized model results showed that all paths for Americans are significant but none of the paths for Chinese are significant (See Table 6).

Table 6. Comparing unstandardized path coefficients between two groups (*p<=0.05)

	Chinese' Path		Americans' Path	
	Unstandardized Coefficients	Two-Tailed P Value	Unstandardized Coefficients	Two-Tailed P Value
Path 1: Norm type → Threat to Freedom	0.102	0.615	0.382	0.03*
Path 2: Threat to Freedom → Reactance	0.029	0.139	0.136	0.04*
Path 3: Reactance → Attitude	12.34	0.176	-1.56	0.05*
Path 4: Attitude → Behavior Intention	0.102	0.069	0.221	<0.001*

According to the unconstrained path model, all paths for the American group were significant and the standardized path coefficients from the SEM analyses are shown in Figure 5. As expected, compared to descriptive norm, injunctive norm elicited higher perceived threat to freedom ($\beta = 0.15$, $p < 0.05$); higher perceived threat was associated with higher psychological reactance ($\beta = 0.57$, $p = 0.001$); psychological reactance was negatively associated with participants' attitudes towards the advocated behavior ($\beta = -0.21$, $p < 0.05$), and we observed lower behavior intention among American participants ($\beta = 0.25$, $p < 0.001$). On the other hand, none of the paths for the Chinese group were significant.

Figure 5. Intertwined path model for the American sample



Discussion

Injunctive norm messages sometimes have little effect on behavior change, or even at the risk of producing *boomerang effect*. Several studies have proposed the idea that injunctive norm could stimulate reactance against the norm and decrease the extent of its influence (e.g., Mollen et al., 2013; Stok, 2014; Stok et al., 2014; White & Simpson, 2013). I believe that this study is the first to experimentally demonstrate an effect for injunctive norm on reactance itself, that is, the combination of negative cognition and anger.

Adapting Dillard and Shen (2005)'s intertwined path model, I examined the moderation effect of culture on the relationship between norm types and reactance. The model proposed there was a difference in responding to two types of norms between Chinese and Americans. Multigroup analysis demonstrated that compared to the fully constrained model, releasing the constraint between norm type and threat to freedom (i.e., path 1 coefficient) did not improve the model. That is, culture did not moderate the relationship between the norm type and how individual react to different norms.

The unconstrained path model improved the overall model fit compared to the fully constrained model as well as the partially constraint model. Therefore, it is worthy of interpreting the results. The unconstrained path model showed that among American participants, compared to the descriptive norm message, the injunctive norm message enhanced the strength of the threat to freedom and elicited psychological reactance, which in turn affect attitude and behavior intention. The results provided evidence that psychological reactance contributed to injunctive

norm's "boomerang" effect. The unconstraint path model also showed non-significant paths for Chinese sample. This could be due to measurement errors across cultures. Specifically, Dillard and Shen's intertwined model of reactance has only been verified using American samples. It is likely that the model might not accurately capture the psychological reactance process among Chinese sample, which is an important direction for future research.

Chapter 8: Study 4- Mitigating the Constraint in Injunctive Norms

Study 3 showed evidence that the injunctive norm heightened perceived threat to freedom and stimulated psychological reactance, that in turns affected behavior intention in loose cultures. In this study, I aimed to investigate how different framings of injunctive norm messages might reduce reactance and enhance the susceptibility to normative impact in loose cultures. More specifically, in order to minimize perceived threat to freedom, I tested whether avoiding coercive and controlling language (e.g., "should" or "approve/disapprove") in injunctive norm messages would decrease reactance in loose cultures.

This study examined the influence of normative appeals in a more naturalistic environment, which provided increased confidence in the ecological validity of this study. To test this, in April of 2019, an injunctive social norm campaign was implemented to promote water conservation among 410 residents living in 14 fraternity chapters houses on the University of Maryland campus. It was hypothesized that residents might reduce their water usage during the social norm campaign compared to baseline. Further, residents might be more inclined to save water when they encounter injunctive norm messages that do not use coercive and controlling language than injunctive norm messages that use coercive and controlling language.

Method

Participants and procedure. On April 1st, 2019, a total number of eight-four campaign posters was put up in 14 fraternity houses on the University of Maryland

campus. The reason these houses were chosen because 1) the layout of each house was identical, including

identical four bathrooms per house, and a basement laundry room; and 2) the water meter readings systems of these houses were up to date. They provided accurate water utility readings and were accessible through the department of facilities management on campus.

By observing behaviors inside of the fraternity houses, four types of water conservation behaviors were identified: 1) cutting down shower time, 2) running the water less than 30 seconds before showering, 3) turning off faucet when brushing teeth/washing face/shaving, and 4) doing larger, less frequent loads of laundry. Social norm campaign posters were designed targeted on these specific behaviors.

The 14 houses were randomly assigned to receiving one of two types of campaign posters: 1) poster contains injunctive norm with coercive words, and 2) poster contains injunctive norm with non-coercive words. The layout of the houses are identical: for each house, four posters were placed in each bathroom, one poster was placed in the laundry room, and one poster was placed behind the main entrance (see Table 7 for the injunctive norm messages featured on the posters, see Appendix G for poster designs).

Table 7. Injunctive norm messages that featured on the posters

	Injunctive norm with coercive words	**Injunctive norm with non-coercive words**
Behavior 1: Showering time	82% of Terps think you should cut your shower time in half	82% of Terps suggest cutting your shower time in half
Behavior 2: running the	84% of Terps disapprove of letting the water run for more	84% of Terps support running the water for less than 30 seconds before showering

water before shower	than 30 seconds before showering	
Behavior 3: faucet usage	79% of Terps think it is wrong to leave the faucet running while brushing your teeth, shaving, and washing your face	79% of Terps recommend turning off the faucet while brushing your teeth, shaving, and washing your face
Behavior 4: laundry	91% of Terps approve of doing larger, less frequent loads of laundry	91% of Terps support doing larger, less frequent loads of laundry

Results

Data. I collected daily water utility data for each house via Department of Facilities Management at the University of Maryland. Data from April 1st to May 6th of 2019, that is, 5 weeks during the social norm campaign, were used as experimental condition data. Data from Jan 28th to Match 30th of 2019, that is, 8 weeks prior to the social norm campaign, were used as baseline condition data. Additional data from Feb 1st to April 30th of 2018, that is, the same calendar period from the previous year, were also included in the analysis as baseline condition data. By doing so, I increased the statistical power and obtained a more accurate estimate of the daily water usage baseline. I excluded spring break data, that is March 17 to 25th of 2018, and March 16 to 24th of 2019, because of low occupancy. One house had frequent meter reading failure was also excluded from the analysis. This resulted in a total of 2158 observations (13 houses over 166 days) were included in the analysis.

Analysis. I first examined the mean differences in daily water usage between baseline condition and experimental condition (i.e., two injunctive norm conditions combined). I dummy-coded baseline and experimental condition dates (baseline condition = 0, experimental condition = 1) and tested the main effect of the

experimental condition, with controlling for occupancy per house, house renovation (i.e., whether the house is recently renovated), and gender (i.e., whether the house is occupied by female or male residents). To maximize statistical power, I modeled water usage with a mixed-effects model examining all 2,158 observations, allowing the estimation of random variance from each house, each day, each month, and whether it is a weekend. I used the *lme4* package (Bates et al., 2014) for the R software environment (R Core Team, 2019) to implement mixed-effects models and the R function *confint* to implement Wald tests to calculate 95% CIs. As predicted, on average, experimental condition used 82.9 gal less water per day than baseline condition ($t = -3.296$, $p < 0.005$, 95% CI for the difference in means = [-132.2, -34.6]). The results indicated that the social norm campaign successfully reduced water usage among the residents living in the fraternity houses.

I then examined the mean differences in daily water usage between baseline, injunctive norm with coercive words condition, and injunctive norm with non-coercive words condition. I fit a mixed-effects model with same random structure and control variables. The results showed that on average, houses in the injunctive norm with coercive words condition used 136.81 gal less water per day than the injunctive norm without coercive words condition ($t = - 4.15$, $p < 0.001$, 95% CI for the difference in means = [-201.38, -72.23]). Additionally, houses in the injunctive norm with coercive words condition used 146.09 gal less water per day than control condition ($t = -4.97$, $p < 0.001$, 95% CI for the difference in means = [-203.71, -88.46]).

There was no difference between injunctive norm with non-coercive words condition and control conditions (t=-0.302, p=0.76, 95% CI for the difference in means = [-69.61, 51.04]).

Additional analysis was conducted to explore how injunctive norm messages affect behavior over time. Growth modeling was used to analyze the data (Bliese & Ployhart, 2002). I first examined the estimate of the linear effect of time (unit: day) using same mixed effects model with same random structure and control variables. The results show that time negatively predicted water usage with controlling for occupancy per house, house renovation, and gender. That is, since the posters with injunctive norm messages were placed in the houses, water usage decreased over time. I further explored whether individuals responded to two different framing of injunctive norm messages differently over time. Using the same mixed effect model, I examined the interaction between two injunctive norm conditions and time on water usage. However, I did not find significant interaction, p=0.15. Moreover, rather than a linear relationship, I inspected whether time have a more complex relationship that interacted with two injunctive norm conditions which predict water usage. For instance, it is possible that when people first see injunctive norm with coercive language posters, they feel threatened and the water usage may increase, but over time water usage may decrease after the initial reactance. Therefore, I examined the interaction between condition and quadratic time on water usage. However, the interaction was not significant, p=0.36.

Discussion

This study investigated how different framings of injunctive norm messages might reduce reactance and in turn, motivate behavior change. More specifically, I hypothesized that exposure to injunctive norm without coercive language might be more effective in influencing behavior than injunctive norm with coercive language. However, the results of this field study indicated that, in fact, injunctive norm with coercive language fostered a significant behavior change compare to injunctive norm without coercive language condition as well as compare to baseline condition. There was no difference between injunctive norm with non-coercive words condition and control conditions.

The findings did not provide evidence for my hypothesis, albeit are worth noting. The effectiveness of one-time exposure of injunctive norm message might be different than multiple exposure over time. It was likely that one-time exposure to explicit injunctive norm messages elicits psychological reactance, but the reactance dissipated after multiple exposure over time. Study 1 - 3 measured psychological reactance or behavior intention/behavior right after a participant was exposed to a one-time injunctive norm message. In this study, the posters with injunctive norm messages were placed in the house for 5 weeks and participants were exposed to the message a few times a day, which could develop immunity towards the reactance over time.

Chapter 9: General Discussion

To expand our understanding of the underlying cultural mechanisms of normative social influence, the present research employed a set of three experiments and a field study that examined the effectiveness of injunctive versus descriptive social norms in a cross-cultural context. I hypothesized that (1) the two norms would influence behavior intentions and behavior differently across tight and loose cultures (2) the two norms would stimulate different degrees of psychological reactance across cultures; and (3) different framings of injunctive norm messages could alter the level of susceptibility to normative impact in loose cultures. The results of four studies partially supported these hypotheses, providing some evidence that that normative appeals differentially affected behavior change across cultures (see Appendix H for a summary table of study 1-4 results).

Study 1 tested the contention that two norms may influence behavior intention differently across tight and loose cultures. The results demonstrated that both injunctive norm and descriptive norm messages were more effective than the control messages in influencing helping intentions among Chinese participants. However, these different types of social norms did not increase helping intentions among American participants compared to control conditions. Study 2 measured behavior responses to the two types of norms across cultures. The results provided evidence that normative appeals differentially affected behavior across tight and loose cultures. Specifically, in the U.S., injunctive norm appeals showed a boomerang effect, whereby exposure to injunctive norm messages decreased, rather than increased, the amount of donations compared to control messages. By contrast, in China, descriptive

norm messages were more effective in influencing donations than the control condition. Similarly, injunctive norm messages were marginally more effective in influencing donations than the control.

Study 3 aimed to explore the psychological reactance process of injunctive norms in loose cultures and provide an explanation of injunctive norms' boomerang effect. Indeed, I found, among Americans, compare to descriptive norm messages, injunctive norm messages enhanced the strength of the threat to freedom and elicited psychological reactance, which in turn decreased their intention to follow the advocated behavior. However, Chinese did not follow the same psychological patterns as Americans. Additional analysis showed that among Chinese participants, there is no mean difference in perceived threat to freedom between injunctive norm and descriptive norm condition. On the other hand, American participants exposed to injunctive norm messages perceived significantly stronger threat to freedom than those who exposed to descriptive norm. These analyses indicated that, as expected, Americans perceived higher threat to freedom in injunctive norm condition compared to descriptive norm condition, whereas Chinese participants exhibited no difference in perceived threat to freedom between the two types of social norms. The results demonstrated that there may be cross-cultural differences in psychological responses to two types of norms.

Study 4 investigated how different framings of injunctive norm messages might reduce reactance and enhance the effectiveness of injunctive norm persuasion. I hypothesized that avoiding coercive language (e.g., "should" or "approve/disapprove") in injunctive norm messages would decrease reactance and in

turn, increase the engagement of advocated behavior in loose cultures. However, to my surprise, the results showed that injunctive norm messages with coercive language fostered a significant behavior change compare to injunctive norm without coercive language condition or the baseline condition.

There were a number of strengths to the current research. This study is one of the few studies that examined the effectiveness of injunctive norm and descriptive norm messages across cultures. Using multiple measures, our finding illuminates a variety of responses (i.e., behavior intention, behavior, psychological reactance) to social norm messages, while the structural equation modelling of the data added valuable insights regarding factors that may mediate effects. The mixed methods approach, including three cross-cultures experiments and a field study, allowed me to begin to examine the influences of injunctive norms and descriptive norms and draw potential causal inferences about the effects of normative influences on individuals from different cultures. Fourth, I piloted the studies extensively and addressed the comments for both English and Chinese versions of questionnaires to maximize conceptual equivalence (Brislin, 1970).

It is also worth noting some of the limitations of this research, which need to be addressed in future research. First, the first three studies used online convenience sampling. Albeit it is cost-effective, it has risk of sampling error, which may contribute to insufficient power and type II errors. Noticeably, study 1 and study 2 did not provide consistent answers to my injunctive norm hypotheses regarding loose cultures. Study 2's results show a boomerang effect of injunctive norms in the US sample but study 1 did not. The inconsistency may because these two studies were

drawn from different demographics in the United States. Study 2's results were drawn from a college student sample with shared experiences and educational background. The participants from study 1, on the other hand, were recruited via Qualtrics panel with members from different professions and educational backgrounds. Given a relatively small sample (n=155), the "noise" in the sample may be too large to detect the difference in their response to different social norm messages. Further, there was a significant age gap between the two American samples. The mean age of study 1 is 51 years old, whereas the mean age of study 2 is 21 years old. It may be that younger people are more likely to display reactance towards injunctive norm messages.

Secondly, I did not find evidence to support cross-cultural differences in psychological reactance process of injunctive norms in study 3. That is, there was no evidence that there is a moderation effect of culture (Chinese vs. Americans) on how individuals were affected by different social norms. The non-significant moderation effect could likely be due to measurement errors. More specifically, the intertwined path model of psychological reactance I adapted from Dillard and Shen (2005) has only been tested and validated using American samples, but the reactance processes may be different for Chinese. It is possible that Chinese undergo a different psychological process with respect to different normative influences, which may not be addressed using the current intertwined path model. Future research needs to examine the underlying psychological mechanism that could explain how the Chinese process different social norm information. There may be a stronger cognitive congruency among Chinese when they process injunctive norms versus descriptive norms. The results of study 1-3 consistently confirmed the notion. Chinese showed no

difference in behavior intention, behavior or perceived threat to freedom when they were exposed to injunctive norm or descriptive norm messages.

Another limitation is that the results of the field study did not seem to fit my contention that explicit injunctive norms elicit psychological reactance. However, the findings draw attention to the possible differences in behavioral outcomes between one single exposure of normative messages versus multiple exposures over time. Unlike study 1-3, in the field study, injunctive norm posters were placed in the bathrooms, main entrance, as well as the laundry room for over 4 weeks. Most residents go to the bathroom between 4-8 times per day and thus were likely to see the signs multiple times a day. It is possible that psychological reactance may be dissipated after multiple exposures over time and in turn increase engagement of advocated behavior. Future studies need to address the relationship between time and psychological reactance in response to injunctive norm messages. Moreover, it is important to note that the residents who participated in the field study all belong to either fraternities or sororities. Ironically, fraternity and sorority cultures may have tight cultures, especially for the members who live in the 14 chapter houses I sampled. There were numbers of rules and expectations to follow and if members fail to meet the expectations, the punishment can be severe (e.g., no social events for one semester or one academic year on or off campus) (Chapter Expectations Policy, 2018). Moreover, there is a lot of mutual monitoring in the close quarters of the houses in public spaces like bathrooms. As members started to change their behavior to reduce their water consumption, it would be obvious when others were not doing so, which could result in peer pressure to change one's behavior. If this is the case,

the results of the field study would support my theory where in tighter society explicit injunctive norm are more effective in influencing people's behavior. Future research needs to explore this possibility by explicitly measure perceived tightness-looseness.

It is worth noting how injunctive and descriptive norm messages were operationalized throughout the studies. To date, social norm researchers have not reached a consensus on how to phrase injunctive or descriptive norm messages. In current research, when designing social norm messages, I strived to achieve the following: 1) adhere to the conceptualization of injunctive and descriptive norms; 2) keep the formalities of these two types of social norm messages consistent with previous research; 3) take into account that the English versions of the normative messages have the potential to be translated in Chinese in a way that maximizes the conceptual equivalence; 4) keep the message concise and comprehensible for the participants. Noticeably, the phrasing of injunctive norms throughout the 4 studies differs slightly. For instance, in study 1 and study 2, I adapted the language that was used in Jacobson and colleagues' 2015 study, where injunctive norm messages were phrased as, "participants thought you should be willing to …" For study 3, I sought to express injunctive norms in both a promotion and a prevention manner. To avoid a convoluted phrasing, however, it was necessary to modify the language -- removing "be willing to" from the message -- while staying true to the original concept of injunctive norms. As such, the injunctive norm messages were phrased as "respondents thought you should …" (promotion) and "respondents thought you should not…" (prevention). Future research would benefit from a meta-analysis of

how different framing of injunctive and descriptive norms would affect behavior and behavior intention differently.

From a theoretical perspective, the current study makes a number of contributions, most notably to the cross-cultural psychology literature and the social norm literature. To date, theory and research on social norm influences have been largely a Western enterprise, neglecting the vast array of differences we see across human groups around the globe. More specifically, previous research on the effectiveness of injunctive and descriptive norms has often been conducted in Western cultural contexts. To my knowledge, this is one of the few works to systematically examine the influences of injunctive norms and descriptive norms on behavior intention and behavior across cultures. This research contributes to the social norm literature by suggesting that in loose cultures, exposure to injunctive norm messages discourage, rather than encourage donation behavior compared to control messages. On the other hand, in tight cultures, both descriptive norm and injunctive norm messages were more effective in influencing donation behavior than the control condition.

The current study begins to bridge the gap between the social norm and psychological reactance theory literature. Several studies have proposed the idea that injunctive norm could stimulate reactance against the norm and decrease the extent of its influence (e.g., Mollen et al., 2013; Stok, 2014; Stok et al., 2014; White & Simpson, 2013). I believe that this study is one the of the first to experimentally demonstrate an effect for injunctive norms on reactance itself, that is, the combination of negative cognition and anger.

In addition to making a theoretical contribution, this research offered practical implications for marketing professionals and advertisers to better tailor their message-based marketing to different cultural contexts. It will also offer important insights to managers who rely on norms to regulate behaviors and performance of employees from multicultural teams. Furthermore, behavioral economists have begun to realize the important role that norm-based messages play in promoting behavior change. For policymakers, the finding offers valuable insights on how to increase the effectiveness of injunctive norm messages that could provide a low-cost way to reduce residential consumption levels.

This research also opens a few interesting directions. It may be interesting to explore, from a cross-cultural perspective, what motivates individuals to behave differently when exposed to different types of norms. Jacobson and his colleagues (2011) demonstrated differences in the norms' associations to the goals of making accurate/efficient decisions and gaining/maintaining social approval using American samples. The results indicate that gaining/maintaining social approval motivates individuals to adhere to injunctive norms, whereas making accurate/efficient decisions could be a driver for adherence to descriptive norms. It would be interesting to see whether people from other cultures also associate injunctive norms with gaining/maintaining social approval and descriptive norms with making accurate/efficient decisions. My study demonstrated that both injunctive and descriptive norms affect behavior among Chinese. It is likely that the Chinese may perceive injunctive norm information and descriptive norm information in a similar manner. They may link both injunctive norm and descriptive norm with

gaining/maintaining social approval. Indeed, an exploratory analysis from my study 1 demonstrated that Chinese can only correctly recall whether they were exposed to an injunctive norm or a descriptive norm message less than 30% of the time, whereas Americans can correctly recall 70% of the time. This preliminary result showed some evidence that Chinese often do not distinguish injunctive norm with descriptive norm information. Furthermore, it is also important to measure these motivation factors within cultures to examine why injunctive norms and descriptive norm may have different effects. For instance, fraternity members may experience a tighter culture within their fraternity and have stronger needs maintaining social approval compare to other university students. Therefore, the injunctive norm would work better among fraternity members than other university students. It is worth noting that future research should also pay attention to the reference group when phrase social norm messages. It is likely that an individual's susceptibility to social norm persuasion depends on the reference group that is mentioned in the social norm messages. For example, Peking University students may not be affected by what University of Maryland students think about what they should do.

It may be useful to replicate these experiments in other tight (e.g., Singapore) versus loose cultures (e.g., the New Zealand). This would also add more power to possibly establish tightness-looseness as a moderating role that effects the relationship between different social norms and behavior responses. It would also be valuable to explore the potential moderating roles of personality constructs such as felt accountability, self-regulation, which can enhance our understanding of the differences in perceived threat to freedom between injunctive and descriptive norms

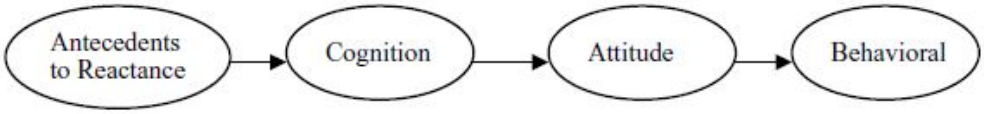
in loose cultures. Future research would also benefit from examining the effectiveness of injunctive norm over time in different cultural contexts. It is possible that the rate of behavior change over time in response to injunctive norms are different across cultures. In tight cultures, behavior change may taper off with time, whereas in loose cultures, behavior change may come slowly but persists for a longer time.

In conclusion, the integration of cross-cultural psychology and normative influences research constitutes an important frontier for theory, research, and practice.

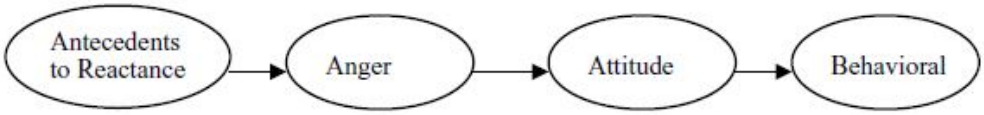
Appendices

Appendix A

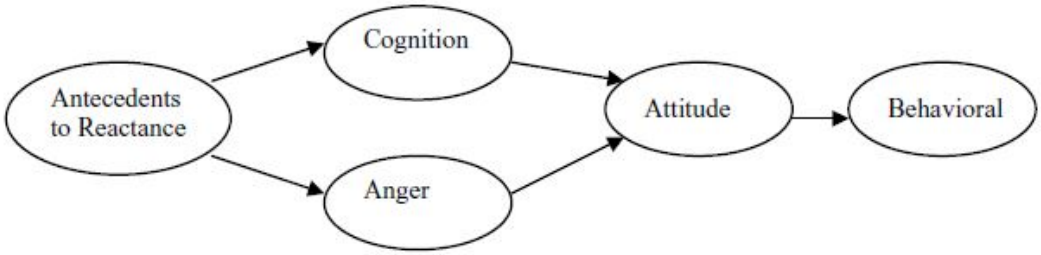
A Single Process Cognitive Model



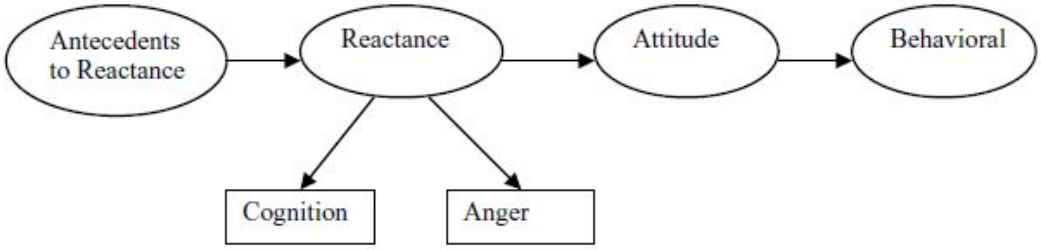
A Single Process Affective Model



A Dual Process Cognitive-affective Model



An Intertwined Process Cognitive-affective Model



Comparison of four models of reactance was presented in Dillard and Shen (2005)

Appendix B

Tightness-looseness scale

The following statements refer to United States/China as a whole. Please indicate whether you agree or disagree with the following statements using the following scale. Note that the statements sometimes refer to "social norms," which are standards for behavior that are generally unwritten.

1	2	3	4	5	6
Strongly Disagree	Disagree	Somewhat Disagree	Somewhat Agree	Agree	Strongly Agree

1. There are many social norms or standards that people are supposed to follow in the United States/China.

2. In the United States/China, there are very clear expectations for how people should act in most situations.

3. People agree upon what behaviors are appropriate in most situations in the United States/China.

4. People in the United States/China have a great deal of freedom in deciding how they want to behave in most situations.

5. In the United States/China, if someone acts in an inappropriate way, others will strongly disapprove.

6. People in the United States/China almost always comply with social norms or standards.

7. In the United States/China, there are clear rules for how one should behave.

8. In the United States/China, it is acceptable for people to display behavior that is inconsistent with social norms or standards.

9. In the United States/China, it is important to conform to expected behavior to avoid disapproval.

10. In the United States/China, there is little flexibility in how one should behave in most situations.

11. In the United States/China, there is strong agreement on what behavior is acceptable in most situations.

12. In the United States/China, it is necessary to conform to expected behavior.

13. In the United States/China, people have a lot of flexibility to behave as they wish.

14. For most situations in the United States/China, there is very little freedom to act as one prefers.

Please write a number in the blank to indicate your view about the current state of the United States from 1= very restricted to 7=very permissive

15. The United States/China is currently_____

Appendix C

Psychological needs for autonomy scale

Below, we are going to ask you about your experiences of certain feelings in your life. Please read each of the following items carefully. Using the below scale, please indicate the degree to which each statement is true for you.

1	2	3	4	5
Not true at all				Completely true

1. I feel a sense of choice and freedom in the things I undertake.
2. Most of the things that I do feel like "I have to."
3. I feel that my decisions reflect what I really want.
4. I feel forced to do many things I wouldn't choose to do.
5. I feel my choices express who I really am.
6. I feel pressured to do too many things.
7. I feel I have been doing what really interests me.
8. My daily activities feel like a chain of obligations.

Autonomy satisfaction: item # 1, 3, 5, 7

Autonomy frustration: item #2, 4, 6, 8

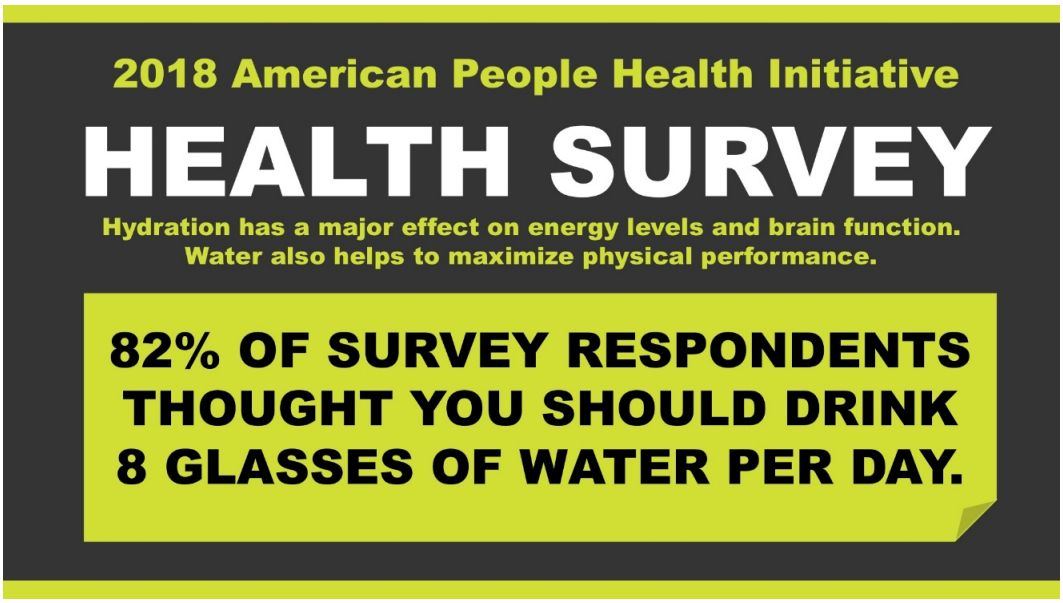
Appendix D

Charity poster (American)

Charity poster (Chinese)

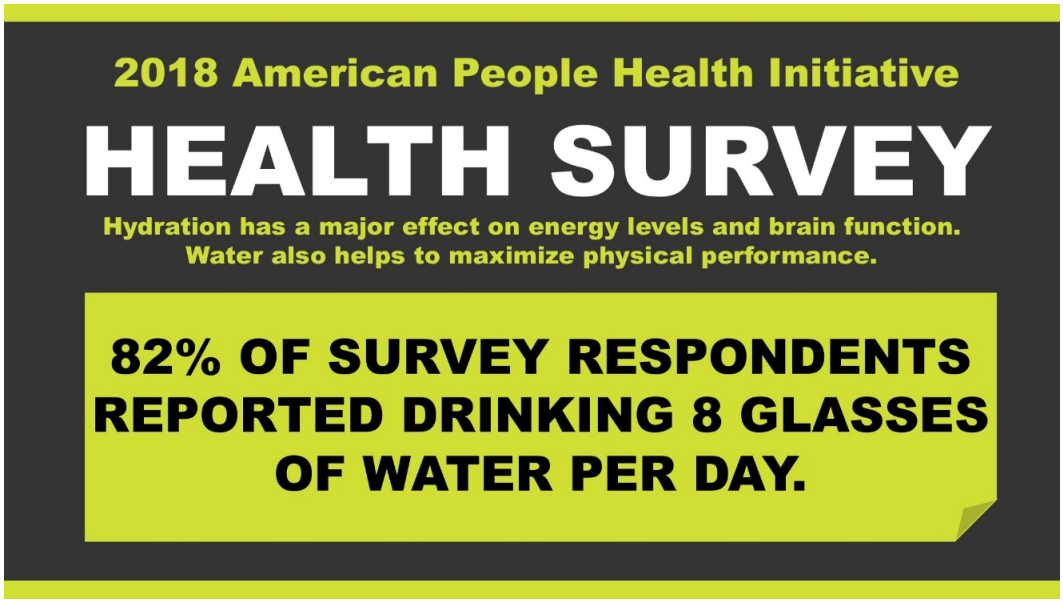
Appendix E

Injunctive norm: drink more water condition poster (American)



Injunctive norm: drink more water condition poster (Chinese)

Descriptive norm: drink more water condition poster (American)



Descriptive norm: drink more water condition poster (Chinese)

Injunctive norm: drink less sugary drink condition poster (American)

Injunctive norm: drink less sugary drink condition poster (Chinese)

Descriptive norm: drink less sugary drink condition poster (American)

Descriptive norm: drink less sugary drink condition poster (Chinese)

Appendix F

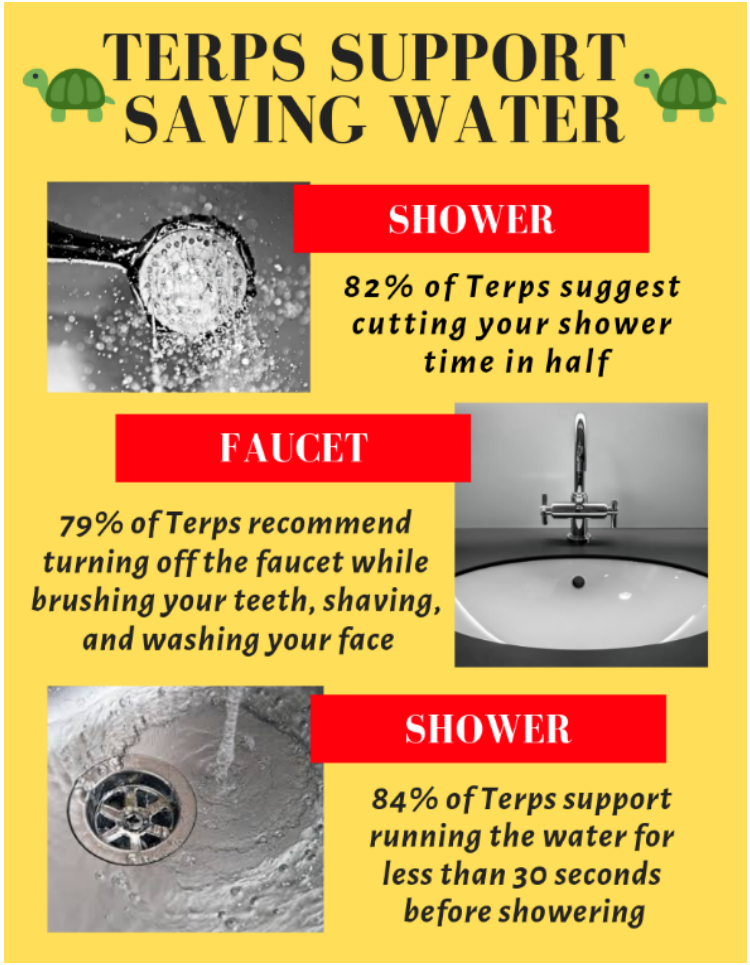
Table 8. The results of Two-way ANOVAs for study 3

	Dependent Variables									
	Threat to freedom		**Anger**		**Negative Cognition**		**Attitude**		**Behavioral intent**	
	F	Sig	F	Sig	F	Sig	F	Sig	F	Sig
Culture	16.03	<0.001	11.19	0.001	122.98	<0.001	2.11	0.15	50.15	<0.001
Condition	3.243	0.07	0.03	0.86	1.60	0.21	0.50	0.48	0.34	0.56
Culture*Condition	1.04	0.31	2.63	0.11	1.36	0.24	0.60	0.44	0.52	0.47

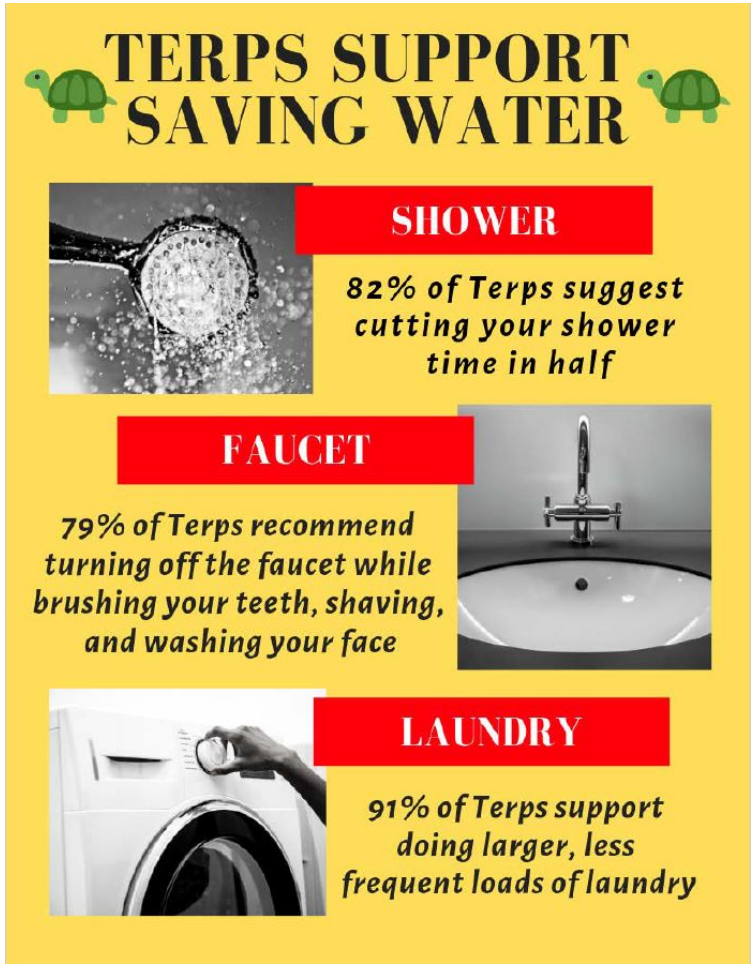
Note: The degrees of freedom of all F values' above is (1, 472)

Appendix G

Bathroom Posters: Poster contains injunctive norm with coercive words (left), and poster contains injunctive norm with non-coercive words (right)



Main Entrance posters: Poster contains injunctive norm with coercive words (left), and poster contains injunctive norm with non-coercive words (right)



Laundry room posters: Poster contains injunctive norm with coercive words (left), and poster contains injunctive norm with non-coercive words (right)

Appendix H

Table 9. Study 1-4 results summary

	Hypothesis	Summary of Main Results
Study 1	**H1a**: In loose cultures, injunctive norms are less effective in influencing behavior intentions compared to descriptive norms **H1b**: In tight cultures, there is no difference in influencing behavior intentions between injunctive norms and descriptive norms.	- Two-way ANOVA results showed no significant interactions between culture and social norm type on behavior intention, which indicated there were no cross-cultural differences in behavior intention when exposed to different social norms. - Chinese were willing to answer more surveys when they were exposed to injunctive norm or descriptive norm compared to control condition. There were no significant differences in Chinese's behavior intention between the descriptive norms and injunctive norm condition. - Among Americans, there is no evidence that control, injunctive norm, and descriptive norm messages affect behavior intentions differently.
Study 2	**H2a:** in loose cultures, injunctive norms are less effective in influencing behavior compared to descriptive norms and in tight cultures **H2b:** there is no difference in influencing behavior between injunctive normative and descriptive normative norms	- Two-way ANOVA results showed significant interaction between culture and social norm type on behavior, which indicates there were cross-cultural differences in donation behavior in responding to different types of social norms. - Chinese donated more money when they were exposed to descriptive norm compared to control. They also donated more money when they were exposed to injunctive norm compared to control, but the effect was only marginally significant. There were no significant differences in donation behavior between injunctive norm and descriptive norm condition among Chinese. - Americans donated less money when they were exposed to injunctive norm messages compared to control. There were no significant differences in donation behavior between descriptive norm and control condition, or between descriptive norm and injunctive norm condition.

Study 3	**H3a:** compared to descriptive norms, injunctive norms are less likely to affect behavioral change as mediated by reactance; **H3b:** this is moderated by the cultural context such that reactance is much stronger in loose than tight cultures.	- Multigroup analysis did not find moderation effect of culture on the relationship between norm types and reactance. - Among Americans, compared to descriptive norm condition, the injunctive norm message enhanced the strength of the threat to freedom and elicited psychological reactance, which in turn affect attitude and behavior intention. - There is no evidence that Chinese followed the mediated path model where compare to descriptive norm, injunctive norms are likely to affect behavioral change as mediated by reactance.
Study 4	**H4:** IN messages that do not use coercive words work better in influencing behavior change in a loose culture compared to IN messages that use coercive words	- On average, houses in the injunctive norm with coercive words condition used 136.81 gal less water per day than the injunctive norm without coercive words condition. - House in the injunctive norm with coercive words condition used 146.09 gal less water per day than control condition. There was no difference in daily water usage between injunctive norm with non-coercive words condition and control conditions.

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