

## **Examining a Climatoeconomic Contextualization of Generalized Social Trust Mediated by Uncertainty Avoidance**

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# Examining a Climateconomic Contextualization of Generalized Social Trust Mediated by Uncertainty Avoidance

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## Abstract

Social science research has focused on polieconomic factors for generalized social trust. Yet psychological research has shown that ecological factors can influence cognition, mood, and behavior. Following Van de Vliert's climatic demands-resources theory, I proposed the view of a climateeconomic contextualization of generalized social trust. Specifically, I found that the interplay of thermal climates (harshness) and wealth (GDP per capita) was related to generalized social trust, mediated by uncertainty avoidance rather than other cultural dimensions such as individualism-collectivism, masculinity-femininity, and power distance. These findings render direct support to Hofstede's hypothesis that societal cultures are first-stage outcomes of climatic factors and second-stage intermediaries between these climatic factors and the sociopsychological functioning of markets, organizations, groups, and individuals. They also provide important implications for trust theory and climatic demands-resources theory.

## Keywords

trust, thermal climate, wealth, culture, uncertainty avoidance

Various disciplines deem trust—the willingness to accept vulnerability to the actions of others based on positive expectations of others' intentions or behavior (Rousseau, Sitkin, Burt, & Camerer, 1998)—as an important concept that contributes to economic and relational behavior (Berg, Dickhaut, & McCabe, 1995; Colquitt, LePine, Piccolo, Zapata, & Rich, 2012; Colquitt, Scott, & LePine, 2007; Dirks & Ferrin, 2001, 2002; Kramer, 1999; Kramer & Lewicki, 2010; Lewicki, Tomlinson, & Gillespie, 2006; Mayer, David, & Schoorman, 1995; McEvily, Perrone, & Zaheer, 2003; Zaheer, McEvily, & Perrone, 1998). Trust has been extensively examined within the framework of social exchange theory (Aryee, Budhwar, & Chen, 2002; Blau, 1964; Colquitt et al., 2012; Cropanzano & Mitchell, 2005; Dirks & Ferrin, 2002; Frazier, Johnson,

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Gavin, Gooty, & Snow, 2010; Kong, Dirks, & Ferrin, 2012; Konovsky & Pugh, 1994; Lavelle, Rupp, & Brockner, 2007; McAllister, 1995; Whitener, Brodt, Korsgaard, & Wener, 1998). Social exchange theory can explain thick (particularized) social trust, which is targeted at a specific person and is based on familiarity and similarity in social interactions, but the theory has limited value in explaining thin (generalized) social trust, which does not involve specific interpersonal interactions or relationships (Uslaner, 2002; Zucker, 1986). Understanding the determinants of generalized social trust has important implications for public governance, economic transactions, organizational development, and interpersonal interactions. Social science research has largely focused on polieconomic factors (e.g., income equality) for generalized social trust (e.g., Bjørnskov, 2006). Yet psychological research has shown the significant impact of ecological factors (e.g., weather, thermal climates) on cognition, mood, and behavior (e.g., Cunningham, 1979; Keller et al., 2005; Van de Vliert, 2009). Do thermal-climatic factors, together with economic factors, have an impact on generalized social trust?

Van de Vliert and his colleagues (Van de Vliert, 2007a, 2011; Van de Vliert, Van der Vegt, & Janssen, 2009) found that prosocial-unselfish enculturation and collective self-expression were determined by the interplay of two objective environmental factors—thermal climates and wealth. This is aligned with Hofstede's (1980) hypothesis that societal cultures are first-stage consequences of climatic composites (see Van de Vliert, 2007a). In addition, societal cultures are second-stage intermediaries between climatic factors and their indirect consequences for the sociopsychological functioning of markets, organizations, groups, and individuals (Hofstede, 1980). A climatoeconomic interaction should contextualize generalized social trust, which is an important sociopsychological mechanism that guides economic transactions and social interactions at various levels (Nannestad, 2008). However, the second-stage mediating mechanism between a climatoeconomic interaction and generalized social trust remains unknown. It is important to empirically examine the mechanism given that societal cultures play a key role in the development of trust (Doney, Cannon, & Mullen, 1998).

The current research *directly* and *simultaneously* tests Hofstede's (1980) hypotheses as previously mentioned. Specifically, I address two related questions: Does a climatoeconomic interaction contextualize generalized social trust? If so, is uncertainty avoidance the adapted cultural dimension that serves as the second-stage intermediary between the climatoeconomic interaction and generalized social trust? Trust is closely related to risk-taking and is an outcome of individuals' perception and assessment of risks embedded in the environment (Berg et al., 1995; Coleman, 1990; Colquitt et al., 2007; Mayer et al., 1995; McEvily, 2011; Rousseau et al., 1998). Uncertainty avoidance—one of the cultural dimensions proposed by Hofstede (1983) that directly taps into general attitudes toward risk and uncertainty (versus other cultural dimensions such as individualism-collectivism, masculinity-femininity, power distance, and long-term orientation)—may serve as the mediating mechanism that explains how risk perception of the climatoeconomic environment is translated into generalized social trust.

## **Generalized Social Trust: The Sociopsychological Mechanism of Markets, Organizations, Groups, and Individuals**

Trust manifests in two major forms: social trust and institutional trust (Bachmann, 2011). Social trust is based on the perception of another person's or other people's characteristics (Mayer et al., 1995), whereas institutional trust is mainly based on the perception of an institution's performance (e.g., Hetherington, 2005) with no interpersonal interactions (Giddens, 1990). Social trust can further break down into two categories—particularized social trust and generalized social trust. Particularized social trust depends on familiarity and similarity between a trustor and a trustee, whereas generalized social trust depends on morality and a trustee's or a trust intermediary's

reputation (Khodyakov, 2007; Kong, in press; Putnam, 2000; Uslaner, 2002; Yamagishi, Kikuchi, & Kosugi, 1999; Yamagishi & Yamagishi, 1994; Zucker, 1986).

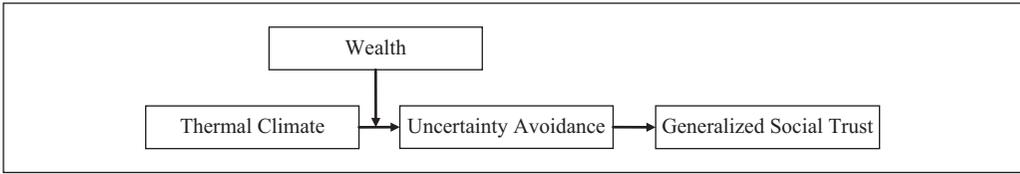
“Development and modernization require that the network of trust is extended to others outside of the traditional circle of family, neighbourhood, and village” (Realo, Allik, & Greenfield, 2008, p. 450). Generalized social trust plays a significant role in human societies. It is not a stable cultural trait but rather is determined by cultural values or norms transmitted through socialization processes (Axelrod, 1984; Gheorchium, Vignoles, & Smith, 2009; Klasing, 2011; Nannestad, 2008). It is “the bedrock of cooperation” (Nannestad, 2008, p. 428), mobilizing and coordinating actions in markets, organizations, and groups and guiding individuals’ decisions (Dirks & Ferrin, 2001; Gulati, 1995; McEvily et al., 2003; Zaheer et al., 1998; Zaheer & Venkatraman, 1995). Generalized social trust helps reduce collective action problems and transaction costs in principal-agent relationships (Nannestad, 2008). It also makes people approach and cooperate with others who have little history of interactions with them (Realo et al., 2008; Yamagishi, 1986) and facilitates the formation and maintenance of social networks (Gulati, Nohria, & Zaheer, 2000). Thus, generalized social trust is indispensable for connecting diverse social groups, encouraging civic engagement, and increasing economic development (Fukuyama, 1995; Nannestad, 2008; Uslaner, 2002; Uslaner & Brown, 2005).

## **A Climatoeconomic Contextualization of Generalized Social Trust**

Following models of stress (George & Zhou, 2002; Karasek, 1979; Lazarus & Folkman, 1984; Toplyn & Maguire, 1991) in which demands either impair or enhance sociopsychological functioning depending on the necessary resources to meet the demands, Van de Vliert (2007a, 2007b, 2009, 2011) proposed climatic demands-resources theory. According to the theory, great climatic demands matched by wealth-based resources enhance sociopsychological functioning, as this match makes individuals transform threats into opportunities, whereas great climatic demands not matched by wealth-based resources impair sociopsychological functioning, as this mismatch makes individuals concentrate on threats rather than opportunities (Fischer & Van de Vliert, 2011; Parsons, 2003; Van de Vliert, 2009).

Social surrogacy theory and embodied cognition theory both posit the hardwired, unconscious association between physical temperature and social “temperature” in that abstract psychological concepts are metaphorically grounded in concrete physical experience (Bargh & Shalev, in press; IJzerman & Semin, 2009; Troisi & Gabriel, 2011; Williams & Bargh, 2008; Zhong & Leonardelli, 2008). Harsh thermal climates can activate the motivation to seek psychological comfort such as romance (Hong & Sun, in press) or belonging (Troisi & Gabriel, 2011) with family, neighbors, coworkers, and others. Positive feelings and needs for social connections tend to facilitate interpersonal trust (Derfler-Rozin, Pillutla, & Thau, 2010; Dunn & Schweitzer, 2005). Individuals generalize from experiences with certain groups of people in developing their expectancies about how others will treat them or whether others can be trusted (Hardin, 2002; Stack, 1978). Therefore, generalized social trust is “the result of a wide-ranging summation of past experience in more localized domains,” according to the social learning perspective (Glanville & Paxton, 2007, p. 232). Individuals in harsh thermal climates tend to trust generalized others more than those in comfortable thermal climates.

Wealth-based resources can strengthen the relationship between thermal climates and generalized social trust. In harsh thermal climates, abundant wealth-based resources make individuals feel satisfied about fulfilling their thermal needs (Van de Vliert et al., 2009) and needs to protect themselves against the risk of trusting others without intimate knowledge (Hamamura, 2012; Simmel, 1950). Thus, they tend to perceive low risk of generalized social trust and have high



**Figure 1.** A Climateconomic Contextualization of Generalized Social Trust Mediated by Uncertainty Avoidance

generalized social trust. In contrast, when great climatic demands are not matched by wealth-based resources, individuals feel dissatisfied about not fulfilling their thermal needs or needs to protect themselves against the risk of trusting others without intimate knowledge. Thus, they tend to perceive high risk of generalized social trust and have low generalized social trust.

### Uncertainty Avoidance as the Mediating Cultural Dimension

Following Fischer and Van de Vliert's (2011) process model, I argue that thermal climates and wealth provide the ecological context in which individuals deal with environmental uncertainty. Uncertainty avoidance, as an important cultural dimension, reflects the degree to which individuals generally have psychological comfort about uncertain or uncontrollable situations at the societal level (Hofstede, 1980). It defines how individuals in a society are related to risk and has a bearing on trust at the societal level (Doney et al., 1998). Doney et al. (1998) proposed that Hofstede's cultural dimensions influenced the way individuals develop trust in others. Trust embodies societal cultures in that societal cultures influence the bases of trust (Ferrin & Gillespie, 2010). Individuals in high uncertainty-avoidance cultures generally are more threatened by environmental uncertainty, less willing to accept personal risk, and more aggressive than those in low uncertainty-avoidance cultures (Hofstede, 1980). Therefore, individuals in high uncertainty-avoidance cultures are less likely to take personal risk of trusting generalized others than those in low uncertainty-avoidance cultures.

Thermal climates and wealth are important determinants of uncertainty avoidance. Societies adapt cultural values to their climatic and economic environment (Van de Vliert, 2007b). Comfortable thermal climates do not impose great risk of difficult living conditions or scarce food resources, whereas harsh thermal climates require more resources (e.g., protective devices such as heating systems) to meet the basic need for thermal comfort. Therefore, environmental risk in harsh thermal climates is higher than that in comfortable thermal climates. The perceived risk is exacerbated by the inadequacy of wealth-based resources and the resultant inability to cope with environmental uncertainty. In contrast, when individuals have sufficient wealth-based resources, they feel empowered by the economic resources they possess, thus having an optimistic risk assessment and engaging in risky behavior (Anderson & Galinsky, 2006; Loewenstein, Weber, Hsee, & Welch, 2001; Sitkin & Weingart, 1995). The positive impact of wealth on risk perception looms large in societies with harsh thermal climates when resources are particularly important to meet the need for thermal comfort (Van de Vliert et al., 2009). Accordingly, I propose the following hypothesis (see Figure 1 for the hypothesized mediated moderation model).

*Hypothesis: At the societal level, the interaction of thermal climates (harshness) and wealth is positively related to generalized social trust, mediated by uncertainty avoidance.*

## Method

### Sample

I collected archival data from the World Values Survey (1981-2008) and various online sources (no common source bias). A total of 67 societies (218,385 individuals) were included in the sample. These societies were included because they had available data for the variables of interest.

### Measures

#### Dependent Variable

**Generalized social trust.** Individuals who responded to the World Values Survey question regarding generalized social trust (Inglehart, Basañez, Diez-Medrano, Halman, & Luijkx, 2004) made a dichotomous choice between “most people can be trusted” or “can’t be too careful.” Research has shown societal differences in generalized social trust (Ferrin & Gillespie, 2010). This measure is stable and reliable and has robust predictive value (e.g., Neville, in press). I used the percentage of those who chose “most people can be trusted” (e.g., Bjørnskov, 2006) as the index of generalized social trust, ranging between 0 and 100. A one-sample Kolmogorov-Smirnov test indicated that the index was normally distributed ( $p = .26$ ).<sup>1</sup>

#### Independent Variables

**Wealth.** Wealth was measured by the logarithm of the average GDP per capita (in 1,000, in PPP terms, constant 2005 International \$) in 1980, 1985, 1990, 1995, 2000, and 2005 from the United Nations Development Program (<http://hdrstats.undp.org/en/indicators/20206.html>) (Fischer & Van de Vliert, 2011). The missing datum of Taiwan was imputed using regression on GDP per capita (1995) from the Economy Watch ([http://www.economywatch.com/economic-statistics/economic-indicators/GDP\\_Per\\_Capita\\_PPP\\_US\\_Dollars/1995/](http://www.economywatch.com/economic-statistics/economic-indicators/GDP_Per_Capita_PPP_US_Dollars/1995/)).

**Thermal climate.** The data of societies’ average high and low temperatures were collected from the website of Weatherbase ([www.weatherbase.com](http://www.weatherbase.com)). Given that 72 °F is the most ideal temperature for thermal comfort (Van de Vliert, 2007a, 2007b, 2011; Van de Vliert et al., 2009), I calculated the absolute difference between the average high temperature and 72 °F and the absolute difference between the average low temperature and 72 °F. Then, I summed up the two absolute difference scores to create an index of a thermal climate, which indicated the *average* harshness of a thermal climate. A higher value represented a more demanding thermal climate.<sup>2</sup>

#### Mediator Variable

**Uncertainty avoidance.** The data of uncertainty avoidance were collected from Geert Hofstede’s website (<http://geert-hofstede.com/countries.html>). A higher score of uncertainty avoidance represented a stronger societal tendency to avoid uncertainty.

#### Control Variables

**Diversity.** Ethnic and religious diversity can decrease social cohesion or generalized social trust (Alesina & La Ferrara, 2002; Delhey & Newton, 2005; Hero, 2003; Nannestad, 2008; Putnam, 2007). Therefore, I included ethnic diversity and religious diversity as control variables. I collected the data of ethnic diversity from two sources—Alesina, Devleeschauwer, Easterly, Kurlat, and Wacziarg (2003) and Fearon (2003). Their scores of ethnic diversity were highly correlated ( $r = .89, p < .001$ ) and therefore were averaged as an index of ethnic diversity ( $\alpha = .94$ ). The data of religious diversity were from Alesina et al. (2003) alone, because Fearon (2003) did not provide them.

**Table 1.** Descriptive Statistics and Correlations

Variable	M	SD	1	2	3	5	6	7
1. Generalized social trust	27.86	14.50						
2. Ethnic diversity	.39	.23	-.41***					
3. Religious diversity	.44	.23	-.03	.15				
5. Land area	-1.19	2.00	.15	.23	-.07			
6. Wealth	2.04	1.12	.34**	-.48***	.08	-.21		
7. Thermal climate	30.83	17.92	.39***	-.33**	.10	.10	.47***	
8. Uncertainty avoidance	65.75	20.76	-.29*	-.12	-.36**	.09	.08	.05

Note:  $N = 67$ .

\* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$  (two-tailed).

*Land area.* In order to account for the physical size of a society, which can influence the variance of thermal climates, I also included the land area as a control variable. I collected the data from CIA World Factbook (<https://www.cia.gov/library/publications/the-world-factbook/rankorder/2147rank.html>) and transformed them to their logarithmic forms.

## Results

Table 1 presents the descriptive statistics and correlations. The average of generalized social trust across societies was 27.86. Generalized social trust was positively correlated with wealth ( $r = .34, p < .01$ ) and thermal climates ( $r = .39, p < .001$ ) and was negatively correlated with uncertainty avoidance ( $r = -.29, p < .05$ ) and ethnic diversity ( $r = -.41, p < .001$ ). However, generalized social trust was not significantly correlated with religious diversity ( $r = -.03, ns$ ) or land area ( $r = .15, ns$ ).

I employed OLS regression to test my hypotheses at the societal level. I mean-centered thermal climates and wealth before creating their interaction term in order to reduce multicollinearity (Cohen, Cohen, West, & Aiken, 2003). I also mean-centered uncertainty avoidance prior to using it as a predictor of generalized social trust.

Table 2 presents the OLS regression results. With ethnic diversity, religious diversity, and land area controlled for, thermal climates and wealth were not significantly related to generalized social trust ( $\beta = .18, ns$ , and  $\beta = .15, ns$ , respectively). Collinearity statistics suggested no multicollinearity problems ( $VIFs < 2$ ). The interaction of thermal climates and wealth was positively related to generalized social trust ( $\beta = .32, p < .05$ ). A follow-up simple slope test (Aiken & West, 1991) for the interaction showed that thermal climates were positively related to generalized social trust in high-wealth societies ( $B = .37, SE = .12, t(62) = 3.16, p < .003$ , but was not significantly related to generalized social trust in low-wealth societies ( $B = -.23, SE = .25, t(62) = -.91, p = .37$  (see Figure 2, using <http://www.jeremydawson.co.uk/slopes.htm>).

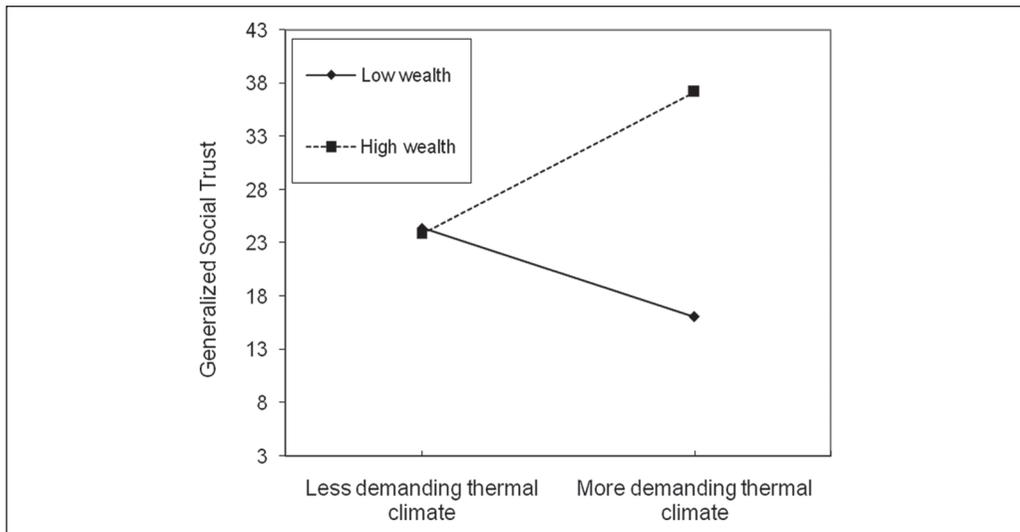
After uncertainty avoidance ( $\beta = -.39, p < .001$ ) was included in the model, the interaction no longer reached significance ( $\beta = .18, ns$ ). A mediated moderation test (Muller, Judd, & Yzerbyt, 2005) suggested a significant mediated moderation effect (see Edwards & Lambert, 2007). Table 3 presents the results of the mediated moderation model. The interaction of thermal climates and wealth was significantly related to both the dependent variable (generalized social trust) ( $B = .27, SE = .13, p < .05$ ) and the mediator variable (uncertainty avoidance) ( $B = -.45, SE = .21, p < .05$ ). Uncertainty avoidance was significantly related to generalized social trust ( $B = -.23, SE = .08, p < .01$ ) and reduced the coefficient magnitude of the interaction of thermal climates and wealth to

**Table 2.** OLS Regression Results

DV: Generalized Social Trust	$\beta$	$F$	$R^2$	$\Delta F$	$\Delta R^2$
Step 1					
Ethnic diversity	-.33*	5.09***	.29		
Religious diversity	.01				
Land area	.24*				
Thermal climate	.18				
Wealth	.15				
Step 2					
Thermal climate $\times$ wealth	.32*	5.50***	.35	5.63*	.06
Step 3					
Thermal climate $\times$ wealth	.18	7.58***	.47	13.30***	.12
Uncertainty avoidance	-.39***				

Note:  $N = 67$ .

\* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$  (two-tailed).



**Figure 2.** The Impact of a Climatoeconomic Interaction on Generalized Social Trust

Note: A more (less) demanding thermal climate or high (low) wealth is represented by +1 (-1) SD from the mean zero.

.20 ( $SE = .13$ ,  $ns$ ). Finally, the interaction of uncertainty avoidance and wealth was not significantly related to generalized social trust ( $B = .13$ ,  $SE = .08$ ,  $ns$ ), suggesting that the moderation effect occurred between thermal climates and uncertainty avoidance rather than between uncertainty avoidance and generalized social trust. Therefore, the proposed hypothesis was supported.<sup>3</sup>

## Discussion

Generalized social trust is an important part of social capital that facilitates civic engagement, economic development, and social cohesion (Fukuyama, 1995; Knack, 2002; Kramer, 1999; Nannestad, 2008). According to Van de Vliert's (2007a, 2007b, 2009, 2011) climatic

**Table 3.** Mediated Moderation Model Results

Predictor	Step 1	Step 2	Step 3
	Generalized Social Trust	Uncertainty Avoidance	Generalized Social Trust
	B (SE)	B (SE)	B (SE)
Intercept	25.39 (2.00)***	4.18 (3.14)	25.83 (1.93)***
Thermal climate	.07 (.13)	.30 (.20)	.11 (.13)
Wealth	4.58 (1.87)*	-1.94 (2.94)	5.77 (2.05)**
Thermal climate × wealth	.27 (.13)*	-.45 (.21)*	.20 (.13)
Uncertainty avoidance			-.23 (.08)**
Uncertainty avoidance × wealth			.13 (.08)

Note:  $N = 67$ .

\* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$  (two-tailed).

demands-resources theory, a society's thermal climate and wealth should jointly affect its generalized social trust. Using archival data of 67 societies, I found empirical support for my hypothesis regarding a climatoeconomic contextualization of generalized social trust. The identified result patterns were similar to those of Van de Vliert (2007a). Nonetheless, I found that the interplay of thermal climates and wealth was positively related to generalized social trust, mediated by the adapted cultural dimension—uncertainty avoidance.

Van de Vliert (2007a) found that a climatic demands-resources match led to collective needs for self-expression, whereas a mismatch led to collective needs for survival. Yet his study did not explicate the cultural dimension that mediated the climatoeconomic contextualization of trust. Van de Vliert (2007a) deemed generalized social trust, coupled with heterogeneous items about signing a petition, justifying homosexuality, and general happiness, as a component of self-expression. However, self-expression was an empirically developed construct, which posed a challenge to testing the mediating societal culture that transmitted the climatoeconomic impact on self-expression. My findings about a climatoeconomic contextualization of trust were based on homogeneous, theory-driven constructs such as generalized social trust (Uslaner, 2002; Zucker, 1986) and uncertainty avoidance (Hofstede, 1980). Consistent with Gupta and Hanges's (2004) claim that "physical climate accounts for small variance in societal culture" (p. 212), I found that the climatoeconomic interaction was only related to uncertainty avoidance, not other cultural dimensions such as individualism-collectivism, masculinity-femininity, and power distance proposed by Hofstede (1983).

### Theoretical Implications

The study is no exception to the fact that every research has its weaknesses. For example, the inherent limitation was that the data were cross-sectional, which raised a problem of cause and effect (Delhey & Newton, 2003, 2005); however, based on Hofstede's theory and Van de Vliert's theory, generalized social trust should be an outcome variable. The findings have important implications for both trust theory and climatic demands-resources theory.

*Trust theory.* Social trust is an important psychological state that exists in various social relationships at multiple levels (Frazier et al., 2010; Fulmer & Gelfand, 2012; Kong et al., 2012;

Lavelle et al., 2007). The managerial and social psychological literatures on trust have deemed trust as a relationship-specific variable in certain types of social exchange (e.g., leadership, negotiation, teamwork) (Colquitt et al., 2007; Cropanzano & Mitchell, 2005; Dirks & Ferrin, 2001, 2002; Kong et al., 2012; McAllister, 1995). However, trust propensity has been neglected in these literatures. According to Mayer et al.'s (1995) model of organizational trust, trust propensity—"the general willingness to trust others" (Mayer et al., 1995, p. 715) or generalized social trust—can moderate the impact of perceived trustworthiness on trust in social exchange. As Hamamura (2012) noted, generalized social trust tends to have perplexing relationships with particularized social trust (Kraus, Piff, & Keltner, 2009), and sometimes they had no relationship with each other (Glaeser, Laibson, Scheinkman, & Soutter, 2000). Generalized social trust affects a trustor's assumptions of social interactions and moderates the linkage between a trustor's perception and trust toward a trustee prior to their interaction (Mayer et al., 1995). Nevertheless, generalized social trust is not developed in vacuum. Rather, it is determined by cultural backgrounds, developmental experiences, and personality traits (Mayer et al., 1995). Social science research has focused on polieconomic rather than ecological determinants of generalized social trust. The current research makes significant contributions by bridging this gap. It shows that generalized social trust is rooted in its ecological context and resultant cultural background. Specifically, in face of demanding thermal climates, societies with adequate wealth-based resources to meet the thermal need enjoy a higher level of generalized social trust than those with inadequate wealth-based resources. In this sense, my findings further Mayer et al.'s (1995) trust model by embedding trust in its ecological context.

The finding that uncertainty avoidance mediated the climatoeconomic impact on generalized social trust has several important implications for trust theory. First, the finding corroborates recent argument and findings that link cultural tightness-looseness and generalized social trust (e.g., Gunia, Brett, Nandkeolyar, & Kamdar, 2011). The dimension of uncertainty avoidance is closely related to the concept of cultural tightness-looseness (Hofstede, 1980, p. 179; Triandis, 2004), which is defined as "the strength of social norms and the degree of sanctioning within societies" (Gelfand, Nishii, & Raver, 2006, p. 1226). Tight cultures have many agreed-upon rules, norms, and standards for appropriate or "correct" behavior. If these rules, norms, and standards are violated, social sanctioning and monitoring will follow. In contrast, there are few agreed-upon rules, norms, or standards that control or correct people's behavior in loose cultures (Gelfand et al., 2006; Gelfand et al., 2011; Triandis, 2004). Individuals in tight cultures "behave" to avoid institutional monitoring and sanctioning, obviating the need for social trust in cooperation, whereas individuals in loose cultures self-define the range of appropriate behavior, making social trust necessary for cooperation (Gunia et al., 2011; Kong, in press). In other words, individuals in tight cultures rely on institutional trust more than social trust in cooperation, whereas individuals in loose cultures rely on social trust more than institutional trust in cooperation (Gunia et al., 2011; Yamagishi, Cook, & Watabe, 1998; Yamagishi & Yamagishi, 1994).

Second, the finding has ruled out alternative explanations about how the climatoeconomic environment influences generalized social trust. Various cultural dimensions can influence trust (Doney et al., 1998). For example, previous research has shown, directly or suggestively, the positive linkage between individualism and generalized social trust (Allik & Realo, 2004) and the negative linkage between power distance and generalized social trust (Delhey & Newton, 2005). The current finding has clearly indicated that it is uncertainty avoidance that mediates the climatoeconomic contextualization of generalized social trust. Stated otherwise, uncertainty avoidance is *the* cultural dimension that determines cross-cultural differences in generalized social trust, when climatic factors are considered.

*Climatic demands-resources theory.* Van de Vliert's climatic demands-resources theory has its great value in predicting various types of outcomes such as self-expression (Van de Vliert,

2007a), development of social value orientation (Van de Vliert et al., 2009), subjective well-being (Fischer & Van de Vliert, 2011), press repression versus press freedom (Van de Vliert, 2011), the perceived importance of wages (Van de Vliert, Van Yperen, & Thierry, 2008), and destructive leadership cultures (Van de Vliert, Mattiesen, Gangsøy, Landro, & Einarsen, 2010). However, the mediating mechanisms that underlie the climatoeconomic impact on these outcomes have not been examined until recently (Fischer & Van de Vliert, 2011). Fischer and Van de Vliert (2011) found that individualism partially mediated the climatoeconomic impact on subjective well-being. Thus, the current research made a significant contribution to the literature based on Van de Vliert's climatic demands-resources theory. As Van de Vliert (2009) noted, "climates create cultures." The ecological context shapes the cultural background of generalized social trust. Given the very limited research on how cultural dimensions or values mediate the climatoeconomic impact on different sociopsychological outcomes, this could be a promising direction for future research.

In practice, shifting collective tendency from uncertainty avoidance to uncertainty tolerance may have an immediate effect on increasing generalized social trust. However, cultural dimensions or values are static (Hofstede, 2001) unless a society can rapidly or suddenly change its wealth-based resources. Wealth accumulation is time-consuming and relies on collective actions. Thus, generalized social trust within a society is very likely to be stable over time. Furthermore, the impact of thermal climates on generalized social trust is not universal but rather is limited to wealthy societies, according to the current research. Thermal climates do not make a difference on generalized social trust in poor societies. Thus, poor societies may not need to factor thermal climates in when designing to enhance their generalized social trust.

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### Notes

1. Neither the number of individuals who responded to the World Value Survey within each society nor its inverse form was significantly correlated with generalized social trust ( $r = -.01$ , *ns*, and  $r = -.12$ , *ns*, respectively).
2. My climate index indicates the *average* harshness of societal thermal climates, using average high and low temperatures, whereas Van de Vliert's (2009) climate index indicates the *extreme* harshness of societal thermal climates, using the highest and lowest temperatures in the hottest and coldest months. I consider Van de Vliert's climate index as particularly useful to research focusing on thermal climates in summers and winters. Given that the *average*, *year-round* relationships among thermal climate, wealth, uncertainty avoidance, and generalized social trust were of interest, I chose to use my climate index. However, these two indices were highly correlated ( $r = .87$ ,  $p < .001$ ), showing strong convergent validity. My climate index was also negatively correlated with the average societal temperature (from weatherhouse.com) ( $r = -.93$ ,  $p < .001$ ).
3. Three other cultural dimensions (Hofstede, 1983)—individualism-collectivism, masculinity-femininity, and power distance (same data source: <http://geert-hofstede.com/countries.html>)—did not mediate the impact of the interaction of thermal climates and wealth on generalized social trust. With the same control variables (ethnic diversity, religious diversity, and land area) and independent variables (mean-centered thermal climates, mean-centered wealth, and their interaction term) included, individualism-collectivism

was not significantly related to generalized social trust ( $\beta = .08, p = .65$ ), nor was masculinity-femininity ( $\beta = -.04, p = .70$ ) or power distance ( $\beta = -.20, p = .14$ ). Due to the missing data problem of Hofstede's long-term orientation index, I did not test its potential mediating effect.

## References

- Aiken, L. S., & West, S. G. (1991). *Multiple regression: Testing and interpreting interactions*. Newbury Park, CA: Sage.
- Alesina, A., Devleeschauwer, A., Easterly, W., Kurlat, S., & Wacziarg, R. (2003). Fractionalization. *Journal of Economic Growth*, 8, 155-194.
- Alesina, A., & La Ferrara, E. (2002). Who trusts others? *Journal of Public Economics*, 85, 207-234.
- Allik, J., & Realo, A. (2004). Individualism-collectivism and social capital. *Journal of Cross-Cultural Psychology*, 35, 29-49.
- Anderson, C., & Galinsky, A. D. (2006). Power, optimism, and risk-taking. *European Journal of Social Psychology*, 46, 511-536.
- Aryee, S., Budhwar, P. S., & Chen, Z. X. (2002). Trust as a mediator of the relationship between organizational justice and work outcomes: Test of a social exchange model. *Journal of Organizational Behavior*, 23, 267-285.
- Axelrod, R. (1984). *The evolution of cooperation*. New York: Basic Books.
- Bachmann, R. (2011). At the crossroads: Future directions in trust research. *Journal of Trust Research*, 1, 203-213.
- Bargh, J. A., & Shalev, I. (in press). The substitutability of physical and social warmth in daily life. *Emotion*.
- Berg, J., Dickhaut, J., & McCabe, K. (1995). Trust, reciprocity, and social history. *Games and Economic Behavior*, 10, 122-142.
- Björnskov, C. (2006). Determinants of generalized trust: A cross-country comparison. *Public Choice*, 130, 1-21.
- Blau, P. M. (1964). *Exchange and power in social life*. New York: Wiley.
- Cohen, J., Cohen, P., West, S. G., & Aiken, L. S. (2003). *Applied multiple regression/correlation analysis for the behavioral sciences*. Hillsdale, NJ: Lawrence Erlbaum Associates.
- Coleman, J. S. (1990). *Foundations of social theory*. Cambridge, MA: Harvard University Press.
- Colquitt, J. A., LePine, J. A., Piccolo, R. F., Zapata, C. P., & Rich, B. L. (2012). Explaining the justice-performance relationship: Trust as exchange deepener or trust as uncertainty reducer? *Journal of Applied Psychology*, 97, 1-15.
- Colquitt, J. A., Scott, B. A., & LePine, J. A. (2007). Trust, trustworthiness, and trust propensity: A meta-analytic test of their unique relationships with risk taking and job performance. *Journal of Applied Psychology*, 92, 909-927.
- Cropanzano, R., & Mitchell, M. S. (2005). Social exchange theory: An interdisciplinary review. *Journal of Management*, 31, 874-900.
- Cunningham, M. R. (1979). Weather, mood and helping behavior: Quasi-experiments with the Sunshine Samaritan. *Journal of Personality and Social Psychology*, 37, 1947-1956.
- Delhey, J., & Newton, K. (2003). Who trusts? The origins of social trust in seven countries. *European Societies*, 5, 93-137.
- Delhey, J., & Newton, K. (2005). Predicting cross-national levels of social trust: Global pattern or Nordic exceptionalism? *European Sociological Review*, 21, 311-327.
- Derfler-Rozin, R., Pillutla, M., & Thau, S. (2010). Social reconnection revisited: The effects of social exclusion risk on reciprocity, trust, and general risk-taking. *Organizational Behavior and Human Decision Processes*, 112, 140-150.
- Dirks, K. T., & Ferrin, D. L. (2001). The role of trust in organizational settings. *Organization Science*, 12, 450-467.

- Dirks, K. T., & Ferrin, D. L. (2002). Trust in leadership: Meta-analytic findings and implications for research and practice. *Journal of Applied Psychology, 87*, 611-628.
- Doney, P. M., Cannon, J. P., & Mullen, M. R. (1998). Understanding the influence of national culture on the development of trust. *Academy of Management Review, 23*, 601-620.
- Dunn, J. R., & Schweitzer, M. E. (2005). Feeling and believing: The influence of emotion on trust. *Journal of Personality and Social Psychology, 88*, 736-748.
- Edwards, J. R., & Lambert, L. S. (2007). Methods for integrating moderation and mediation: A general analytic framework using moderated path analysis. *Psychological Methods, 12*, 1-22.
- Fearon, J. D. (2003). Ethnic and cultural diversity by country. *Journal of Economic Growth, 8*, 195-222.
- Ferrin, D. L., & Gillespie, N. (2010). Trust differences across national-societal cultures: Much to do, or much ado about nothing? In M. Saunders, D. Skinner, G. Dietz, N. Gillespie, & R. J. Lewicki (Eds.), *Trust across cultures: Theory and practice* (pp. 42-86). Cambridge, UK: Cambridge University Press.
- Fischer, R., & Van de Vliert, E. (2011). Does climate undermine subjective well-being? A 58-nation study. *Personality and Social Psychology Bulletin, 37*, 1031-1041.
- Frazier, M. L., Johnson, P. D., Gavin, M., Gooty, J., & Snow, D. B. (2010). Organizational justice, trustworthiness, and trust: A multifoci examination. *Group & Organization Management, 35*, 39-76.
- Fukuyama, F. (1995). *Trust: The social virtues and the creation of prosperity*. New York: Free Press.
- Fulmer, C. A., & Gelfand, M. J. (2012). At what level (and in whom) we trust: Trust across multiple organizational levels. *Journal of Management, 38*, 1167-1230.
- Gelfand, M. J., Nishii, L. H., & Raver, J. L. (2006). On the nature and importance of cultural tightness-looseness. *Journal of Applied Psychology, 91*, 1225-1244.
- Gelfand, M. J., Raver, J. L., Nishii, L., Leslie, L. M., Lun, J., Lim, B. C., et al. (2011). Differences between tight and loose cultures: A 33-nation study. *Science, 332*, 1100-1104.
- George, J. M., & Zhou, J. (2002). Understanding when bad moods foster creativity and good ones don't: The role of context and clarity of feelings. *Journal of Applied Psychology, 87*, 687-697.
- Gheorchium, M. A., Vignoles, V. L., & Smith, P. B. (2009). Beyond the United States and Japan: Testing Yamagishi's emancipation theory of trust across 31 nations. *Social Psychology Quarterly, 72*, 365-383.
- Giddens, A. (1990). *The consequences of modernity*. Stanford, CA: Stanford University Press.
- Glaeser, E., Laibson, D., Scheinkman, J., & Soutter, C. (2000). Measuring trust. *Quarterly Journal of Economics, 115*, 811-846.
- Glanville, J. L., & Paxton, P. (2007). How do we learn to trust? A confirmatory tetrad analysis of the sources of generalized trust. *Social Psychology Quarterly, 70*, 230-242.
- Gulati, R. (1995). Does familiarity breed trust? The implications of repeated ties for contractual choices. *Academy of Management Journal, 35*, 85-112.
- Gulati, R., Nohria, N., & Zaheer, A. (2000). Strategic networks. *Strategic Management Journal, 21*, 203-215.
- Gunia, B. C., Brett, J. M., Nandkeolyar, A. K., & Kamdar, D. (2011). Paying a price: Culture, trust, and negotiation consequences. *Journal of Applied Psychology, 96*, 774-789.
- Gupta, V., & Hanges, P. J. (2004). Regional and climate clustering of societal cultures. In R. J. House, P. J. Hanges, M. Javidan, P. W. Dorfman, & V. Gupta (Eds.), *Culture, leadership, and organizations: The GLOBE study of 62 societies* (pp. 178-218). Thousand Oaks, CA: Sage.
- Hamamura, T. (2012). Social class predicts generalized trust but only in wealthy societies. *Journal of Cross-Cultural Psychology, 43*, 498-509.
- Hardin, R. (2002). *Trust and trustworthiness*. New York: Russell Sage Foundation.
- Hero, R. (2003). Social capital and racial inequality in America. *Perspectives on Politics, 1*, 113-122.
- Hetherington, M. J. (2005). *Why trust matters: Declining political trust and the demise of American liberalism*. Princeton, NJ: Princeton University Press.
- Hofstede, G. (1980). *Culture's consequences: International differences in work-related values*. Beverly Hills, CA: Sage.

- Hofstede, G. (1983). National cultures in four dimensions. *International Studies of Management & Organization, 13*, 46-74.
- Hofstede, G. (2001). *Culture's consequences: Comparing values, behaviors, institutions, and organizations across nations* (2nd ed.). Thousand Oaks, CA: Sage.
- Hong, J., & Sun, Y. (in press). Warm it up with love: The effect of physical coldness on liking of romance movies. *Journal of Consumer Research*.
- Ijzerman, H., & Semin, G. R. (2009). The thermometer of social relations. *Psychological Science, 20*, 1214-1220.
- Inglehart, R., Basañez, M., Diez-Medrano, J., Halman, L., & Luijckx, R. (2004). *Human beliefs and values*. Ann Arbor: University of Michigan Press.
- Karasek, R. A. (1979). Job demands, job decision latitudes, and mental strain: Implications for job redesign. *Administrative Science Quarterly, 24*, 285-308.
- Keller, M. C., Fredrickson, B. L., Ybarra, O., Côté, S., Johnson, K., Mikels, J., Conway, A., & Wager, T. (2005). A warm heart and a clear head: The contingent effects of weather on mood and cognition. *Psychological Science, 16*, 724-731.
- Khodyakov, D. (2007). Trust as a process: A three-dimensional approach. *Sociology, 41*, 115-132.
- Klasing, M. J. (2011). *Cultural traits, collective values and the roots of political institutions*. Working Paper, Carleton University.
- Knack, S. (2002). Social capital and the quality of government: Evidence from the United States. *American Journal of Political Science, 46*, 772-785.
- Kong, D. T. (in press). Intercultural experience as an impediment of trust: Examining the impact of intercultural experience and social trust culture on institutional trust in government. *Social Indicators Research*.
- Kong, D. T., Dirks, K. T., & Ferrin, D. L. (2012, August). *Interpersonal trust within negotiations: A meta-analytic evidence, critical contingencies, and directions for future research*. Paper presented at the annual meeting of Academy of Management, Boston.
- Konovsky, M., & Pugh, D. (1994). Citizenship behavior and social exchange. *Academy of Management Journal, 37*, 656-669.
- Kramer, R. M. (1999). Trust and distrust in organizations: Emerging perspectives, enduring questions. *Annual Review of Psychology, 50*, 569-598.
- Kramer, R. M., & Lewicki, R. J. (2010). Repairing and enhancing trust: Approaches to reducing organizational trust deficits. *Academy of Management Annals, 4*, 245-277.
- Kraus, M., Piff, P., & Keltner, D. (2009). Social class, the sense of control, and social explanation. *Journal of Personality and Social Psychology, 97*, 992-1004.
- Lavelle, J. J., Rupp, D. E., & Brockner, J. (2007). Taking a multifoci approach to the study of justice, social exchange, and citizenship behavior: The target similarity model. *Journal of Management, 33*, 841-866.
- Lazarus, R. S., & Folkman, S. (1984). *Stress, appraisal and coping*. New York: Springer.
- Lewicki, R. J., Tomlinson, E. C., & Gillespie, N. (2006). Models of interpersonal trust development: Theoretical approaches, empirical evidence, and future directions. *Journal of Management, 32*, 991-1022.
- Loewenstein, G. F., Weber, E. U., Hsee, C. K., & Welch, N. (2001). Risk as feelings. *Psychological Bulletin, 127*, 267-286.
- Mayer, R. C., David, J. H., & Schoorman, F. D. (1995). An integrative model of organizational trust. *Academy of Management Review, 20*, 709-734.
- McAllister, D. J. (1995). Affect- and cognition-based trust as foundations for interpersonal cooperation in organizations. *Academy of Management Journal, 38*, 24-59.
- McEvily, B. (2011). Reorganizing the boundaries of trust: From discrete alternatives to hybrid forms. *Organization Science, 22*, 1266-1276.
- McEvily, B., Perrone, V., & Zaheer, A. (2003). Trust as an organizing principle. *Organization Science, 14*, 91-103.

- Muller, D., Judd, C. M., & Yzerbyt, V. Y. (2005). When moderation is mediated and mediation is moderated. *Journal of Personality and Social Psychology, 89*, 852-863.
- Nannestad, P. (2008). What have we learned about generalized trust, if anything? *Annual Review of Political Science, 11*, 413-436.
- Neville, L. (in press). Do economic equality and generalized trust inhibit academic dishonesty? Evidence from state-level search-engine queries. *Psychological Science*.
- Parsons, K. C. (2003). *Human thermal environments: The effects of hot, moderate and cold environments on human health, comfort and performance* (2nd ed.). London: Taylor & Francis.
- Putnam, R. (2000). *Bowling alone: The collapse and revival of American community*. New York: Simon and Schuster.
- Putnam, R. (2007). E pluribus unum: Diversity and community in the twenty-first century. *Scandinavian Political Studies, 30*, 137-174.
- Realo, A., Allik, J., & Greenfield, B. (2008). Radius of trust: Social capital in relation to familism and institutional collectivism. *Journal of Cross-Cultural Psychology, 39*, 447-462.
- Rousseau, D. M., Sitkin, S. B., Burt, R. S., & Camerer, C. (1998). Not so different after all: A cross-discipline view of trust. *Academy of Management Review, 23*, 393-404.
- Simmel, G. (1950). *The sociology of Georg Simmel*. Glencoe, IL: Free Press.
- Sitkin, S. B., & Weingart, L. R. (1995). Determinants of risky decision-making behavior: A test of the mediating role of risk perceptions and propensity. *Academy of Management Journal, 38*, 1573-1592.
- Stack, L. C. (1978). Trust. In H. London & J. E. Exner, Jr. (Eds.), *Dimensions of personality* (pp. 561-599). New York: John Wiley & Sons.
- Toplyn, G., & Maguire, W. (1991). The differential effect of noise on creative task performance. *Creativity Research Journal, 4*, 337-347.
- Triandis, H. C. (2004). The many dimensions of culture. *Academy of Management Executive, 18*, 88-93.
- Troisi, J. D., & Gabriel, S. (2011). Chicken soup really is good for the soul: "Comfort food" fulfills the need to belong. *Psychological Science, 22*, 747-753.
- Uslaner, E. (2002). *The moral foundations of trust*. Cambridge, UK: Cambridge University Press.
- Uslaner, E. M., & Brown, M. (2005). Inequality, trust, and civic engagement. *American Politics Research, 33*, 868-894.
- Van de Vliert, E. (2007a). Climateeconomic roots of survival versus self-expression cultures. *Journal of Cross-Cultural Psychology, 38*, 156-172.
- Van de Vliert, E. (2007b). Climates create cultures. *Social and Personality Psychology Compass, 1*, 1-15.
- Van de Vliert, E. (2009). *Climate, affluence, and culture*. New York: Cambridge University Press.
- Van de Vliert, E. (2011). Bullying the media: Cultural and climate-economic readings of press repression versus press freedom. *Applied Psychology: An International Review, 60*, 354-376.
- Van de Vliert, E., Mattiesen, S. B., Gangsøy, R., Landro, A. B., & Einarsen, S. (2010). Winters, summers, and destructive leadership cultures in rich regions. *Cross-Cultural Research, 44*, 315-340.
- Van de Vliert, E., Van der Vegt, G. S., & Janssen, O. (2009). Prosocial to egoistic enculturation of our children: A climate-economic contextualization. *Negotiation and Conflict Management Research, 2*, 123-137.
- Van de Vliert, E., Van Yperen, N. W., & Thierry, H. (2008). Are wages more important for employees in poorer countries with harsher climates? *Journal of Organizational Behavior, 29*, 79-94.
- Whitener, E., Brodt, S., Korsgaard, M. A., & Wener, J. (1998). Managers as initiators of trust: An exchange relationship for understanding managerial trustworthy behavior. *Academy of Management Journal, 23*, 513-530.
- Williams, L. E., & Bargh, J. A. (2008). Experiencing physical warmth promotes interpersonal warmth. *Science, 322*, 606-607.
- World Values Survey. (1981-2008). *Official Aggregate v.20090901, 2009*. Madrid, Spain: World Values Survey Association. [www.worldvaluessurvey.org](http://www.worldvaluessurvey.org).

- Yamagishi, T. (1986). The provision of a sanctioning system as a public good. *Journal of Personality and Social Psychology, 51*, 110-116.
- Yamagishi, T., Cook, K. S., & Watabe, M. (1998). Uncertainty, trust, and commitment formation in the United States and Japan. *American Journal of Sociology, 104*, 165-194.
- Yamagishi, T., Kikuchi, M., & Kosugi, M. (1999). Trust, gullibility, and social intelligence. *Asian Journal of Social Psychology, 2*, 145-161.
- Yamagishi, T., & Yamagishi, M. (1994). Trust and commitment in the United States and Japan. *Motivation and Emotion, 18*, 129-166.
- Zaheer, A., McEvily, B., & Perrone, V. (1998). Does trust matter? Exploring the effects of interorganizational and interpersonal trust on performance. *Organization Science, 9*, 141-159.
- Zaheer, A., & Venkatraman, N. (1995). Relational governance as an interorganizational strategy: An empirical test of the role of trust in economic exchange. *Strategic Management Journal, 16*, 373-392.
- Zhong, C.-B., & Leonardelli, G. J. (2008). Cold and lonely: Does social exclusion literally feel cold? *Psychological Science, 19*, 838-842.
- Zucker, L. (1986). Production of trust: Institutional sources of economic structure 1840-1920. *Research in Organizational Behavior, 8*, 53-111.