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The Index of Cultural Tightness and Looseness among 68 Countries*

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Abstract

If a culture is characterized by pervasive norms and sanctioning of deviance from norms, it is a tight culture. In a tight culture, people's values, norms, and behavior are similar to each other. Thus, cultural tightness can be conceptualized as homogeneity in values, norms, and behavior. As such, the cultural tightness and looseness can be captured by *s.d.*. In the present study, a conceptual framework to study cultural tightness and looseness was suggested. Three different indices of cultural tightness and looseness in 68 societies were developed based on cultural level *s.d.*s: a domain specific index, a domain general index, and a combination index. The combination cultural tightness and looseness index showed the greatest validity compared with the domain specific index, domain general index, and another measure based on aggregation of individual level perceptions. With the cultural tightness and looseness index at hand, further theoretical predictions pertaining to the cultural tightness and looseness can be tested. In general, wider use of *s.d.* was advocated.

(163 words)

KEYWORDS: Cultural tightness and looseness

Norms

Measurement

Values, Attitudes, Beliefs

Cultural variation

The Index of Cultural Tightness and Looseness among 68 Countries

Cultural tightness and looseness, CTL, taps into variance in norms, values, and behavior (e.g., Carpenter, 2000; Triandis, 1989). The idea of CTL was first suggested during 1960s (Pelto, 1968), and developed theoretically since then (e.g., Gelfand, Nishii & Raver, 2006; Gelfand et al., 2011; Triandis, 1989). In the present paper, it was argued that CTL is a cultural level concept, and should be measured as such. Based on this conceptualization, a theoretical framework to study the validity of CTL (Figure 1) was developed, followed by the discussion of potential methodological issues. Unlike an existing measure of perceptions of cultural tightness, which is based on asking unrepresentative samples if their culture is tight (Gelfand et al., 2011), the CTL measure developed here tapped into actual variation at the cultural level. Three alternative indices of tightness and looseness were derived from the variation in endorsement of different values among 68 countries. Finally, the merits and potential contribution of the CTL measure were discussed.

What is cultural tightness?

Pelto (1968) suggested that cultures can be classified according to the degree of their tightness and looseness. Triandis (1989) suggested that homogeneous cultures are tight and heterogeneous cultures are loose, and that a tight culture does not allow for much variation in values and behavior that are deemed acceptable, whereas there is considerable degree of latitude in loose cultures. In his use (1989), a homogeneous culture is almost always tight, and a heterogeneous culture is loose: "…heterogeneous societies have groups with dissimilar norms…Because rejection of ingroup members is emotionally draining, cultures develop tolerance for deviation from the norms. As a result, homogeneous cultures are often rigid in requiring that ingroup members behave according to ingroup norms. Such cultures are *tight*…In short, tight cultures (Pelto, 1968) have clear norms that are reliably imposed. Little

deviation from normative behavior is tolerated, and severe sanctions are administered to those who deviate" (p.511).

Gelfand, Nishii, and Raver (2006) foresee mutually reinforcing relationship between cultural homogeneity and tightness: "The degree of variation in individual differences across societies helps to reinforce and maintain the tightness–looseness of the societal context. Less variation in tight as compared with loose societies enables individuals to mutually reinforce normative expectations, which ultimately enhances predictability and order." (p. 1230)

Carpenter (2000) uses the homogeneity to describe cultural tightness: "In 'tight' cultures, norms are explicit and stringently enforced. Individuals must conform to group values, and tolerance for deviation is minimal. These cultures tend to be homogeneous with respect to particular attitudes and behaviors." (p.41).

As cited above, Triandis (1989) theorizes that culturally loose societies are more tolerant of deviant behavior precisely because of their heterogeneity: there is a lot of variation among ingroup members, and rejecting an ingroup member is painful. Heterogeneous groups have, by definition, more variability. Further, it can be argued that what constitutes deviance is less clear in groups where there is a lot of variability among members. Therefore, heterogeneous groups should show more tolerance for deviation not only because it is painful to reject a deviant ingroup member, but also because the definition of deviance is more lax to start with. The reverse should occur for homogenous groups: because there are clear norms as to what is appropriate, deviance is more clearly defined as well. Likewise, since group members are more similar to each other, the group would not face the painful rejection decision as often as loose cultures, and thus can afford to show less tolerance for the small number of the deviants. Showing less tolerance in return should reinforce homogeneity. In other words, if a culture is heterogeneous, then by definition, its norms, values, and standards of behavior are not pervasive, and what is not pervasive cannot be sanctioned. If a culture

has clear and pervasive norms and follows closely the adherence to these norms, it has a tight distribution around the mean. Therefore, the cultural tightness is synonymous with cultural homogeneity, i.e., variance. As Triandis (2004) puts it "Tightness requires agreement about norms" (p.92).

Homogeneity means there is little deviation in the social norms, values and behavior that people adopt in a society. If a norm is clear and pervasive, members of that society know the norm well and strongly agree upon it, whatever the norm might be. Concurrence among the members on the appropriate norms, values, and behavior, i.e. wherever the mean value resides, indicates little variation around that mean. As is well known in general, and especially in the false consensus literature (e.g., Ross, Greene & House, 1977) and pluralistic ignorance literature (e.g., Prentice & Miller, 1993), people are not particularly adept at guessing the correct number of people who agree with themselves, rendering self- report measures of the perceptions of clarity and pervasiveness of cultural norms unreliable. False consensus is incorrect assumption that most people think like the individual, and pluralistic ignorance is the incorrect assumption that few people think like the individual. In other words, people can grossly overestimate (as in false consensus effect) or grossly underestimate (as in pluralistic ignorance) the extent others agree with the individual on what constitute the norms. Thus, asking members how clear or pervasive norms are (e.g., Gelfand et al., 2011), cannot accurately capture actual tightness and looseness. Rather, such a method could assess the individuals' *perception* of the extent of cultural tightness. If CTL is the clarity and pervasiveness of norms (Gelfand et al., 2006), then the most direct way to capture the actual CTL is to look at the variation on norms, values, and behavior.

A framework for CTL

Validity of any CTL measure can only be assessed in a nomological network. Inspired by Berry et al. (1986) and Gelfand et al. (2011), a general framework for CTL is proposed

(Figure 1). For the ecological context of cultural tightness, threat to survival is deemed as a prerequisite (Gelfand et al., 2011). For the socio-political context of cultural tightness, traditional society and institutional repression were conceived as the fertile ground for strong norms that are enforced (Durkheim 1893/1984). These two background factors interact with cultural tightness, which in return influences (and is influenced by) subjective states, attitudes toward dissimilar others and deviance, and observed behavioral inhibition of individuals.

Threat to survival. The principal prerequisite to cultural tightness is threat to survival (Figure 1). Foremost, "ecological and human-made threats increase the need for strong norms and punishment of deviant behavior in the service of social coordination for survival" (Gelfand et al., p. 1101, 2011).Various threats, e.g., resource scarcity, wars, terrorism, natural disasters, physical illnesses, political turmoil, water safety, high stress, etc., are all problems because these and similar threats decrease chances of survival. Therefore, societies need to develop strong norms and sanctions to deal with threats.

One can study the relation of CTL with threats to survival by sampling some of the threats (e.g., Gelfand et al., 2011) or by using a proxy variable that captures the aggregate of all threats that matter for survival. Sampling some of the threats is useful for providing examples, but this strategy is bound to miss some of the threats to survival. The alternative strategy of using a proxy measure for aggregating all threats to survival overcomes that deficiency.

To measure aggregate threat to survival, we need to define what threat is. According to the studies by Van de Vliert and colleagues (e.g., Van de Vliert, Huang & Levine, 2004; Van de Vliert & Postmes, 2014), stressful environments per se do not create threat: for environmental demands to become threats to survival, they need to be unmatched by adequate resources. To give an example, earthquakes may be stressful, but for them to become threats to survival, they need to actually kill or injure people. On the flip side of the

same coin, if societies can deal with potential environmental stressors, for instance by building earthquake resistant structures, potential environmental stressors are not threats to survival anymore because they do not kill anybody.

If threat to survival is defined as it is: anything that actually threatens survival, then measures that best capture the aggregate of threats are those that can reflect the survival prospects of a population at a given time. There is one such measure: the life expectancy in a society. Life expectancy at birth is "the average number of years that a newborn could expect to live, if he or she were to pass through life exposed to the sex- and age-specific death rates prevailing at the time of his or her birth, for a specific year, in a given country, territory, or geographic area" and "reflects the overall mortality level of a population. It summarizes the mortality pattern that prevails across all age groups - children and adolescents, adults and the elderly" (WHO, 2014a). The calculation of life expectancy involves taking into account threats at various ages from communicable diseases, maternal and natal conditions, nutritional deficiencies, non-communicable diseases (including mental disorders), unintentional injuries such as traffic accidents, as well as intentional injuries due to suicide, violence, and war (WHO, 2014b). As such, life expectancy can be regarded as an aggregate measure summarizing all actual threats to survival. Because societies exposed to threats need to develop strong social norms and sanctioning of deviant behavior for survival of its members (Gelfand et al., 2011; Gelfand, 2012), the more threats a society faces -as indexed by historical and current life expectancy-, the tighter the society should be (Figure 1).

Socio-political context of CTL. Cultural processes should be realized by and reflected in the socio-political context (Berry et al., 1986; Gelfand et al., 2011; Gelfand, 2012). Sociologist Emile Durkheim's (1893/1984) work on division of labor in society can help to specify the properties of the socio-economic context of CTL.

Durkheim (1893/1984) conceptualizes societal structure as a continuum between mechanical solidarity and organic solidarity. Mechanical societies are traditional. In these traditional societies, people are bound by collective conscious, i.e., a structured set of shared beliefs, ideas, and moral attitudes based primarily on religion. These societies are characterized by the severity of penalty imposed on deviants and repressive laws in general. In Durkheim's own words "Structure enables society to hold the individual more tightly in its grip, making him more strongly attached to his domestic environment, and consequently to tradition" (1984, p. 242) and "The similarity of consciousnesses gives rise to legal rules which, under the threat of repressive measures, impose upon everybody uniform beliefs and practices" (p.172). Organic societies, on the other hand, are more industrialized. They arise out of increasing population density and the consequent division of labor. Due to division of labor in these industrialized societies, people are bound by economic interdependence rather than moral agreement. The moral homogeneity which was once the cement of the collective conscious erodes, giving way to individual conscious. Because individual conscious is more dominant than collective conscious in industrialized societies, their constituent members are less disturbed by deviance, and the laws are no longer repressive (Durkheim, 1893/1984). To recap, mechanical societies are traditional, characterized by homogeneity of norms, values, and behaviors, and the institutional repression; whereas organic societies are industrialized, characterized by heterogeneity of norms, values, and behaviors, and the greater freedom they enjoy.

Borrowing from Durkheim to develop theorizing of CTL, tight societies should be more traditional and repressive, whereas loose societies should be more industrialized and liberal (Figure 1). Such a conceptualization is in agreement also with previous CTL theorists' suggestions. For instance, Pelto (1968) argued that agricultural societies are tightest. Triandis (1989) suggested that degree of urbanization is also an important factor. Triandis (1989)

predicted that the more remote a society is from other societies, the more similar its members would be to each other. The extent of the remoteness of a society from the rest of the world can be indexed by the degree of globalization. Thus, globalization can be another indicator of being an industrialized vs traditional society. Another factor related to the socio-political structure of a traditional society is income. Income, in general, should be a correlate of any cultural variable, to the extent that culture and environment are inextricably linked (e.g., Hofstede, 2001; Inglehart & Baker, 2000; Schwartz & Sagie, 2000). Income is part of the ecosystem in which cultural adaptations develop (Van de Vliert, Huang & Levine, 2004). In the particular case of CTL, income should be positively correlated with looseness for two more reasons: because wealth brings security, and because the more income an individual has, the greater the flexibility in behavior is, resulting in variety in values. The examples can be expanded, but overall it seems that what CTL theorists have suggested to be related with cultural tightness were in agreement with Durkheim's conceptualization of traditionalism in mechanical society. Thus, the more traditional a society is, the tighter it should be.

Another aspect of Durkheim's mechanical vs. organic society, i.e., the severity of punishment, is also echoed in CTL literature. Because societies exposed to threats need to develop strong social norms and sanctioning of deviant behavior for survival of its members (Gelfand et al., 2011; Gelfand, 2012), this requirement should also be supported by institutional means of control and repression. Tight nations are less likely to have democracy, freedom of press (Gelfand et al., 2011), judicial independence, economic freedom and more likely to have military control. Thus, the greater the institutional repression is, the tighter a society is.

Psychological symptoms of cultural tightness. Because tightness is characterized by strength of norms and sanctioning for deviance, individuals in tight countries should feel they

do not have much freedom of choice and control. They should report lower levels of subjective well-being (Triandis, 2000; but see Van de Vliert & Postmes, 2014).

Because pervasiveness of norms and degree of sanctioning are defining attributes of CTL (Gelfand et al., 2006), a good measure of CTL should be able to capture reflections of these attributes in the attitudes of its members: in tight societies, people should be less willing to live near dissimilar others, and less tolerant of moral deviations.

Because of tight control of behavior and sanctioning, there should be behavioral inhibition: less left handedness, less variation in personalities, more conformity and less innovation. Cultural tightness should be negatively correlated with innovation not only because innovation emanates from departure from the existing thinking but also because by its very nature, innovation introduces variation and change to the status quo-an undesirable characteristic in tight cultures.

The relation of cultural tightness to existing cultural constructs

The relation of CTL with other cultural constructs is twofold: with one group of constructs, there should be associations, whereas with some others there should be no associations. On the association side are the concepts of traditional vs. secular-rational values, and survival vs. self-expression values as defined by Inglehart and Baker (2000). Traditional/secular-rational values tap into deference to authority, in particular God, whereas survival/self-expression values tap into insecurity, intolerance, and feeling threatened. Traditional and survival values should be more prevalent in tight societies.

Cultural tightness should co-occur with collectivism (Triandis, 1989). Collectivist cultures emphasize obedience to group norms, and thus it should be correlated with cultural tightness (Triandis, 1989). Carpenter (2000) found support for this hypothesis (r = .44) in 16 cultural groups by tediously studying Human Relations Area Files. Because collectivism is

closely related with power distance and greater power distance implies accepted inequalities in a society, cultural tightness-looseness should also be related with power distance.

Indulgence vs. restraint is another related construct (Hofstede, Hofstede, & Minkov, 2010). Indulgence is free gratification of basic and natural human drives related to enjoying life and having fun. Restraint is the suppression of gratification of needs and regulation of them by means of strict social norms. Although cultural tightness is not necessarily against enjoying life, it is very much related with strong social norms. Therefore, to the degree restraint is prevalent in a culture, the variation should be small, i.e., culture should be tight.

Triandis (2004) suggested that uncertainty avoidance dimension of Hofstede's cultural values resemble cultural tightness. However, Gelfand et al. (2006) maintained that the two are different. It is yet to be determined if the two co-occur. However, CTL should not be related with the other dimension of Hofstede, i.e., Masculinity-Femininity because masculinity-femininity dimension taps into differential emphasis on masculine vs feminine norms, and either of these norms can be strong in a tight society. Likewise, value consensus as defined by Schwartz and Sagie (2000) is different from cultural tightness. Value consensus is about the abstract priorities. It is the degree to which individual members of society similarly place importance to self-direction, stimulation, hedonism, achievement, power, security, conformity, tradition, benevolence and universalism. Moreover, value consensus increases with income and democratization (Schwartz & Sagie, 2000), whereas income and the various forms of freedom are theorized to relate negatively to tightness. Thus, there should not be any relation between value consensus and tightness.

Methodological issues

At the methodological level, there is disagreement in the literature on two issues that may relate to the CTL measures suggested here. One is specifically about the treatment of *s.d.*

in cross-cultural comparisons, while the other is about the general informativeness of domain specific vs. domain general constructs.

The issue regarding the treatment of *s.d.* centers around whether *s.d.* is a useful construct (e.g., Smith, 2004; Van Hemert, Van de vijver, Poortinga, & Georgas, 2002) or whether it should be neutralized because it biases data in cross-cultural comparisons (e.g., Hofstede, 2001; Van de vijver & Leung, 1997). It is well known that culture may affect responding styles (e.g., Fischer & Schwartz, 2011; Schwartz, 2014). In particular, acquiescent response style, ARS, is the tendency to give positive responses to questions and extreme response style, ERS, is using the extreme ends of the item response scale. To overcome such biases in cross-cultural comparisons, several methods are suggested (e.g., Fischer, 2004) including getting rid of the differences in *s.d.* However, it is important to emphasize that neither ARS nor ERS are identical with the standard deviation (Cheung & Rensvold, 2000). The distortion that ERS and ARS may cause is about the extremity in an individual's responses across variables, whereas *s.d.* is variation in a variable across individuals. Of two response sets with identical means, the one with more extreme response may have smaller, larger or equal *s.d.* In other words, ERS (or ARS) and *s.d.* do not measure the same thing, and there are better methods to control for them (e.g., Greenleaf, 1992; Fischer, 2004; Fischer & Milfront, 2010). Further, standardization may discard valuable information (e.g., Smith, 2004; 2011).

Quite counterintuitively, ERS and CTL should be negatively correlated. CTL is defined as strength of and tolerance for deviations from norms. To the extent that norms are strong, one should expect increased use of scale ends, not decreased use of them. When a norm is clear and pervasive, people should have strong opinions. In other words, the people living in tighter cultures should use extreme ends of the scale more often than the people living in looser cultures when responding to value surveys.

Second issue of disagreement is whether we can talk about a domain general construct vs. domain specific constructs. Since Spearman's g-factor of intelligence (1904), the debate continues as to whether domain general g-factors or domain specific s-factors are more useful in measuring constructs. Of relevance to CTL are the studies of dispersion. Previous researchers have successfully employed both domain general (e.g., Naemi, Beal, & Payne, 2009; Schwartz & Sagie, 2004; Smith, 2004, 2011) and domain specific measures of dispersion (e.g., Fischer & Schwartz, 2011; Huang & Van de Vliert, 2002). Au (1999) suggested existence of both domain general and domain specific intra-cultural variation, and later (Au, 2000; Au & Cheng, 2004) used domain specific intra-cultural variations in predicting various job related issues. Au (2000) used *s.d.* of 14 work-related variables, and showed that the structure of factors formed by cultural means and that of *s.d.*s are different. Au and Cheng (2004) used one item measure of *s.d.* to study job autonomy while employing domain general *s.d.* of 67 variables to control for differences in responding styles. In the case of CTL, it is yet to be empirically determined that if domain general, domain specific or a combination measure would best capture CTL.

The goal of the present research

In the present research, *s.d* is the primary variable of interest -not an auxiliary variable that needs to be controlled for. To explore usefulness of domain general vs. domain specific constructs, three different indices of CTL were developed based on *s.d.*s: a domain general index, a domain specific index, and a combination index. After the detailed description of development of the three indices, the theoretical relations described above were tested using the three indices of CTL as well as a measure of perceptions of CTL (Gelfand et al., 2011). The goal was to find a measure that would represent CTL at the most global level.

Method

Cultural tightness-looseness was operationalized as dispersion, i.e. standard deviation. The source file was European and World Values Survey, EWVS, integrated dataset (2006). EWVS is a survey of values, norms, and behaviors carried out in representative national samples. This file contains four waves of surveys carried out since 1981. Among the four waves, the 2000 wave was selected for analysis because largest number of countries, 70, was represented in the 2000 wave[1]. The data were based on responses from 101172 people. However, Iraq and Israel did not have enough data for any of the analysis described below, leaving 68 countries in the effective data set.

In the EWVS, response ranges to different questions were highly variable. In order to ensure that contribution of each potential variable was not influenced by the response range available, it was necessary to rescale all the end points on the response scale for each variable to 1[2]. Thus, the highest values of the variables have been rescaled to 1 in order to establish comparability among different variables.

In the construction of CTL indices, not all variables in the EWVS can be used because every single question was not asked in each of the 68 countries. Including variables that are not asked in sizeable number of countries would have compromised data quality in terms of validity and reliability because some countries would have been represented by all variables, whereas some would have been represented by just a few variables. On the other hand, setting the standard at 100%, i.e. requiring a question to be asked in 100 % of countries in order to be included in the analysis, would have left only two variables. Therefore, a middle ground was adopted: If a question was asked in at least 90 % of countries, then it was retained for further analysis. If it was asked in less than 90 % of the countries, then it was screened out.

[1] Although there are newer waves, 2005 and 2014, they have not been selected for analysis because the number of countries in both 2005 and 2014 were less than that of in the 2000 wave.

[2] Standardizing the variables was not an option since the variation itself was precisely the focus of the study, and standardization artificially rescales the variance to 1.

A similar screening was applied to countries. If a country did not have responses to more than 10% of the items, that country was left out of the analysis. The countries that have values on at least 90% of the items were retained in the index construction. If a retained country was missing on a value, then that missing value for that particular country was replaced by the mean of the survey for that variable.

Based on EWVS data, three different but related indices were presented. The first index was domain specific in that it exclusively focused on morality. The second index was domain general in that it did not partition the domains but instead used all the available data. The final index was formed by specification of domains, followed by factor analysis of groups of domains to extract the tightness-looseness index. In all three indices below, the higher the score was, the higher the cultural looseness was.

After the index construction, variables used for validation were introduced.

Domain Specific Index

The sample for this analysis consisted of 68 countries. EWVS (2006, wave: 2000) contained Morally Debatable Behaviors Scale, MDBS: people's tolerance for moral deviations (Harding & Phillips, 1986). Of these, the *s.d.*s of responses to acceptability of prostitution, abortion, divorce, euthanasia, and suicide were averaged at the country level. After transformation of the raw data, culturally most tight society received a score of 0 on the index of CTL (Table 1, column 2). The domain specific index was highly reliable at the country level, Cronbach's $\alpha = .88$ (see Supplemental Materials for more details).

Domain General Index

The sample for this analysis consisted of 64 countries. The variation in the endorsement of diverse set of values and behavioral practices assessed in the EWVS (2006; wave: 2000) should represent the CTL at the broadest scope possible (see Supplemental Materials). The *s.d.* of each available variable, i.e., 124 variables, computed for each

country. Finally, the mean of the all *s.d.*s was calculated. After transformation of the raw data, culturally most tight society received a score of 0 on the index of CTL (Table 1, column, 3). The domain general index was reliable at the country level, Cronbach's $\alpha = .92$ (see Supplemental Materials for more details).

The Combination Index

The sample for this analysis consisted of 65 countries. For the combination index, the questions in the EWVS were grouped according to the domain they pertain to. Subsequently, the domains represented in EWVS were factor analyzed to assess if there was a general factor that could represent cultural tightness-looseness. Work, family, and religion domains loaded on a single factor accounting for 54.4 % of variance, whereas politics loaded on a second factor accounting for 28.6 % of variance. The culture-level alpha computed across countries showed that the composite of these three variables, i.e., *s.d.*s of work, family, and religion, was reliable, Cronbach's $\alpha = .77$. Thus, work, family, and religion domains were retained for the index construction. Next, a weight for each domain is created based on importance of that particular domain indicated by respondents in each country. The weighted average of the domains of work, family, and religion *s.d.*s was calculated. After transformation of raw scores, culturally most tight society received a score of 0 on the index of CTL[3] (see Supplemental Materials for more details). The higher the score on index was, the looser the culture was (Table 1, column 4).

Validation variables[4]

Threat. The total sum of actual threat to survival is operationalized as the living expectancy reverse coded. Both the historical, 1950, and current, 2000, living expectancy at birth were taken from WHO (2014a).

[3] Note that all the transformations preserved the ranking of countries.
[4] Simple correlations of the three indices of CTL and the perception measure with the constituent variables that forms factors and can be found in Table S1 of Supplemental Materials.

The traditional vs. industrialized society. Applying Durkheim's framework for mechanical and organic society (1893/1984) to group the variables suggested by CTL theorists (Gelfand et al., 2011; Gelfand, 2012; Pelto, 1968; Triandis, 1989), agricultural employment, urbanization, population density[5], globalization, and income have been factor analyzed. KMO measure of sampling adequacy was .75, and all five variables loaded on a single factor accounting for 54.13% of variance (see Supplemental Materials for more details). The higher scores indicate greater industrialization.

Institutional repression. Democracy, freedom of press, judicial independence, economic freedom and military control were factor analyzed. KMO measure of sampling adequacy was .73, and all five variables loaded on a single factor accounting for 51.52 % of variance (see Supplemental Materials for more details). The higher scores indicate greater institutional repression.

Subjective states.

Feelings of freedom of choice and control. The response at the country level to the following question in EWVS (2006, wave: 2000) was taken as the indicator of feelings of freedom of choice and control: "how much freedom of choice and control you feel you have over the way your life turns out"

Subjective well-being. Subjective well-being was calculated based on the standardized responses to two questions in EWVS (2006, wave: 2000): the degree people feel happy, and satisfied with their life (Cronbach's $\alpha = .83$).

Attitudes toward dissimilar others and deviance.

Willingness to live near dissimilar others. The responses to the following questions in EWVS (2006, wave: 2000) were taken as the indicator of willingness to live near dissimilar others: "On this list are various groups of people. Could you please sort out any that you

[5] Durkheim (1893/1984) foresaw population density to be a precursor to division of labor; hence the industrialized society.

would not like to have as neighbors?". In particular, 6 groups were asked about consistently across waves: people of a different race, heavy drinkers, immigrants/foreign workers, people who have aids, drug addicts, and homosexuals. The responses to these questions were reverse coded and averaged at the country level to come up with a single measure (Cronbach's α = .86).

Tolerance for moral deviations. Following the footsteps of previous researchers (Minkov et al, 2013; Vauclair & Fischer , 2011), MDBS in a different wave of EWVS was partitioned into two components: tolerance for personal-sexual deviations, and tolerance for violation of legal rules. Based on Vauclair and Fischer (2011) and Minkov et al. (2013), tolerance for personal-sexual deviations, compared to tolerance for violation of legal rules, was expected to be more closely related with cultural looseness (see Supplemental Materials for more details).

Behavioral inhibition. Left handedness, variation in personalities, conformity and innovation were factor analyzed. KMO measure of sampling adequacy was .60, and all four variables loaded on a single factor accounting for 40.01% of variance (see Supplemental Materials for more details). Higher scores indicate greater behavioral inhibition.

Other Constructs.

Perception. Gelfand et al. (2011) assessed CTL perceptions of samples of unknown representativeness[6] by asking them to provide ratings to six Likert-type items like "There are many social norms that people are supposed to abide by in this country". I reverse scored the Gelfand index so that the looser a culture is the higher its score on the index.

Traditional/secular–rational values and survival/self-expression values. These values were defined by Inglehart and Baker (2000), and were available in EVWS (2006).

[6] There were originally 33 countries in Gelfand et al.'s measure of perceptions. However, East Germany was excluded from the analysis since there were no other country level data available for East Germany specifically.

Individualism-Collectivism, Uncertainty Avoidance, Power Distance, and Masculinity-Femininity, Indulgence-Restraint. These values were Hofstede's dimensions presented on his website (Hofstede et al., 2010).

Value consensus. This variable was taken from Schwartz and Sagie (2000).

ERS. Greenleaf (1992) recommended content free measurement of ERS. He used items with lowest inter-item correlations from an extensive survey to construct ERS. Following Greenleaf's footstep, I selected questions with minimum inter-item correlations, -.016, among the candidates. The frequency of extreme responses (responses of either 1 or 10) to questions was counted at the individual level. Then, the percentage of extreme responses at the country level was calculated (see Supplemental Materials for more details).

Results[7] and Discussion

CTL is homogeneity in values, norms, behaviors. In the present paper, three different indices of CTL were developed based on the variation of a range of social values and behavioral practices within a society: domain specific index, domain general index, and the combination index. The scores of countries with respect to the three indices of CTL can be seen in Table 1.

All three indices of CTL showed the expected relations with the postulated variables. As put forth in Figure 1 and can be seen in Table 2, threat was positively related to cultural tightness. Because cultures do not change overnight in response to changes in environment, historical threat was a better predictor of CTL. Applying Durkheim's framework for mechanical societies (1893/1984) to sort the predictions of CTL theorists (e.g. Pelto, 1968; Triandis, 1989; Gelfand et al. 2011; Gelfand, 2012), I predicted and found traditional

[7] All the results reported here holds when using untransformed raw scores of the three CTL indices. Also, when countries with the top and bottom 5% of scores on CTL indices are excluded from the analyses, the significant results depicted in Table 2 remain significant, and not significant results remain not significant- with the exception of tolerance for violation of legal rules, which was shown in literature not to be related with cultural level variables (Vauclair & Fischer, 2011).

societies to be tighter, and industrialized societies to be looser. Similarly, both Durkheim (1893/1984) and Gelfand et al. (2011) foresaw more repression in societies where norms are strong. These predictions were reflected as the second component of socio-political context depicted in Figure 1. As can be seen in Table 2, the findings supported those predictions: there was more institutional repression in tight societies.

Regarding the psychological symptoms, the predicted relations in Figure 1 held. They were strongest for the staples of cultural tightness, i.e., those pertaining to attitudes toward dissimilar others and deviance. People in tight societies were less willing to live near dissimilar others. The correlations of CTL indices were stronger for tolerance for personal-sexual deviations than it is for violation of legal rules. This finding was in line with previous literature that showed tolerance for personal-sexual deviations, compared to tolerance for violation of legal rules, to be more closely related to cultural dimensions (Minkov et al., 2013; Vauclair & Fischer, 2011). For the subjective states, the predicted relations hold but less strongly. Recent evidence suggests that the relations between subjective states and socio-cultural variables may be moderated by the nature of habitat as well as the national income (e.g., Van de Vliert, Huang & Levine, 2004; Van de Vliert & Postmes, 2014). To the extent that culture is an adaptation to environmental demands, cultural tightness can, for instance, be positively related to subjective well-being in poor countries with unhospitable environments. In those societies, cultural tightness may increase well-being by helping to instill the much needed sense of order and predictability. The relation of CTL with subjective states needs to be more refined in future research by taking into account the joint influence of environment and income. For the more objective measures of behavioral inhibition, the correlation of CTL was stronger than that of subjective states. In particular, tight societies were characterized by behavioral inhibition.

The correlations with other constructs can be seen in the bottom panel of Table 2. Of the 6 predictions of significant relations of CTL with other constructs, correlations for domain specific and domain general CTL indices were significant for all constructs except power distance. The correlations for combination CTL index were significant for all constructs predicted, and were not significant for other constructs. Attesting to the convergent validity of CTL, cultural looseness was positively related to secular-rational values, self-expression, individualism, and indulgence. It was negatively related to power distance and ERS. Attesting to the divergent validity, CTL was not related to uncertainty avoidance, masculinity, and value consensus.

To test for the predictive validity of *s.d.* based CTL indices, all the above correlations were recalculated after removing the effect of mean level of individualism. Individualism was selected because it is a potent factor explaining host of variables across cultures, and a correlate of CTL. Results can be seen in Table 2. With a few exceptions, the correlations of CTL with all variables of interest remained intact.

To further illustrate the predictive power of CTL, the partial correlation between combination CTL and the two indicators of attitudes toward dissimilar others and deviance, i.e., willingness to live near dissimilar others and tolerance for personal-sexual deviations, were calculated net of historical and current threat, the extent of traditionalism, and institutional repression. Even after controlling for these structural variables, cultural looseness was associated positively with tolerance for personal-sexual deviations, partial r =.312, p = .018, and with willingness to live near dissimilar others, partial r = .450, $p < .001$.

The perception measure, on the other hand, generally showed weak correlations (Table 2, last column). It correlated significantly only with three variables, and did not correlate significantly with the remaining 13 variables that were predicted to be in relation with CTL.

The perception measure was significantly correlated with tolerance for violation of legal rules, while it did not significantly correlate with tolerance for personal-sexual deviations. This finding was in contradiction with previous findings that tolerance for personal-sexual deviations, compared to tolerance for violation of legal rules, was more closely related to cultural dimensions (Minkov et al., 2013; Vauclair & Fischer, 2011). The zero correlation between perception measure and willingness to live near dissimilar others was another flag. In as much as CTL is the strength of norms and tolerance for deviations, one would expect its perceptions to be predictive of willingness to live near people of a different race, heavy drinkers, immigrants/foreign workers, people who have aids, drug addicts, or homosexuals. Moreover, perceptions can deviate substantially from reality (e.g., Prentice, & Miller, 1993; Ross et al., 1977). Indeed, perception of CTL did not correlate with the CTL indices either (Table 2, top panel).

Minkov, Blagoev, and Hofstede (2013) questioned the validity of perceptions of unrepresentative samples to be an indicator of CTL on the grounds that it did not correlate well with measures taken from representative samples tapping overlapping aspects of culture. Aside from the representativeness of samples within countries, the representativeness of the countries within the world can be another important source of concern. A closer look at the perception data reveals that only 12.5 % of the countries represented in perception dataset were from lower-middle or lower income countries according to the World Bank classification of economies (World Bank, 2002, p.231). This is in contrast to the CTL indices, where 41.5-43 % of the countries represented were from lower-middle or lower income countries. The heavy concentration of relatively high income countries in the perception dataset may indicate a restricted range problem partly explaining why many of the theorized relations of CTL, including income, did not hold for perception measure. Given that income modifies the nature of relations between cultural, structural, and psychological variables (e.g.,

Fischer & Van de Vliert, 2011; Van de Vliert, Huang & Levine, 2004), restricted range of countries represented in the perception measure may make it harder to detect theoretically sound relationships.

Perhaps, perception of CTL should be taken for what it is, i.e., a perception measure in upper-middle to high-income countries. From this perspective, these findings were also in line with the false consensus literature (e.g., Ross et al., 1977) and pluralistic ignorance literature (e.g., Prentice & Miller, 1993) in that people are not apt at guessing the prevalence of norms. Further, individual level measures of unrepresentative samples aggregated at the country level necessarily reflect exposure to a biased selection (Schwartz, 2014). CTL is a cultural variable, and its measurement should be at the cultural level rather than individual level. After all, as Schwartz (2014, p. 11) put it, "latent cultural values are characteristics of societies not of individual people" and only data on representative samples can "accurately capture the impact of the prevailing, latent cultural values".

Cultural tightness is homogeneity at the cultural level. Homogeneity in values, norms, and behaviors means there is little deviation in the social norms, values and behavior that people adopt in a society. Heterogeneity in values, norms, and behavior means social norms, values, and behavior are not pervasive, and thus cannot be sanctioned. If a culture has pervasive norms and sanctions deviance from these norms, it has a tight distribution around the mean. In that regard, the cultural tightness is homogeneity in norms, values and behavior. The indices of CTL put forth in the present paper captures cultural tightness by relying on *s.d.* of norms, values and behaviors measured at the cultural level with representative samples. The fact that all three indices correlated well with each other and showed the predicted relationships with variables of interest (Table 2), regardless of whether the CTL scores were used in transformed or raw form and even when the top 5% and bottom 5% of countries were

trimmed off or when the effect of individualism were accounted for, speaks to the robustness of *s.d.* based CTL construct.

Of the three indices, the combination index of CTL surpassed both the domain specific index and the domain general index. The combination CTL not only exhibited stronger correlations with stipulated theoretical correlates of CTL, but also it took the best of domain specific and domain general constructs at the conceptual level. Domain specific construct was based on *s.d.* of responses to five items related with morality. The small number of questions can render domain specific CTL a practical tool when measuring CTL in different samples. However, the shortness of this scale was at the same time a limitation in terms of representation of different value domains that are pertinent for CTL. Domain general construct, on the other hand, encompassed all the possible values represented in the survey. However, its composition in terms of the domains was affected by the sheer number of questions that were available for a particular domain. If a domain, say, work domain, had higher number of questions, it had unavoidably greater weight in the index. The combination CTL overcame both of these limitations. It had greater variety of values represented, and the degree a domain was represented was a function of the relative importance given to that domain in the particular country. While combining best of the two worlds, combination CTL exhibited most consistent pattern in terms of nomological validity as evidenced by its relation to the correlates of CTL**.** These results bring forth combination CTL as the prime measure of CTL.

Taken together, these findings indicate that the present index based on variation in endorsement of cultural values is a valid measure of cultural tightness and looseness. With the CTL index at hand, further theoretical predictions pertaining to the CTL can be tested. For example, the pattern of rankings suggests that CTL may form clusters with respect to religious affiliation. I coded majority religion in a country according to its dominant religious

tradition, i.e., at least 50% of a country's population adhered to this religion (CIA factbook, 2002). Indeed, the canonical correlation between combination CTL and religion was .79 in discriminant function analysis. The most culturally tight societies were Muslims, followed by those from Eastern Religions, Orthodox Christians, Catholics and Protestants. This finding resonates well with Durkheim's conceptualization of religion as the moral cement of mechanical societies (1893/1984).

CTL may predict other variables of interest as well. For instance, CTL may be related to prevalence of different mental illnesses: obsessive/ compulsive disorder can be more prevalent in tight societies, whereas depression can be more prevalent in loose societies. CTL may also be related to attachment. Because people with preoccupied attachment style anxiously seek for approval from others, and because CTL is strongly related with conformity, cultural tightness may be associated with greater prevalence of preoccupied attachment styles.

CTL can be related to spending and consumption patterns: members of tight cultures can have a higher savings rate, and be less likely to adopt new products. CTL may predict risk taking across different domains: since tight cultures prefer stability to change, they may be more risk-averse and loss-averse. Or CTL may predict economic development as much as it is influenced by it. Future studies should investigate these and other antecedents and consequences of CTL.

For cross-cultural psychologists, there is another intriguing possible use of the index of CTL: judging the appropriateness of the assumption that their samples reflect the culture they live in. Ideally, we should all run our cross-cultural studies on representative samples. However, such an approach is not always practical or realistic due to resource constraints. The researcher may need to judge the extent of possible bias in their sample. CTL can be helpful in that regard. Recall that cultural tightness is homogeneity in norms, values and

behavior. To the extent that norms, values, and behaviors are pervasive in a society, it may be safer to assume that convenience samples may reflect cultural influences prevalent in that particular place of the world. However, sampling in looser cultures may require more attention to representativeness since the norms, values, and behaviors in loose cultures show great variability. Even matching samples across countries may not be enough to overcome the problem. In tight cultures, on the other hand, issues with sample selection would not be as alarming since norms, values, and behavior are pervasive.

At the more general level, the method applied in the present research adds to the growing literature that advocates the use of dispersion measures (e.g., Au, 1999; 2000; Au & Cheng, 2004; Fischer & Schwartz, 2011; Huang & Van de Vliert, 2002; Schwartz, 2014; Schwartz & Sagie, 2004; Smith 2004; 2011). In cross-cultural research, the choice statistic for comparison is usually the mean. However, a different sort of information can be gathered by using variance. Without a strong justification, *s.d.* should not be gotten rid of in an attempt to control for ERS or ARS (Fischer, 2004; Fischer & Milfront, 2010). In fact, ERS and *s.d.* can be negatively correlated, as in the case of CTL. The variance statistic in general can be used as a behavioral measure of degree of homogeneity of any value or behavior in supplementing or replacing means of self-reports (cf. Uz, in press). For instance, to gauge perceptions of outgroup homogeneity in the context of intergroup comparisons, one can ask respondents to evaluate specific outgroup members vs. ingroup members and then assess the variation in the responses themselves, rather than asking participants how different outgroup members from each other are. In the present research, the variation in the endorsement of values, norms, and behaviors appeared to be a reasonable measure of CTL. It can hopefully be inspiring to other researchers to study the patterns of variance in different domains.

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Table 1

The CTL scores of countries (most tight=0).

Country	CTL_DS	CTL_DG	CTL_C	Country	CTL_DS	CTL_DG	CTL_C
Albania	22.6	52.9	37.2	Luxemb.**	81.3	111.2	113.9
Algeria	16.7	33	19.2	Macedonia	43.1	85.9	64.3
Argentina	74.5	88.4	75	Malta	15	34.2	28.1
Austria	88.8	68.3	75.8	Mexico	74.7	111.5	74.7
Banglad.*	0	3.5	6.6	Moldova	53.6	57.4	41.9
Belarus	62.3	82.1	60.5	Morocco*	17.6	2.8	0
Belgium**	70.1	126.7	119.8	N. Ireland	62	93.6	74.2
Bos &H.	36.1	64.6	51.9	Netherl.	62.5	61.7	78.9
Bulgaria	54.3	80.8	60.4	Nigeria	14.1	30.7	17.9
Canada	75.7	89.3	84.6	Pakistan	0	4.1	n/a
Chile	66.1	112	86.8	Peru	35.2	66.8	52.3
China	35.3	n/a	n/a	Philippines	49.6	46.6	31.5
Croatia	57.1	61.7	55	Poland	66.6	56.3	42.8
Czech R.	73.3	58.4	59.6	Portugal	51.6	78.6	87.4
Denmark	90.6	40.5	65.5	P. Rico	46.5	68.2	63.1
Egypt*	4.8	0	3.9	Romania	47.5	59	42.4
Estonia	55.6	55.4	55.4	Russian F.	45.8	70.4	57.2
Finland	67.7	72.3	74.5	S.Arabia	15.1	n/a	22.4
France**	66.8	101.3	99.6	Serb & M.	43.4	73.8	61.8
Germany	75.6	74.5	82.9	Singapore	35	n/a	55.2
Great B**	64.3	87.4	89.3	Slovakia	78.4	76.4	59
Greece	60.9	80.8	58.3	Slovenia	109.6	78.5	55.1
Hungary	37.3	61.1	42.8	S. Africa	52.2	110.6	67.6
Iceland	51.1	35.7	51.2	S. Korea	48	28.8	20.1
India	111.8	110.6	43.7	Spain	80.9	96.4	83.9
Indonesia*	2.5	4.2	3.1	Sweden**	63.5	47.3	87.9
Iran	17.8	26.9	31.5	Tanzania	11.7	31.7	31.6
Ireland	52.7	76.8	71.2	Turkey	28.3	29.1	12.5
Italy	62.4	84.6	67.8	Uganda	16	43.4	34.7
Japan	56.8	39.2	43.3	Ukraine	52.6	81.3	56.9
Jordan*	4.2	3.4	5.1	USA	67.9	71.5	58
Kyrgyzs.	34.3	77.6	52.6	Venezuela	39.2	n/a	n/a
Latvia	47.4	54	42.7	Viet Nam	21.8	41.2	35.9
Lithuania	40.3	54.6	54.4	Zimbabwe	4.3	41.5	30.4

Notes. DS: Domain specific, DG: Domain general, C: Combination. *Bottom 5 countries (tight), and **top 5 countries (loose) according to CTL_C ranking.

Table 2

The correlations of CTL, perception of CTL, and other theoretical variables of interest.

	CTL_DS	CTL_DG	CTL_C	Perception
CTL_DS	1	.740***	.724***	.159
CTL_DG	.740***	1	.851***	.296
CTL_C	.724**	.851***	1	.264
Perception	.159	.296	.264	1
Threat				
Historical threat	-.636***	-.476***	-.685***	-.536**
Current threat	-.520***	-.326**[n]	-.514***	-.205
Traditional/industrialized	.549***	.405***	.630***	.151[r]
Institutional repression	-.626***	-.402***[n]	-.639***	-.233[r]
Subjective states				
Subjective well-being	.279*	.196	.376**	[a].032[r]
Feelings of freedom of choice and control	.277*	.230	.314*	.211
Attitudes toward dissimilar others and deviance				
Willingness to live near dissimilar others	.426***	.383**	.675***	[a].080[r]
Tolerance for personal-sexual deviations	.814***	.502***	.723***	.384
Tolerance for violation of legal rules	.236	.447***	.219	.477*
Behavioral inhibition	-.406***	-.369*[n]	-.590***	-.126[r]
Relation to other constructs				
Secular–rational values	.577**	.302*[n]	.448**	.296
Self-expression values	.533**	.281*[n]	.557**	[a].124[r]
Individualism	.411**	.316*	.417**	.429*
Power Distance	-.242[n]	-.038	-.332*[n]	-.349
Indulgence	.263*[n]	.303*[n]	.382**	.219
Uncertainty Avoidance	-.003	.171	.061	[a].322
Masculinity	.043	.141	-.028	.166
Value Consensus	-.297	.093	.100	.143
ERS	-.607***	-.449**	-.558***	-.313

**p < .05; **p < .01; ***p< .001*

[a] *the correlations that failed to show the theoretical relations,*

[n] *the correlations that became non-significant after controlling for individualism,*

[r] *the correlations that reversed direction after controlling for individualism.*

Figure 1

A framework for cultural tightness.