

Supporting Information Appendix for

**Mapping cultural tightness and its links to innovation, urbanization, and
happiness across 31 provinces in China**

Roy Y.J. Chua, Kenneth G. Huang,* Mengzi Jin

* Corresponding author. E-mail: kennethhuang@nus.edu.sg

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Sample and Procedure

We conducted three rounds of data collection in March 2014, April 2017, and July 2017 to avoid respondent fatigue and common method variance. Variables collected in different time periods are listed in Table S2 (see Dataset S1 for raw data). Given that internet and mobile phone is prevalent in China^{*}, we distributed surveys through a Chinese online survey website (Sojump) similar to Amazon Mechanical Turk in the U.S. Users of the survey platform are at least 18 years old, Chinese citizens, and must be residents in China at the time of the survey (account verified through Chinese mobile numbers). We launched our survey online and restricted IP addresses for each round's survey so that each participant can only take the survey of each round once. We paid each participant 15 RMB (approximately 2.50 USD) for completing each survey.

We seek to maximize the sample variance so as to capture the populace diversity of each province by making our survey available to participants of all demographics on the survey platform. Our sample consisted an average of 160 (Round 1), 105 (Round 2), 110 (Round 3) individuals from each province in each respective round of data collection, except for Tibet because of difficulties in getting responses ($N=68$ [Round 1], 105 [Round 2], and 75 [Round 3]). Respondents included professionals (e.g., lawyers, accountant, doctors, scientists, teachers), housewives, corporate executives, and students. 59% of our sample are university degree holders. The respondents' ages ranged from 18 to 69 with an average age of 31.75. 52% of the participants were men.

Because of domestic migration in China, participants resided in a given province may not be originally from that province. We therefore compared our participants' responses based on the length of their residence in each province. Specifically, we calculated the difference

^{*} According to statistics by the Ministry of Industry and Information Technology of the People's Republic of China, in 2017, there are 1.4 billion mobile phone users in China.

between participants' age and their self-report length of residence in a given province. If the difference equals 0, it means that the participant is local (born and raised) in that province. For those whose age is more than their length of residence in the province we created subgroups based on how long they have stayed in a given province. We thus had subgroups composed of those who stayed for less than or equal to 1 year, more than 1 year, more than 2 years, more than 3 years, and so on. Because our main variable of interest is the perception of norms in each province, we tested the mean difference between these groups' perception of cultural tightness (see measures below) and those of locals. We found that the subgroups of non-locals who have lived for more than 3 years in a province did not report significantly different cultural tightness perception than locals (*mean difference*=0.01, *standard error*=0.01, $t(11660)=-0.88$, $P=0.38$). We therefore only included in our analyses participants who reported born and raised in the province and those who have lived in the province for more than 3 years. Our final sample consisted of 11,662 participants with an average length of residence in a given province of 22.44 years. Specific breakdowns of demographics in each province is presented in Table S1.

Sample characteristics. To ensure our sample matches the general Chinese population on demographics (age, gender, and education level), we conducted the following analyses and verified that deviations in our sample from the Chinese population do not have significant effect on tightness perception measure.

Specifically, we first compare our sample's demographics to those of the Chinese population (from the latest National Bureau of Statistics, 2016). In our sample, we have 48% female. According to the Population Census, the gender ratio of male to female is 1.06, i.e., 49% of the population are female. We ran a one-sample t-test and found that our sample's gender distribution is not significantly different from the population gender distribution ($t=1.11$, $P=0.27$).

In our sample, the average age is 31.75 (± 9 years) and the median age is 30. Because in the Population Census of People's Republic of China, only population per age group is available, we are only able to use the median age of the population (i.e., 37 years old) as comparison. Using one-sample median test (Wilcoxon Signed Rank test), we found that the median age of our sample is indeed different from the population median age ($P < 0.001$). However, this deviation from the population age is expected. In the population census, all age groups are surveyed including the infants, the minors, as well as the elderly. We were not able to collect data from people of these age groups due to ethics requirements by the institutional review board (IRB) and the sample restrictions of the online survey panel. Next, we test whether our sample's deviation from the population age has any influence on people's tightness perceptions of their provinces. We regressed tightness perceptions on participants' age while controlling for the length of their residency in the province and including a fixed-effect of the province they are in. The results showed that age is not a significant predictor on tightness perceptions ($b = 0.001$, 95%CI[-0.0003, 0.003], $P = 0.12$). Therefore, although our sample age differs from the population age, this difference is unlikely to affect tightness perceptions of the local people in a given province.

Additionally, we tested for the representativeness of the education levels of our sample. In our sample, 59% of the participants hold bachelors' degrees or are in the progress of pursuing one. This percentage is significantly higher than the population percentage of 35.9 (National Bureau of Statistics report and the report from the Ministry of Education of the People's Republic of China, 2014). Same as the analyses on age, we ran a fixed-effect model for the relationship between tightness perceptions and people's levels of education while controlling for age and year of the length of their residency. We found that there is no significant association between education and their perceptions of cultural tightness ($b = 0.005$, 95%CI[-0.01, 0.02], $P = 0.55$). Thus, education level does not appear to predict people's perceptions of

their provinces' cultural tightness.

Finally, we checked if age and education level discrepancies between our sample and the population distribution predict tightness. Specifically, we obtained the average age of each province from the latest population census data (2010) and then calculated the discrepancies of age by subtracting our sample's average age at the province level from the population's average age of each province. We then regress tightness scores at the province level on age discrepancies. Results indicate that age discrepancies between our sample and the population within a province do not predict tightness ($b=-0.42$, 95%CI[-1.13, 0.27], $P=0.22$).

Similarly, we took the data on percentage of people with higher education (diploma, bachelor's, master's and doctoral) of each province from the latest population census and calculated discrepancies by subtracting higher education percentage of population from our sample's higher education percentage for each province. Again, we found that this discrepancy does not predict tightness scores at the province level ($b=0.02$, 95%CI[-0.01, 0.05], $P=0.12$).

Taken together, these above analyses suggest that demographic differences between our sample and the general population do not materially affect our measure of cultural tightness.

Measures

Cultural Tightness. In all three rounds of data collection, we measured cultural tightness using the six-item Likert scale developed by Gelfand and colleagues (1). Sample items include "In this province, people almost always comply with social norms" and "In this province, there are very clear expectations for how people should act in most situations" on the six-point Likert scale (1="strongly disagree" to 6="strongly agree"). We translated the items into Chinese and back-translated into English (2). Discrepancies between the original version and the back-translated version of the questionnaires were discussed and resolved by selecting the most

straightforward and understandable version. Preliminary analyses indicated that the scale has good reliability (Cronbach's alpha=0.71).

Consistent with the prior comparison among 33 different nations made by Gelfand et al. (1), our results showed that perceived cultural tightness in each province in China is indeed a collective phenomenon. We calculated inter-member agreement for each province. Because cultural tightness scale has multiple items, we used $r_{wg(j)}$ index (3). This measure captures the extent to which members of a province agree in their ratings. A higher agreement means members in a province share the experience of cultural tightness. Specifically, we used the equation below to calculate inter-member agreement:

$$r_{wg(j)} = \frac{J[1 - (\overline{S^2_{XJ}}/\sigma_{EU}^2)]}{J[1 - (\overline{S^2_{XJ}}/\sigma_{EU}^2)] + (\overline{S^2_{XJ}}/\sigma_{EU}^2)}$$

In this equation, J is the number of items in the scale. The agreement variance is calculated as relative to the theoretical (expected) random variance: σ_{EU}^2 . The term σ_{EU}^2 refers to expected error variance based on a uniform distribution, thus is determined by two factors: number of response options for the scale- A (in the case of tightness scale: 6); and expected distribution of random responses, and for a uniform distribution $\sigma_{EU}^2 = (A^2-1)/12$. In our tightness measure: σ_{EU}^2 is 2.92. $\overline{S^2_{XJ}}$ is the average of observed variances on J 's items. For cultural tightness, we found that across provinces, *Mean* $r_{wg(j)}$ =0.87 and *Median* $r_{wg(j)}$ =0.88, exceeding the recommended cut-off value for aggregation for $r_{wg(j)}$ =0.70 (4).

Because agreement within a province is only relevant for the variability of ratings within the province, it does not capture the variance relative to other provinces, we also calculated inter-member reliability indices (5). Inter-member reliability captures the relative consistency of responses across members of a given province. A higher level of inter-member reliability means the ratings are consistently different across provinces, i.e. variance within the province is smaller compared with between-province variance. There are two forms of the

intra-class correlation coefficient to measure the variance within provinces and variance between provinces: $ICC(1)$ and $ICC(2)$.

$$ICC(1) = \frac{MSB - MSW}{MSB + [(k - 1) * MSW]}$$

and

$$ICC(2) = \frac{MSB - MSW}{MSB}$$

Both $ICC(1)$ and $ICC(2)$ are calculated from one-way random-effects ANOVA where the variable of interest (cultural tightness) is defined as the dependent variable, and the unit membership (province) is the independent variable. In this equation, k refers to the average members in each unit (province), MSB refers to between-province variance (between-unit mean squares) and MSW refers to within-province variance (within-unit mean squares). $ICC(1)$ is the proportion of variance in ratings due to province membership, and it directly indicates the extent to which variability within province is smaller relative to variability between provinces. F-test from ANOVA indicates a significant level for $ICC(1)$: $ICC(1)=0.04$, $F(30, 11631)=13.81$, $P<0.001$. $ICC(2)$ refers to the reliability of provincial level means, and it indicates whether provincial level means can be used reliably to differentiate between provinces. We found that $ICC(2)=0.93$, which exceeds the recommended cut-off value of 0.70 (4).

The above statistics support the aggregation of cultural tightness perception measure to the provincial level. We thus calculated the average of cultural tightness for each province. The measure of tightness at provincial-level for the three rounds of data collection are highly correlated at the provincial-level (Round 1 and Round 2: correlation =0.63, 95%CI[0.32, 0.79], $P<0.001$; Round 2 and Round 3: correlation=0.51, 95%CI[0.13, 0.70], $P=0.004$; Round 1 and Round 3: correlation=0.52, 95%CI[0.21, 0.74], $P=0.003$). This result suggests good test-retest

reliability of tightness at the provincial-level. In our subsequent analyses, we used the combined data from all three rounds of data collection.

Following previous research on cultural tightness (1, 6), we transformed tightness scores in China across provinces to render the scores easier to interpret. We standardized the tightness scores among all provinces (z-scores), and we added 3 to all the provinces' scores. After this transformation, cultural tightness at the provincial level ranged from 0.85 to 5.00. Table S1 shows the average score of tightness-looseness of social norm in each province.

Happiness. We adopted two measures for happiness. In Round 1, we operationalized happiness as an affect. Specifically, we measured participants' positive and negative affect experienced the day before they took the survey. We asked participants if they had experienced the following emotions *yesterday* (happiness, laughter, joy, sadness, anger, and worry) (0="no", 1="yes"). In both Round 1 and Round 2, we also measured happiness using a measure of life satisfaction—the Cantril Ladder scale (7). Participants were instructed to rate their current life state by imagining their life is on a ladder with the highest point (10) representing the best possible life to the lowest (0) representing the worst possible life.

Perception of government control. We measured participants' perception of government control via the item. "To what extent do you feel governmental practices influence your daily life" (1="not at all" to 6="to a great extent").

Perception of tolerance toward LGBT. We measured participants' perception on how tolerant the province is toward lesbians, gays, bisexuals and transgender using the item "To what extent are people in your province tolerant towards lesbians, gays, bisexuals and transgender" (1="not at all" to 6="to a great extent").

Perception of religious practice. We also measured the extent to which religious practice is prevalent in their daily lives with one item "To what extent are religious practices prevalent in people's life in your province" (1="not at all" to 6="to a great extent"). A

multilevel regression found that provincial level cultural tightness is positively related to individual's perception of religious practice although the effect is not statistically significant ($\gamma = 0.07$, 95%CI[- 0.04, 0.18], $P = 0.24$).

GLOBE societal cultures. In Round 2, we collected perceived descriptive cultures of each province featuring four cultural dimensions: relational collectivism, group collectivism, power distance, and uncertainty avoidance. We followed the GLOBE project (8) in asking participants about their perceptions of their province's culture "as is" instead of what they think it should be. We adopted the measures of these four cultural dimensions at the societal level from the GLOBE questionnaires (Beta). The scales are seven-point Likert with different anchor instructions. Sample items include "In this province, children generally live at home with their parents until they get married" (relational collectivism), "In this province, group cohesion is valued more than individualism" (group collectivism), "In this province, rank and position in the hierarchy have special privileges" (power distance), "In this province, most people lead highly structured lives with few unexpected events" (uncertainty avoidance). The four scales showed reasonable reliability (relational collectivism: $\alpha=0.72$, group collectivism: $\alpha=0.63$, power distance: $\alpha=0.76$; uncertainty avoidance: $\alpha=0.73$).

Traditionality. In addition to descriptive culture, we measured the extent to which people endorse traditional Chinese cultural values. We used the five-item traditionality scale developed by Farh, Earley, and Lin (9). Sample items include "The best way to avoid mistakes is to follow the instructions of senior persons" and "Those who are respected by parents should be respected by their children" (1="strongly disagree" to 5="strongly agree"). The scale has good reliability (Cronbach's $\alpha=0.76$).

Behavioral \times situation constraints. Following Gelfand et al. (1), we developed behavioral constraints measures for the Chinese context. Specifically, we first identified 10 everyday situations where their level of situational strength is likely to vary in China

(classroom, hospitals, elevators, on buses, on airplanes or trains, movie theatres, on the street, restaurants, shopping malls, parks). We then asked participants to what extent they think each of the following 7 behaviors (eat, play music out aloud, litter, publicly display affection, swear, allow pets and kids to defecate, smoke) is appropriate in each of the situations on the six point scale (1="not appropriate at all" to 6="very appropriate"). The lower the score, the higher the constraint for each behavior in a given situation.

Big-Five Personality. We expect cultural tightness to influence people's personality. We measured Big-Five personality (extraversion, agreeableness, openness to experiences, conscientiousness, neuroticism) with a short 10-item scale (10). Participants were presented with 10 sets of adjectives describing personalities sample items that include "Extraverted, enthusiastic" (extraversion) or "sympathetic, warm" (agreeableness). Participants rated to what extent they agree each of the characteristic applies to them (1="strongly disagree" to 7="strongly agree").

Self-monitoring. One of the ways through which a tight culture affects social behavior is the extent to which people monitor their own behaviors (11). We measured self-monitoring with Snyder and Gangestad's scale (11). Participants read 18 statements describing hypothetical situations and behaviors. They were asked to rate whether the description applies to them. Sample items include "In different situations and with different people, I often act like very differently" and "I can only argue for ideas which I already believe (reverse coded)" (1="True", 0="False"). Cronbach's alpha for this scale is 0.77. A higher value means greater self-monitoring.

Innovation-related thinking styles. We expect that people living in tight culture develop more innovation-relevant thinking styles compared with those living in loose culture. Kirton (12) categorizes people's thinking styles in terms of whether they are adaptor-alike, defined as those who prefer "doing things better" or innovators-alike, referred to those who prefer to "do

things differently”. In addition, according to Kirton (12), the adaptor-innovator thinking styles has three sub-dimensions: originality-driven (creativity), efficiency-driven (reliability and precision), and conformity-driven (“rule-followers” and “fitters-in”). We assessed adaptor-innovator thinking style with 32 items originally developed by Kirton (12). Sample items include “I need the stimulation of frequent changes”, “I often risk doing things differently” (originality dimension, Cronbach’s alpha=0.87); “I master all details painstakingly” “I am methodical and systematic” (efficiency dimension, Cronbach’s alpha=0.82); “I conform”, “I fit readily into ‘the system’” (conformity dimension: Cronbach’s alpha=0.79). Participants rated if each of the items accurately described their preferences (1= “strongly disagree” to 5=“strongly agree”). An overall score for adaptor-innovator thinking style is derived by reverse coding the conformity and efficiency scores and adding them to the originality scores. The scale combining the three sub-dimensions yields good reliability (Cronbach’s alpha=0.91). The higher the score the higher an individual’s innovative thinking.

Innovation. We operationalized innovation using patent data. We collected the entire set of patent data from the State and Intellectual Property Office of China (SIPO) which includes about 3.85 million granted patents between 1990 and 2013 for analysis. Following prior studies (13, 14), we focus on two distinct classes of patents in the Chinese patenting system: invention patents and utility model patents. Invention patents relate to substantive and sometimes radical innovations as they are granted for major discoveries and inventions of technology and products. To be granted an invention patent by the SIPO, the level of inventiveness must be high—incorporating prominent substantive features, ideas or functions that represent “notable progress” as compared to existing technology before the date of filing. Conversely, utility model patents represent more incremental innovations and marginal improvements as they are granted primarily for refinements and modification to shapes and

structures of existing technology and products, and the level of inventiveness required by the SIPO is much lower.

Results

1. Divergent validity

We first attempt to establish divergent validity between cultural tightness and other cultural values (Table S3). We did not find evidence that these cultural values are shared perceptions at the provincial level. Specifically, we calculated aggregation statistics for the four cultural values perceptions and found that there is less within-province variances compared with between-province variances (group collectivism: ICC(1)=0.02, ICC(2)=0.64, mean r_{wg} =0.45, median r_{wg} =0.45; relational collectivism: ICC(1)=0.03, ICC(2)=0.78, mean r_{wg} =0.48, median r_{wg} =0.47; power distance: ICC(1)=0.01, ICC(2)=0.59, mean r_{wg} =0.07, median r_{wg} =0.04; uncertainty avoidance: ICC(1)=0.01, ICC(2)=0.56, mean r_{wg} =0.46, median r_{wg} =0.46; traditionality: ICC(1)=0.01, ICC(2)=0.55, mean r_{wg} =0.57, median r_{wg} =0.57). These findings are important because it suggests that, unlike cultural tightness perception, these cultural values may not be provincial level phenomenon. Indeed, Talhelm and colleagues (15) found that collectivism is related to agricultural areas and can vary within a province. Similarly, previous findings suggest that the collectivism in China might differ more based on a north-south divide than by province (16).

With regards to divergent validity, our findings in Table S3 showed that cultural tightness is only moderately correlated with key cultural value dimensions in the expected direction (group collectivism: $r=0.21$, 95%CI[0.18, 0.25], $P<0.001$, relational collectivism: $r=0.05$, 95%CI[0.02, 0.09], $P=0.003$, power distance[†]: $r=-0.23$, 95%CI[-0.27, -0.20], $P<0.001$,

[†] Gelfand et al. (1) did not find any significant correlation between cultural tightness and power distance in their global data. It is interesting that power distance is negatively correlated with cultural tightness in China. This negative correlation is however consistent with our other findings that cultural tightness is related to urbanization.

uncertainty avoidance: $r=0.23$, 95% CI[0.19, 0.26], $P<0.001$, and traditionality: $r=0.22$, 95%CI[0.19, 0.26], $P<0.001$). Hence, our measure of cultural distance is sufficiently distinct from these cultural values.

2. Convergent validity

We conducted additional analyses and found that for provinces that are tighter, their inter-member agreement (r_{wg}) regarding the cultural norms are indeed higher ($r=0.66$, 95%CI[0.37, 0.81], $P<0.001$). This finding is consistent with theories of cultural tightness in that tight cultures tend to have stronger agreement on what behaviors are permissible (1, 17).

Prior research and theory suggest that tighter cultures impose greater behavioral constraints on their people (1, 18). Thus, whether certain types of behaviors are considered as appropriate in a given situation should vary as a function of tightness versus looseness among provinces. We analyzed how provincial level tightness correlate with perceived constraints for 70 behavior-situation scenarios. Following previous research at the national level (1), we combined behaviors across situations to capture a broader construct of situation constraints (Table S4), the extent to which multiple behaviors are considered as inappropriate in a given situation. We found that the coefficient correlation between cultural tightness and various situations ranges from -0.04 to -0.12[‡] with the average p-value of 0.0001.

We collected other provincial level archival variables to further establish convergent validity (Table S5). Specifically, we collected data on population, natural resources, environment, geography, threats, health, and social economic factors. For contemporary data, we aimed to use the most recent data available but because different statistics were gathered

Highly urbanized provinces might have more sophisticated governance structures where power is more distributed rather than concentrated .

[‡] The small correlations in Table S4 could be due to the fact that the individual behavioral constraint measures are trivial daily behaviors (e.g., smoking or eating in public) that do not necessarily attract significant punishments when violated. In addition, previous research suggests that for specific or narrow outcome variables, the broader the predictors are, the less predictive power the predictors have (26–28). Our correlation coefficient sizes (ranging from -0.04 to -0.12 for specific behaviors in one given situation) are consistent with the findings that culture is moderately correlated with individual-level outcomes (29).

and released by different government departments at different time points, the most recent year for available data varies for different variables. For example, population density and rural population density are most recently updated in the National Bureau of Statistics of the People's Republic of China in 2016, whereas the most recent Minority population data was released in China's Ethnic Statistical Yearbook in 2014, and data on percentage of residents that have "Hukou" from outside the province was released in China Six Population Census in 2010. For historical data, we used the earliest relevant data. For example, for historical population density, because China's provincial regions changed through different dynasties we found the most complete historical provincial level population data documented in Year 1749 (N=18) from the book "China Historical Population Data and the Relevant studies" (19).

Following prior study that maps cultural tightness at the global level (1), we presented partial correlation between cultural tightness and other provincial level variables controlling for provincial level GDP per capita. In addition, study of cultural tightness in U.S. adopted a bivariate correlation approach, thus for comparison (6), we also presented bivariate correlations between cultural tightness and other provincial level variables.

Because crime data in China at the provincial level is not publicly available, we collected indirect indicators (trust) to show convergent validity with cultural tightness at the provincial level. When a society is tight, behaviors should be more regulated and predictable, thus people from the society should be trusted more by others. Indeed, when we linked tightness at the provincial level with a Chinese survey measuring trust in people from different provinces (20), we found people from culturally tight provinces are trusted more by people from other provinces ($r=0.68$, 95%CI[0.43, 0.83], $P<0.001$). In addition, in the Chinese General Social Survey (2013) (21), people were asked to what extent they trusted strangers in their society (question b6). We aggregated this variable to the provincial level (ICC(1)=0.07, ICC(2)=0.95, $F(27, 6803)=19.98$, $P<0.001$), *Mean* $r_{wg}=0.61$, *Median* $r_{wg}=0.61$). To the extent that a society

is loose and has weak social norms regulating behaviors, people should have lower trust propensity towards strangers. Indeed, we found that this trust propensity correlates positively with tightness such that in tighter provinces people showed more trust towards strangers ($r=0.40$, 95%CI[0.03, 0.67], $P=0.03$).

3. Impact on innovation

Tables S6 and 1 present the correlations and regression analyses respectively for cultural tightness's impact on patents. Specifically in Table 1, we performed ordinary least squares (OLS) regression which provides a more direct interpretation of the results. We employed robust standard errors to account for possible heteroscedasticity and lack of normality in the error terms. In addition, we clustered by provincial-level regions to account for possible correlations in the errors for patents granted in each provincial-level region. In Models 1-1 and 1-2, our dependent variable is the number of granted "utility model patents per scientist and engineer" by provincial-level region in a given year. In Models 2-1 and 2-2, our dependent variable is the number of granted "invention patents per scientist and engineer" by region in a given year.

To more fully understand the relationship between cultural tightness and the production of innovations at the provincial-level regions, we need to account for each province's different levels of economic development (i.e., GDP per capita), accumulated innovative capability (e.g., cumulative patents per scientist and engineer), scientific and engineering human resources (i.e., scientist and engineer per capita), funding for education, science and technology (S&T) (i.e., education spending per GDP, university S&T funding per GDP, national program funding per GDP), financial resources allocated for R&D (enterprise R&D per total R&D, university R&D per total R&D), and foreign investment (FDI per GDP). This is because the effect of cultural tightness on production of innovation is likely to vary depending on the level of economic development, innovative capability, scientific and human resources, funding for education,

S&T and innovation, and financial resources available in a provincial region for each year. Hence, it would be important to include these control variables, which we describe in detail below. We collected and computed these variables from the China Statistical Yearbook (1991–2015) and the China Statistical Yearbook on Science and Technology (1991–2015). The China Statistical Yearbook published in any given year captures data primarily from the previous year. For example, Yearbook 1991 mostly captures data from the year 1990. Occasionally, the China Statistical Yearbook captures data from two years ago. Hence, Yearbook 2015 is required to obtain the complete set of data fields from 2013. The China Statistical Yearbook on Science and Technology began in the year 1991. Therefore, the data obtained from this source are only available from the year 1990.

We included the following normalized control variables at the provincial-level region in a given year. First, we included the variable “GDP per capita” at the provincial level, which allows us to control for the economic output of each provincial level region, taking into account its population. The variable “scientist and engineer per capita” measures the number of full-time technical personnel available to generate innovation output as a proportion of the population in the region. We controlled for this variable because a higher level of input in human resources, i.e., technical expertise who contributes directly to the production of innovation, tends to yield higher level of substantive innovation output in the form of patents. The variable “cumulative patents per scientist and engineer” denotes the total number of patents per scientist and engineer in a provincial level region accumulated since the start of our observation, i.e. year 1990, until the year before the current year of observation. It provides a proxy for the innovative capability of the scientist and engineer in the region. We controlled for this variable because scientists and engineers with stronger innovative capability based on their prior innovation performance tend to produce more invention patents as well as utility model patents, making this variable a good predictor of “invention patents per scientist and

engineer” and “utility model patents per scientist and engineer”. “Education spending per GDP” controls for the amount of education spending as a proportion of GDP in a region which is an important factor affecting the number of technical personnel produced in a region. Total R&D expenditure in a region largely consists of R&D expenditure from enterprises/firms, universities and research institutes. The variable “enterprise R&D per total R&D” controls for the amount of enterprise/firm R&D expenditure as a proportion of total R&D expenditure in a region. The variable “university R&D per total R&D” controls for the amount of university R&D expenditure as a proportion of total R&D expenditure. A higher level of input of financial and R&D resources by enterprises, firms, and universities places an emphasis on innovation and commercialization, yielding higher level of innovation output in the form of patents. Together these two variables account for the relative weight of enterprise/firm R&D versus university R&D in generating patented innovation in a region. “University S&T funding per GDP” captures the funding for S&T in university from government as a proportion of GDP in the region. It is an important control variable as government funding and grants allocated to universities is an important source of funding for S&T activities in universities which could influence S&T trajectories and the number of patented innovations produced by scientists and engineers[§]. “National program funding per GDP” controls for the funding for major national program for R&D and innovation (such as the torch program, sparkle program, achievements spreading program) as a proportion of provincial level GDP. Such major external funding from the government especially in the context of China where government directs and funds important innovation programs could have a significant impact on the level of innovation output in the region and should be controlled for. Finally, we included “FDI per GDP” which

[§] We reanalyzed our models in Table 1 with only one of the two variables (university S&T funding per GDP and scientist and engineer per capita). Specifically, we replicated each of the Models 1-1, 1-2, 2-1, 2-2 in Table 1 in turn (first without “scientist and engineer per capita”, then without “university S&T funding per GDP”). Effects in the regressions above are similar and consistent with those of Model 1-1, 1-2, 2-1, 2-2 respectively. (Detailed regression results are available upon request.)

controls for the amount of FDI (foreign direct investment) as a proportion of GDP in a region. This allows us to control for the extent of foreign investment and activity on innovation output produced in a given region.

As shown in Table 1, in the main Models 1-1 and 2-1 we included the entire range of years of observation from 1990 to 2013. In Models 1-2 and 2-2, as a robustness analysis, we restricted our analysis to the more recent years between 1999 and 2013. Results in Model 1-1 indicate a positive and significant relationship between cultural tightness and utility model patents which provides a proxy for incremental innovations ($b=0.004$, 95%CI [0.001, 0.007], $P<0.001$). The R-squared statistic is reasonably high at about 0.62, suggesting that the regression model has accounted for about 62% of the variance. Model 2-1 shows a negative and significant relationship between cultural tightness and invention patents (i.e., representing more substantive or radical innovations) ($b=-0.001$, 95%CI[-0.001, 0.000], $P=0.05$). The R-squared statistic is 0.65, suggesting that the regression model has accounted for about 65% of the variance

As a robustness check, we performed the same analyses using more recent year patents (1999 to 2013) and found consistent results: Model 1-2 shows a positive and significant relationship between cultural tightness and utility model patents ($b=0.003$, 95%CI[0.000, 0.006], $P=0.04$). This result suggests that for every unit increase in cultural tightness, there is on the average an increase of 231 patents produced by scientists and engineers in a province. The R-squared statistic of 0.67 is reasonably high. Model 2-2 suggests a negative and significant relationship between cultural tightness and invention patents ($b=-0.001$, 95%CI[-0.002, -0.000], $P=0.007$). This result suggests that for every unit increase in cultural tightness,

there is on the average a decrease of 77 patents produced by scientists and engineer in a province. The R-squared statistic of 0.70 is again reasonably high**.

For analyses that crosses two different levels (provincial level and individual level, i.e., Table 2 and S7), because our predictor variable – provincial cultural tightness is at the higher level (provincial-level), which does not vary across individuals within a province, and our outcome variables – psychological outcomes are at the lower level (individual level), we adopted multilevel modeling (MLM) for analyses. MLM is more appropriate than the traditional ordinary least squares (OLS) techniques (e.g. fixed-effects) because we are estimating group-level effects simultaneously with the effects of the group-level predictor. In a multilevel model, error terms in a regression (unexplained variance) is structured according to the levels of analyses. Therefore, in an MLM (assuming for normal distribution and robustness to deviation from the normal distribution), the correct standard errors can efficiently weigh both between- and within- group variation to generate the estimated effect based on the residual variances both within- and between- groups. For our MLM models listed in Table 2 and S7, we regressed the level-1 outcomes: adaptor-innovator thinking styles, personality, happiness, and perceptions of governmental control, LGBT tolerance, and religious practices in daily life on the level-2 predictor: provincial level tightness. Specifically, we build the following models for each of the individual-level outcome variable:

$$\text{Level-1: } Y_{ij} = \beta_{0j} + r_{ij}$$

$$\text{Level-2: } \beta_{0j} = \gamma_{00} + \gamma_{01} * X + U_{0j}$$

In this equation, i refers to the ith participant and j refers to the jth province. β_{0j} is the Level 1 intercept. r refers to Level 1 errors, its variance referred to the individual-level variance

** We computed VIF after running Model 1-1 and Model 2-1 in Table 1. None of the variables has a VIF higher than 10 in both models. We also computed VIF after running Model 1-2 and Model 2-2. Only “scientist and engineer per capita” in Model 1-2 and Model 2-1 has a VIF higher than 10. However, because this variable is not statistically significant in both these regression models, excluding this variable from the model yields the same results.

not explained by the model. γ_{01} refers to the Level 2 intercepts. γ_{01} refers to the Level 2 regression coefficients and U_{0j} refers to the Level 2 errors. When the γ s are significant in the above tested models, it can be interpreted as that provincial level tightness (variable X) explains a significant amount of variance in individual level outcomes (e.g., happiness, adaptor-innovator thinking styles).

Consistently, we found that cultural tightness at the provincial level is negatively associated with innovative thinking ($\gamma=-0.02$, 95%CI[-0.03, -0.01], $P=0.01$ for locals only and $\gamma=-0.01$, 95%CI[-0.02, -0.0003], $P=0.04$ for the full sample). Further analyses showed that people from tighter provinces are more likely to emphasize the efficiency sub-dimension of Kirton's (12) adaptor-innovator thinking style ($\gamma=0.04$, 95%CI[0.004, 0.07], $P=0.03$ for locals only and $\gamma=0.04$, 95%CI[0.02, 0.06], $P=0.001$ for the full sample) (Table S7). Cultural tightness itself did not seem to implicate the originality sub-dimension ($\gamma=-0.01$, 95%CI[-0.04, 0.02], $P=0.54$ for locals only and $\gamma=0.01$, 95%CI[-0.01, 0.04], $P=0.27$ for full sample). Our findings also reveal that cultural tightness has a weak positive association with conformity-related thinking (conformity sub-dimension: $\gamma=0.02$, 95%CI[-0.01, 0.05], $P=0.19$ for locals only and $\gamma=0.01$, 95%CI[-0.01, 0.03], $P=0.23$ for the full sample). These findings explain why cultural tightness appears to promote incremental innovation but hurt radical innovation in China. Individuals in culturally tight societies are socialized to favor control, consistency, detail orientation, graduality, and fitting in, over doing things differently during the problem solving process.

Cultural tightness does not appear to be associated with entrepreneurship activities ($\gamma=-0.15$, 95%CI[-0.35, 0.04], $P=0.12$ for locals only and $\gamma=-0.05$, 95%CI[-0.17, 0.08], $P=0.49$ for full sample) although the effects are negative. In comparison, Harrington et al., (6) found that cultural tightness in the U.S. is negatively associated with number of women-owned firms ($r=-0.26$, $P=0.06$).

4. Impact on Personality

We ran multi-level regression with provincial level tightness as the predictor on Big-Five personality and happiness variables (Table 2). Results indicate that cultural tightness at the provincial level is negatively associated with openness to experiences and positively associated with conscientiousness. These results are consistent with those in the U.S. (6). However, contrary to the U.S. findings, we found that tightness is negatively associated with extraversion. This finding is consistent with theories of cultural tightness, given that extroverted people have been shown to take more social risks compared with introverted people (22). In tight provinces (cities) with strong norms and punishment for deviant behaviors, people are socialized to take less risk, thus less likely to be extraverted in such societies.

5. Urbanization as the Key Driver

Urbanization at the provincial level may drive cultural tightness perceptions of people in a given province due to extensive governmental control for the urbanized provinces; at the same time, urbanization at the provincial-level leads to more liberal political attitudes among people of a province, such as increased tolerance towards LGBT groups because of greater exposure to the outside world. Thus, these liberal attitudes should be positively related to tightness perceptions at the individual level. We conducted multi-level structural equation modeling using Mplus 8.0. We tested a path model specifying that urbanization at the provincial level has an indirect effect to people's tightness perceptions through governmental control at the provincial level. At the same time, urbanization of a province also has a positive effect on people's liberal attitudes. Between the two outcome variables of liberal attitudes and tightness perceptions, they shared common variance and are thus positively correlated (see Figure S1). Results suggest that this model has a good fit: CFI:0.98, RMSEA:0.03, χ^2/df :376.99/40. We also found that our hypothesized model is a better fit than alternative models wherein liberal attitudes are directly affected by governmental control at the provincial

level (CFI=0.95, RMSEA=0.05, $\chi^2/df=1057.49/43$); or where liberal attitudes are directly affected by tightness perception at the individual level (CFI=0.97, RMSEA=0.04, $\chi^2/df=737.86/47$).

6. Impact on Happiness

We found that cultural tightness at the provincial level in China affects participants' self-report life satisfaction, positive affect, and negative affect. However, because our data is cross-sectional, we face the potential issue of endogeneity between tightness and these outcome variables. For example, people who have more positive experiences in daily life might attribute these experiences to strong social norms and reinforcement of punishment systems whereas those who had negative experiences in daily life might attribute these experiences to lack of social orders or reinforcement of rules or regulations. To address this issue, we first ran the Durbin-Wu-Hausman test for endogeneity. Results from the two-stage least squares (2SLS) estimation suggest that the null hypotheses that cultural tightness is exogenous to life satisfaction ($F(1,30)=0.71, P=0.41$), positive affect ($F(1,30)=1.03, P=0.32$), and negative affect ($F(1,30)=0.02, P=0.88$) is not rejected. Therefore, we can treat the cultural tightness as exogenous in these cases.

As a further check, we conducted instrumental variable regression to address the possibility of endogeneity between cultural tightness and the happiness outcome variables i.e. life satisfaction. For an instrumental variable to be valid, it needs to be correlated with the independent variable and not correlated with the error term in the regressions examining the dependent variable (23, 24). Therefore, in our study, we need to find a suitable instrumental variable that (i) correlates with provincial tightness (relevance requirement), and (ii) does not correlate with people's happiness experiences (exclusion condition). To ensure robustness, we identified two instrumental variables which respectively capture the number of lawyers per capita and the percentage of the area in a province occupied by Japan during World War II.

The first variable, *lawyers per capita*, provides a proxy for the strength of law enforcement in a focal province, which leads to a tighter cultural norm in the province (relevance requirement). There is, however, no clear theoretical (or practical) reason why the number of lawyers in a province would directly influence people's experienced affect, happiness and life satisfaction (exclusion condition). The second variable, *percentage area occupied by Japan during World War II*, conditions the people living in the province to be more alert and aware of the external invasion threats, reinforcing a tight cultural norm that might be passed from generation to generation (relevance requirement). Because being occupied during World War II is a historically distant event (more than 60 years ago), it should not influence current residents' happiness experiences (exclusion condition).

Next, we describe the results of the instrumental variables regression analyses used to address potential endogeneity issue. Specifically, we conducted 2SLS regression analyses (in STATA) and established the strength of our instrumental variables (results reported in Table S9 in the Supporting Information Appendix). Our results suggested the tests of F statistics for *percentage area occupied by Japan during World War II* ($F(1, 30)=22.30$) and *lawyers per capita* ($F(1, 30)=12.87$) both passed the recommended value of 10 (25), which provide evidence of strong instruments. In the second stage, we found our results still hold—i.e., *cultural tightness* remains as a significant predictor to *life satisfaction*. The results of these instrumental variable regression analyses lend further support to our theorized relationship between cultural tightness and life satisfaction.

Finally, it is worthwhile checking whether the effect that across province variation in culture tightness is positively related to experienced happiness is influenced by provincial level variation in interdependence (15). Thus, we conducted additional analyses to see whether the positive link between tightness and happiness is stronger in people who endorse more interdependence values. Because Talhelm et al. (15)'s data is incomplete for all provinces (they

have data for 27 provinces), we instead tested this prediction with World Value Survey China Wave VI (2013). In this survey, 2,300 Chinese participants from all 31 provinces responded to the Schwartz values survey (variables of interests are: importance of family- item V4, importance of friends – item V5, and general happiness with life – item V10). The aggregated score of importance of family and friends is used as a proxy for interdependence ($r=0.32$, 95%CI[0.29, 0.37], $P<0.001$). We then ran a cross-level moderation model where we use perceived importance of family and friends as a moderator for the relationship between cultural tightness and general life happiness (cultural tightness is operationalized at level 2 whereas importance of family and friends is operationalized at level 1). We found that the cross-level interaction is significant ($\gamma=-0.09$, 95%CI[-0.17, -0.02], $P=0.02$). Specifically, when individuals reported that family and friends are important to them (+1 SD above the mean), tightness is positively related to happiness ($\gamma=0.05$, 95%CI[0.001, 0.10], $P=0.04$); conversely when family and friends are not as important to respondents (-1 SD below the mean), tightness at the provincial-level is not significantly related to happiness ($\gamma=-0.02$, 95%CI[-0.06, 0.03], $P=0.49$). These findings suggest that in societies that highly value social interdependence, cultural tightness provides the social regulation and predictability that increases experienced happiness.

TABLE S1: Scores of cultural tightness at the provincial level in China

<i>Province</i>	<i>Sample Size</i>	<i>Average Age (min, max) [years]</i>	<i>Average Length of Residence [years]</i>	<i>Percentage Male</i>	<i>Cultural Tightness Score (SD)</i>
GUANGDONG	409	31.37(19,69)	19.66	50	5.00(.57)
SHANGHAI	442	33.99(18,66)	26.53	37	4.87(.50)
BEIJING	429	34.12(18,67)	23.74	38	4.48(.57)
ZHEJIANG	400	32.10(18,68)	24.01	45	4.36(.58)
SHANDONG	432	34.15(18,69)	23.99	55	4.25(.58)
JIANGSU	429	33.62(18,69)	24.24	52	4.18(.56)
LIAONING	394	33.22(18,63)	24.16	54	3.99(.69)
HEBEI	417	34.11(18,69)	23.34	48	3.60(.61)
JILIN	331	30.85(18,65)	21.33	51	3.50(.69)
FUJIAN	379	30.94(18,65)	21.72	53	3.44(.65)
GUANGXI	370	29.83(18,62)	20.50	50	3.33(.67)
HUBEI	365	31.26(18,66)	21.58	50	3.24(.64)
TIBET	247	32.94(18,68)	20.91	56	3.20(.84)
SICHUAN	360	30.92(18,69)	20.61	48	3.11(.54)
HENAN	379	31.34(18,63)	22.70	58	3.04(.67)
HEILONGJIANG	378	33.00(18,66)	26.20	55	2.81(.71)
XINJIANG	369	31.43(18,60)	20.08	53	2.77(.75)
TIANJIN	369	33.06(18,67)	26.02	47	2.70(.67)
SHAANXI	364	31.41(18,69)	21.20	55	2.62(.65)
JIANGXI	367	30.19(18,68)	21.89	51	2.61(.64)
ANHUI	366	31.16(18,62)	22.94	59	2.54(.62)
INNER MONGOLIA	388	32.00(18,60)	22.43	52	2.23(.76)
CHONGQING	359	28.31(18,67)	21.90	50	2.21(.66)
QINGHAI	385	31.76(18,61)	21.17	49	2.06(.82)
HUNAN	349	30.52(18,65)	20.24	57	2.01(.63)
GANSU	396	32.91(18,67)	24.88	61	2.01(.76)
SHANXI	370	30.63(18,68)	22.26	54	1.95(.70)
YUNNAN	357	30.57(18,65)	20.74	64	1.85(.72)
HAINAN	343	31.05(18,65)	20.19	57	1.84(.79)
NINGXIA	373	31.25(18,65)	21.57	52	1.83(.79)
GUIZHOU	346	28.02(18,54)	19.97	57	0.85(.76)
Total	11,662	31.75(18,69)	22.44	52	3.00(.68)

Note. Tightness scores reported are after transformation. Sample includes those of both natives (born and raised in the province) and individuals from other provinces but have lived in the given province for more than 3 years. Their cultural tightness perceptions at the provincial level is not significantly different from those of natives (*mean difference*=0.01, *standard error*=0.01, *t*(11660)=0.88, *P*=0.38)

TABLE S2: Variable names and rounds collected

Round-1 (2014)	Round-2 (2017)	Round-3 (2017)
Tightness perceptions	Tightness perceptions	Tightness perceptions
Happiness (life satisfaction) (positive and negative affect)	Happiness (life satisfaction)	Openness to experience
Perception of governmental control	Perception of governmental control	Conscientiousness
Perception of LGBT Tolerance	Perception of LGBT Tolerance	Extraversion
Perception of Religious Practice	Perception of Religious Practice	Neuroticism
	Group collectivism	Agreeableness
	Relational Collectivism	Self-monitoring
	Uncertainty avoidance	Adaptor-innovator thinking styles
	Power distance	
	Traditionality	
	Behavior × situation constraints	

TABLE S3: Tightness-looseness divergent validity: Correlations with other cultural value variables at the individual level

Cultural value	Mean r_{wg}	ICC(1)	ICC(2)	Correlations with cultural tightness (<i>P-value</i>)	95%CI	<i>Effect size η^2</i>	Correlations with cultural tightness in U.S.* (<i>P Value</i>)	Correlations with global cultural tightness [†] (<i>P value</i>)
Group								
Collectivism	.45	.02	.64	.21(.00)	.18, .25	.04	.23(.11)	.43(.03)
Relational								
Collectivism	.48	.03	.78	.05(.003)	.02, .09	.003		.49(.01)
Power								
Distance	.07	.01	.59	-.23(.00)	-.27, -.20	.05		.32(.11)
Uncertainty								
Avoidance	.46	.01	.56	.23(.00)	.19, .26	.05		.47(.02)
Traditionality	.57	.01	.55	.22(.00)	.19, .26	.05		-.11(.54)

Notes: Analyses were conducted at the individual level using Round 2 data, N=3,304.

*Correlations with cultural tightness in U.S. were taken from Harrington and Gelfand (2014).

†Correlations with global cultural tightness were taken from Gelfand et al., (2011).

TABLE S4: Tightness-looseness convergent validity: Correlations with tolerance towards behaviors in different situations at the individual level

Situations	Correlations with Cultural Tightness (<i>p value</i>)	95%CI
Movie theatre	-.12(.0000)	-0.15, -0.08
Shopping mall	-.10(.0000)	-0.13, -0.06
Classroom	-.10(.0000)	-0.14, -0.07
Elevator	-.08(.0000)	-0.12, -0.05
Bus	-.08(.0000)	-0.12, -0.05
Hospital	-.07(.0000)	-0.10, -0.04
Park	-.07(.0001)	-0.11, -0.04
Public transportation (e.g. airplane, train)	-.07(.0002)	-0.10, -0.03
Public restaurants	-.06(.0002)	-0.10, -0.03
On the street	-.04(.04)	-0.07, -0.003

Notes: We developed behavioral constraints measures for the Chinese context. Specifically, we first identified 10 everyday situations where their level of situational strength is likely to vary in China (classroom, hospitals, elevators, on buses, on airplanes or trains, movie theatres, on the street, restaurants, shopping malls, parks). We then asked participants to what extent they think each of the following 7 behaviors (eat, play music out aloud, litter, publicly display affection, swear, allow pets and kids to defecate, smoke) is appropriate in each of the situations. Behavioral constraints data were collected in Round 2; full sample includes both local born and non-local born long-term residents (lived in the province for more than 3 years), N=3,304.

TABLE S5: Correlations between tightness-looseness and ecological and socio economic factors at the provincial level

China provincial-level indicators	Sources	Partial Correlations (P Value)*	95%CI	Effect size η^2	Bivariate Correlations (P Value)	95%CI	Effect size η^2	U.S. State-level indicators	Bivariate correlations (P Value)	Global level indicators	Partial correlations (P Value)†
<u>Population Variables</u>											
Population Density, 2015 (log)	National Bureau of Statistics of the People’s Republic of China, 2016	.35(.06)	-.01, .63	.12	.47(.01)	.19, .71	.21	Population density (log), 2010	-.05 (.73)		.31 (.10)
Rural Population Density, 2015(log)	National Bureau of Statistics of the People’s Republic of China, 2016	.38(.04)	.01, .65	.14	.35(.05)	.09, .59	.12			Rural Population density (log)	.59 (.01)
Ratio of urban to rural population, 2015	National Bureau of Statistics of the People’s Republic of China, 2016	-.07(.71)	-.42 .30	.00	.52(.00)	.18, .72	.27	Ratio of urban to rural population, 2000	-.51 (.00)		
Historical population density (log), Year 1749, N=18	Historical Population Data and the Relevant Studies China’s	-.02(.96)	-.49, .47	.00	.49(.04)	.03, .78	.25				
Minority Population Percentage, 2013	Ethnic Statistical Yearbook, 2014	-.09(.65)	-.43, .28	.01	-.31(.09)	-.60, .05	.10				
<u>Natural Resources and Environmental Vulnerability</u>											

China provincial-level indicators	Sources	Partial Correlations (P Value)*	95%CI	Effect size η^2	Bivariate Correlations (P Value) 95%CI Effect size η^2			U.S. State-level indicators	Bivariate correlations (P Value)	Global level indicators	Partial correlations (P Value)[†]
Water Pollution (Tons Per capita), 2015	China Environmental Statistics, 2016	.63(.00)	.20, .74	.40	.75(.00)	.54, .87	.56	Green condition index	-.77 (.00)	Access to safe water	-.50(.01)
SO2 in Air (Tons per KM2), 2015	China Environmental Statistics, 2016	.24(.19)	-.13, .56	.06	.45(.01)	.12, .70	.20			Air quality	-.44(.02)
PM 2.5 in Air, 2015 ($\mu\text{g}/\text{m}^3$) (N=29)	CCAC Clean Air Management Report, 2016	.21(.29)	-.18, .53	.04	.36(.05)	-.00, .64	.13				
Number of environmental emergencies, 2014 (times)	China Environmental Statistics, 2016	.17(.38)	-.21, .50	.03	.40(.03)	.05, .66	.16	Death rate due to cold, 1979-2004	-.06 (.69)		
								Death rate due to lightning, 1979-2004	.54 (.00)		
								Death rate due to storms and floods, 1979-2004	.76 (.00)		
								Death rate due to earth movements, 1979-2004	-.24 (.09)		

China provincial-level indicators	Sources	Partial Correlations (P Value)*	95%CI	Effect size η^2	Bivariate Correlations (P Value)	95%CI	Effect size η^2	U.S. State-level indicators	Bivariate correlations (P Value)	Global level indicators	Partial correlations (P Value)[†]
								Tornado Risk, 1950-1995	.64 (.00)		
Output of grains per capita, 1995-2015 (Kg/log)	National Bureau of Statistics of the People's Republic of China, 1994-2016	.04(.85)	-.33, .39	.00	-.31(.09)	-.60, .06	.10	Rate of food insecurity, 2008-2010	.43(.00)	Food Deprivation	.52(.01)
								Rate of very low food security, 2008-2010	.32(<.05)	Food supply	-.36(.05)
								Percentage of food insecure households, 2007	.53(.00)	Food production index	-.40(.03)
<u>Geographical Factors and Territorial Threats</u>											
<i>Distance from Beijing</i>											
Furthest	Baidu Map, 2017	.02(.91)	-.34, .38	.00	-.32(.08)	-.61, .04	.10				
Closest	Baidu Map, 2017	-.05(.80)	-.40, .32	.02	-.25(.17)	-.56, .11	.06				
Mean of (furthest and closest distance)	Baidu Map, 2017	-.01(.95)	-.32, .40	.01	-.30(.10)	-.59, .06	.10				
Capital city	Baidu Map, 2017	-.01(.96)	-.37, .35	.00	-.23(.22)	-.54, .14	.05				

China provincial-level indicators	Sources	Partial Correlations (P Value)*	95%CI	Effect size η^2	Bivariate Correlations (P Value)	95%CI	Effect size η^2	U.S. State-level indicators	Bivariate correlations (P Value)	Global level indicators	Partial correlations (P Value)[†]
Coastal province (dummy coded: 1 if province is next to the sea, 0 otherwise)	Coded by researchers	.40(.03)	.04, .66	.16	.60(.00)	.30, .78	.36				
Border province (0: not border, 1: border)	Coded by researchers Retrieved from Tiexue	.24(.20)	-.13, .55	.06	.37(.04)	.02, .64	.14				
Percentage area occupied by Japan during World War II	Military Web Tiexue.net: http://bbs.tiexue.net/post_4453127_1.html	.39(.04)	.02, .66	.15	.59(.00)	.29, .78	.35				
										Total number of territorial threats	.41(.04)
								Proxies for external threats			
								Percentage of slave-owning families, 1860	.78 (.00)		
								“The United States spends too much money on national	-.33 (.00)		

China provincial-level indicators	Sources	Partial Correlations (P Value)*	95%CI	Effect size η^2	Bivariate Correlations (P Value)	95%CI	Effect size η^2	U.S. State-level indicators	Bivariate correlations (P Value)	Global level indicators	Partial correlations (P Value)†
								defense” (avg.)			
								Rate of military recruitment, 2008	.40 (.00)		
Health								Influenza and pneumonia death rate, 2008	.52(.00)		
Population visited communicable disease clinics per capita, 2015	National Bureau of Statistics of the People’s Republic of China, 2016	.63(.00)	.34, .80	.40	.72(.00)	.49, .86	.52	Rate of HIV diagnosis, 2009	.29(<.05)		
								Rate of chlamydia, 2009	.46(.00)		
								Parasite/Disease Stress Index, 1993-2007	.55(.00)		
Infant Mortality, 2010	China Sixth Population Census, 2010	-.38(.04)	-.65, -.02	.14	-.57(.00)	-.77, -.27	.33	Infant mortality rate, 2003-2005	.76(.00)	Infant mortality	.42(.02)
								Child mortality rate, 2007	.60(.00)		

China provincial-level indicators	Sources	Partial Correlations (P Value)*	95%CI	Effect size η^2	Bivariate Correlations (P Value)	95%CI	Effect size η^2	U.S. State-level indicators	Bivariate correlations (P Value)	Global level indicators	Partial correlations (P Value)[†]
Life Expectancy, 2015	National Bureau of Statistics of the People's Republic of China, 2016	.25(.19)	-.13, .56	.06	.61(.00)	.33, .79	.37	Life expectancy at birth, 2010	-.80(.00)		
Death rate, 2015	National Bureau of Statistics of the People's Republic of China, 2016	-.17(.37)	-.50, .20	.03	-.30(.10)	-.59, .06	.09	Death rate, 2008	.52(.00)		
<u>Social Economic Factors</u>											
GDP Per Capita provincial-level, 2015	National Bureau of Statistics of the People's Republic of China, 2016				.64(.00)	.36, .81	.41				
Poverty rate, 2015	National Bureau of Statistics of the People's Republic of China, 2016	-.50(.01)	-.73, -.14	.25	-.47(.01)	-.71, -.12	.22	Poverty rate, 2009	.67(.00)		
Government employees (city level or lower) per capita, 2015	National Bureau of Statistics of the People's Republic of China, 2016	.58(.00)	.27, .78	.34	.44(.01)	.11, .69	.19	Homeless rate, 2009 State and local law enforcement, full-time employees per capita, 2008	-.55(.00)		.29 (<.05)
	Provincial-level local Supreme	.62(.00)	.33, .80	.38	.59(.00)	.30, .78	.35				

China provincial-level indicators	Sources	Partial Correlations (P Value)*	95%CI	Effect size η^2	Bivariate Correlations (P Value)	95%CI	Effect size η^2	U.S. State-level indicators	Bivariate correlations (P Value)	Global level indicators	Partial correlations (P Value)[†]
laws and regulations (Number counts)	Court (http://www.chinacourt.org/law.shtml)										
Cases of corruption that violate “eight-point code” by the communist party (per capita), 2015-2017	Central Commission for Discipline Inspection http://www.ccdi.gov.cn/	-.38(.04)	-.65, -.02	.14	-.34(.06)	-.62, .01	.12				
Cases of corruption that harm interests of the general public (per capita), 2015-2017	Central Commission for Discipline Inspection http://www.ccdi.gov.cn/	-.27(.16)	-.57, .10	.07	-.32(.08)	-.61, .04	.10				
Perceived trustworthiness of people from a given province by Chinese people from other provinces	Zhang & Ke (2002) Trust in China: A cross-regional analysis. Economic Research Journal.	.42(.03)	.07, .68	.18	.68(.00)	.43, .83	.46	Violent crime rate, 2009	.04 (.77)		
Trust propensity towards strangers (N=28)	The Chinese General Social Survey, 2013-2014	.26(.19)	-.13, .58	.07	.40(.03)	.03, .67	.16	Property crime rate, 2009	.19 (.19)		

China provincial-level indicators	Sources	Partial Correlations (P Value)*	95%CI	Effect size η^2	Bivariate Correlations (P Value)	95%CI	Effect size η^2	U.S. State-level indicators	Bivariate correlations (P Value)	Global level indicators	Partial correlations (P Value)[†]
								Murder rate, 2009	.19 (.20)		
								Forcible rape rate, 2009	.01 (.96)		
								Robbery rate, 2009	-.03 (.85)		
								Aggravated assault rate, 2009	.07 (.65)		
Number of times President Xi visited the province (times) (2012-2017)	China Central News covering 19th National Congress of the Communist Party of China, 2017 www.newsctt.v.net	.09(.66)	-.28, .43	.01	.33(.07)	-.03, .61	.11				
Length of President Xi visit in each province (days) (2012-2017)	China Central News covering 19th National Congress of the Communist Party of China, 2017 www.newsctt.v.net	.38(.04)	.03, .65	.14	.32(.08)	-.04, .60	.10				

China provincial-level indicators	Sources	Partial Correlations (P Value)*	95%CI	Effect size η^2	Bivariate Correlations (P Value)	95%CI	Effect size η^2	U.S. State-level indicators	Bivariate correlations (P Value)	Global level indicators	Partial correlations (P Value)[†]
Publication rate of government-owned newspaper (number of copies per person per issue), 2013	China News and Publishing Statistical Materials Compilation, 2014	-.10(.62)	-.44, .27	.01	.37(.04)	.02, .64	.14	“The government should exercise more control over what is shown on TV” (avg.)	.70(.00)	Openness of media Unrestricted socio sexuality orientation	-.53(.01)
Divorce rate, 2015	National Bureau of Statistics of the People’s Republic of China, 2016	-.07(.70)	-.42, .30	.01	.03(.88)	-.42, .29	.00				-.44(.001)
Population with higher education (university) degree per million people, 2010	China Sixth Population Census, 2010	-.06(.77)	-.41, .31	.00	.42(.02)	.08, .67	.18				
<i>Family Planning</i>											
Fertility rate, 2010	China Sixth Population Census, 2010	-.37(.04)	-.64, -.01	.14	-.68(.00)	-.83, -.43	.46				

China provincial-level indicators	Sources	Partial Correlations (P Value)*	95%CI	Effect size η^2	Bivariate Correlations (P Value)	95%CI	Effect size η^2	U.S. State-level indicators	Bivariate correlations (P Value)	Global level indicators	Partial correlations (P Value)[†]
Contraception rate Year 2013	China Population Statistical Yearbook 2014	.39(.04)	.03, .66	.15	-.20 (.28)	-.52, .17	.04				
<i>Religious practices</i>											
Number of temples Per 1000 Km (Buddhism, Taoism)	Baidu Map, 2017	.17(.37)	-.20, .50	.03	.39(.03)	.05, .66	.15			Percentage attending religious service	.54 (.01)
Number of mosques and churches Per 1000 Km	Baidu Map, 2017	.23(.22)	-.14, .54	.05	.51(.00)	.19, .73	.26			Importance of god	.37 (.05)
<i>Gender equality</i>											
Gender ratio in higher level education (women to men), 2010	China Sixth Population Census, 2010	.12(.52)	-.25, .46	.01	.34(.06)	-.02, .62	.12				
Gender ratio of newborns (girls to boys), 2010	China Sixth Population Census, 2010	.36(.05)	-.00, .64	.13	.11(.55)	-.25, .45	.01				
Percentage of people indicating no	The Chinese General	.31(.11)	-.08, .62	.10	.34(.08)	-.04, .63	.12				

China provincial-level indicators	Sources	Partial Correlations (P Value)*	95%CI	Effect size η^2	Bivariate Correlations (P Value)	95%CI	Effect size η^2	U.S. State-level indicators	Bivariate correlations (P Value)	Global level indicators	Partial correlations (P Value)†
preference for children's gender (question a37c), 2013 (N=28)	Social Survey, 2013-2014										
Residential Mobility											
Percentage of residents that have Hukou from outside the province, 2010		.06(.74)	-.31,.42	.00	.11(.56)	-.26, .45	.01	Percentage of people born in state of residence (reversed)	-.44		

Notes:

* Partial correlations controlled for provincial level GDP per capita.

† Partial correlations controlled for GNP per capita (1).

TABLE S6: Correlations and summary statistics for patents, tightness, and economic indicators

	Mean	S.D.	1	2	3	4	5	6	7	8	9	10	11
1 Invention patents per scientist and engineer	.01	.01											
2 Utility model patents per scientist and engineer	.04	.03	.75										
3 Cultural Tightness	2.98	1.00	.14	.22									
4 Scientist and engineer per capita	.00	.00	.43	.17	.47								
5 Cumulative patents per scientist and engineer	-1.82	1.08	.58	.56	.11	.20							
6 Education spending per GDP	.04	.04	.08	-.03	-.21	-.02	-.03						
7 Enterprise R&D per total R&D	57.72	23.37	.16	.34	.02	-.15	.61	-.08					
8 University R&D per total R&D	18.78	28.46	-.12	-.17	.02	.12	.29	.01	-.07				
9 University S&T funding per GDP	.00	.00	.34	.06	.30	.80	.04	.16	-.35	.32			
10 National program funding per GDP	.00	.00	-.21	-.15	.10	-.10	-.14	.03	-.04	-.01	-.02		
11 FDI per GDP	.02	.04	.15	.22	.30	.25	.13	-.15	.00	-.23	.12	.03	
12 GDP per capita (RMB)	1340.00	1700.00	.80	.66	.30	.59	.59	-.07	.30	-.22	.31	-.25	.45

All magnitudes equal or above .08 are significant at $P < .05$.

TABLE S7: Predictive validity of tightness-looseness on entrepreneurship activities and adaptor-innovator thinking styles (Results of multilevel regression models)

Outcome variables	Full sample						Local sample					
	Cultural tightness		Age		Gender		Cultural tightness		Age		Gender	
	γ_{01} (P)	95%CI	β_{01} (P)	95%CI	β_{02} (P)	95%CI	γ_{01} (P)	95%CI	β_{01} (P)	95%CI	β_{02} (P)	95%CI
Adaptor-Innovator thinking styles												
Adaptor-Innovator (combined)	-.01(.04)	-.02, -.00	-.00(.00)	-.00, -.00	.03(.00)	.02, .05	-.02(.01)	-.03, -.01	-.00(.00)	-.00, -.00	.05(.00)	.02, .07
Originality (sub-dimension)	.01(.27)	-.01, .04	-.00(.84)	-.002, .00	.10(.00)	.07, .14	-.01(.54)	-.04, .02	.00(.28)	-.00, .00	.08(.01)	.02, .14
Efficiency (sub-dimension)	.04(.00)	.02, .06	.003(.86)	-.03, .03	.02(.35)	-.02, .05	.04(.03)	.00, .07	.01(.00)	.01, .01	-.02(.54)	-.07, .04
Conformity (sub-dimension)	.01(.23)	-.01, .03	.00(.01)	-.00, .00	.00(.86)	-.03, .03	.02(.19)	-.01, .05	.00(.02)	.00, .001	-.02(.34)	-.08, .03
Entrepreneurship Activity (0=no, 1=yes)*	-.05(.49)	-.17, .08	.02(.00)	.01, .02	.39(.00)	.24, .54	-.15(.12)	-.35, .04	.02(.00)	.01, .03	.47(.00)	.21, .73

Notes: All analyses used provincial-level cultural tightness score reported earlier in the paper. We controlled gender and age in all analyses. Adaptor-innovator thinking styles were collected in Round 3, N=3,495. For local only outcome variables, we used data from participants who reported they were born and raised in the province. N=1,403. *For entrepreneurship, full sample N=3,304, local only N=1,177.

TABLE S8. Predictive validity of tightness-looseness on perceptions of happiness (Results of multilevel regression models with control variables)

Predictors	Full Sample										Local Only									
	Cultural Tightness		GDP Per capita		Age		Gender		Education		Cultural Tightness		GDP Per capita		Age		Gender		Education	
Outcome variables	γ_{01} (P)	95% CI	γ_{02} (P)	95% CI	b_{01} (P)	95% CI	b_{02} (P)	95% CI	b_{03} (P)	95% CI	γ_{01} (P)	95% CI	γ_{02} (P)	95% CI	b_{01} (P)	95% CI	b_{02} (P)	95% CI	b_{03} (P)	95% CI
Life satisfaction	.25 (.00)	.18, .33	-.00 (.79)	-.00, .00	.03 (.00)	.03, .03	-.18 (.00)	-.26, -.10	.25 (.00)	.21, .30	.22 (.00)	.12, .33	-.00 (.79)	-.00, .00	.03 (.00)	.03, .04	-.14 (.03)	-.27, -.02	.22 (.00)	.15, .29
Positive Affect (yesterday)	.01 (.03)	.00, .02	.00 (.59)	-.00, .00	-.00 (.19)	-.00, .00	-.02 (.01)	-.04, -.01	.01 (.14)	-.00, .02	.01 (.13)	-.00, .03	.00 (.46)	-.00, .00	-.00 (.13)	-.00, .00	-.02 (.15)	-.05, .01	-.00 (.99)	-.02, .02
Negative Affect (yesterday)	-.05 (.00)	-.06, -.04	.00 (.78)	-.00, .00	-.00 (.00)	-.01, -.11	.02 (.03)	.00, .04	-.01 (.03)	-.02, -.00	-.03 (.00)	-.06, -.01	-.00 (.14)	-.00, .00	-.00 (.00)	-.01, -.00	.01 (.69)	-.01, .03	-.01 (.10)	-.03, .00
											Cultural Tightness γ_{01} (P)	95% CI	Individual income b_{01} (P)	95% CI	Age b_{02} (P)	95% CI	Gender b_{03} (P)	95% CI	Education b_{04} (P)	95% CI
Life satisfaction- General Social Survey China*											.03 (.05)	.00, .05	.00 (.48)	-.00, .00	.01 (.00)	.01, .01	-.08 (.00)	-.12, -.04	.02 (.00)	.01, .02

Life satisfaction data was collected in both Round 1 and Round 2, (full sample: N=8,167; local respondents only: N=3,074). Positive affect and negative affect data was collected in Round 1 (Full sample: N=4,863, local respondents only: N=1,897).

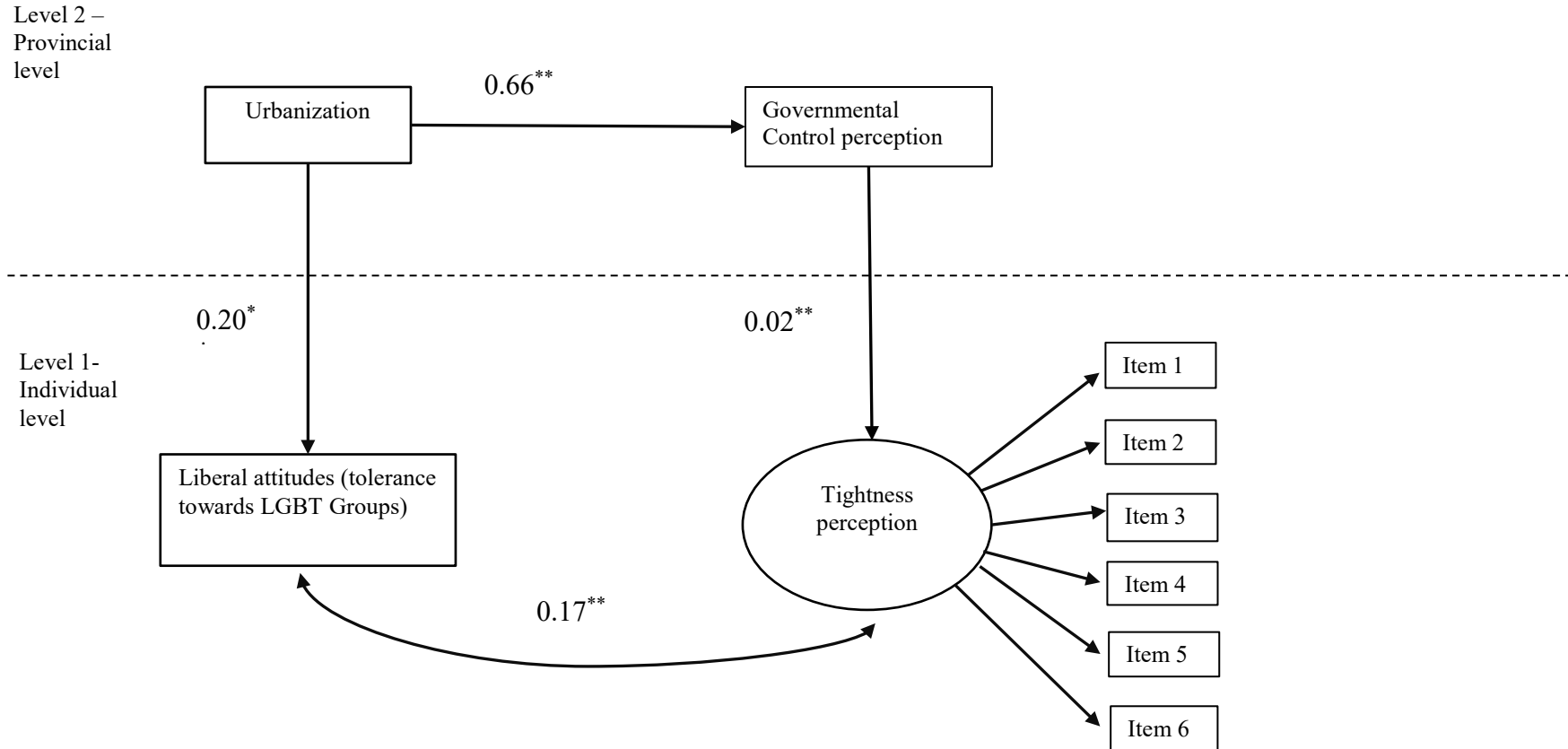
*Life satisfaction- General Social Survey data measure was taken from the General Social Survey-China (2013), (N=6,795). Total number of province is 28 (missing data from Tibet, Xinjiang, and Hainan).

TABLE S9. Instrumental variable analyses

	2SLS Regression Results			
	First stage DV: Cultural tightness	Second stage DV: Life satisfaction	First stage DV: Cultural tightness	Second stage DV: Life satisfaction
<u>Predictor</u>				
Cultural tightness		.13*		.33**
<u>Instrumental variables</u>				
Lawyers per capita	2.22**			
Percentage Area occupied by Japan during World War II			1.38**	
<u>Control variables</u>				
Age	.01*	.03**	.01*	.03**
Gender	-.08**	-.19**	-.11**	-.16**
Education	.14**	.28**	.09*	.24**
Constant	1.86**	3.47**	1.82**	3.08**

Life satisfaction data was collected in both Round 1 and Round 2, (full sample: N=8,167; local respondents only: N=3,074). +p<.10, *p<.05, **p<.01.

Figure S1. Multilevel model for the relationships among urbanization, governmental control perception, liberal attitudes, and tightness perception



Note. Double-headed arrows indicate correlations. Straight lines indicate direct relationships. Numbers are unstandardized path coefficients. Urbanization at the provincial level is operationalized as urban population density. Liberal attitudes is operationalized using tolerance towards LGBT groups. Governmental control at the provincial level is a composite measure of standardized values of aggregated perception of governmental intervention in daily life, number of times president Xi Jinping visited the province in the last five years, and government-owned newspaper publications per capita (we have conducted CFA on these measures and found they all loaded in one factor, CFI=1.00, RMSEA = .00, $\alpha=.73$). We did not include gender inequality under liberal attitude at the individual level as we only have gender inequality data at the provincial level. ** $p < .01$, * $p < .05$.

Dataset S1: Primary data on cultural tightness

This dataset includes variables and items surveyed in all three rounds of data collection from 2014 to 2017. Time periods that variables collected are listed in Table S2.

Variable Labels	Items
ProvinceNumber	Name of provinces
Tightness1-6	6 items for Tightness perceptions
LGBTTolerance	Perceived tolerance towards LGBT groups
ReligiousActivity	Perceived prevalence of religious activities
GovernmentIntervention	Perceived governmental intervention in daily life
Gender	Gender
Age	Age (year)
Living_Year	Length of residence (years)
Education	Education
Round	Data collection (dummy) round 1-2-3
Entreprene	Whether you have participated in entrepreneurship activities
born	Whether the person is born and raised in the province
ext1- ext2r	2 items for extraversion
agg1r- agg2	2 items for agreeableness
con1- con2r	2 items for conscientiousness
es1r - es2	2 items for emotional stability
ope1- ope2r	2 items for openness to experience
adapinn1- adapinn32	32 items Adaptor – Innovator thinking style
selfmonit1r-selfmonit18	18 items Self-monitoring
tradi1- tradi5	5 items Traditionality
Laughter - Happiness	3 items Positive affect (Laughter, Joy, Happiness)
Worrisome -Anger	3 items Negative affect (Worrisome, Sadness, Anger)
Beh1_situa1 -beh7_situa10	70 items of Behavioral×Situation constraints
Life Satisfaction	Life satisfaction (Ladder)
collec1r- collec4r	4 items Group collectivism
relation_coll1r-relation_coll4r	4 items Relational collectivism
pd1r-pd5r	5 items Power distance
Ua1r-ua4r	4 items Uncertainty avoidance

Survey Items (English and Chinese Version)

Variables Rounds (Time) collected	Measurements (Sources)	Chinese version
<p>Cultural tightness Round-1 (2014), Round-2 (2017), Round-3(2017)</p>	<p>(Gelfand, M. J., Raver, J. L., Nishii, L., Leslie, L. M., Lun, J., Lim, B. C., ... & Yamaguchi, S. (2011). Differences between tight and loose cultures: A 33-nation study. <i>science</i>, 332(6033), 1100-1104.)</p> <p>The following statements refer to [PROVINCE NAME] as a whole. Please indicate whether you agree or disagree with the following statements. Note that the statements sometimes refer to "social norms," which are standards for behavior that are generally unwritten.</p> <ol style="list-style-type: none"> 1. There are many social norms that people are supposed to abide by in this country. 2. In this country, there are very clear expectations for how people should act in most situations. 3. People agree upon what behaviors are appropriate versus inappropriate in most situations this country. 4. People in this country have a great deal of freedom in deciding how they want to behave in most situations. (Reverse coded) 5. In this country, if someone acts in an inappropriate way, others will strongly disapprove. 6. People in this country almost always comply with social norms. 	<p>以下是一些对 XX 省 / 市整体的描述。请根据您所了解的真实情况对以下描述做出评价： 请注意，“社会规范”在下列说法中是指一些没有被明文规定的社会行为标准</p> <ol style="list-style-type: none"> 1. 在本省 / 市，有很多社会规范需要遵守 2. 在本省 / 市，大多数情况下人们很清楚应该如何作为 3. 在本省 / 市，大多数情况下大家对什么是妥当或者不妥当的行为有很大程度的共识 4. 在本省 / 市，大多数情况下人们可以充分地自由决定作为 5. 在本省 / 市，如果有人做出不妥的违规行为会受到来自其他人的强烈的反对 6. 在本省 / 市，人们总是会遵守社会规范
<p>Perception of LGBT tolerance Round-1 (2014), Round-2 (2017)</p>	<p>People have high tolerance towards LGBTQ group members (people who identity as Lesbian, Gay, Bisexual, Transgender, and Queer)</p>	<p>在本省 / 市，人们对于同性恋，跨性别者有较高的包容</p>

Perception of Religious Practice Round-1 (2014), Round-2 (2017)	Religious practice is prevalent in everyday life.	在本省 / 市，人们在日常生活中会经常性地涉及宗教活动																																	
Perception of governmental control Round-1 (2014), Round-2 (2017)	Governmental intervention has a major influence in everyday life.	在本省 / 市，政府干预对于人们日常生活有重大的影响																																	
Happiness Round-1 (2014), Round-2 (2017)	(Helliwell, J. F., Layard, R., & Sachs, J. (Eds.). (2013). <i>World happiness report 2013</i> . Sustainable Development Solutions Network) Here is a picture of a ladder. Suppose we say that the top of the ladder represents the best possible life for you and the bottom represents the worst possible life for you. Where on the ladder do you feel you personally stand at the present time? [Image of ladder] <div style="display: flex; justify-content: space-between; align-items: center;"> <table border="1" style="border-collapse: collapse; text-align: center; width: 50px;"> <tr><td>10</td></tr><tr><td>9</td></tr><tr><td>8</td></tr><tr><td>7</td></tr><tr><td>6</td></tr><tr><td>5</td></tr><tr><td>4</td></tr><tr><td>3</td></tr><tr><td>2</td></tr><tr><td>1</td></tr><tr><td>0</td></tr> </table> <table border="1" style="border-collapse: collapse; text-align: center; width: 50px;"> <tr><td>10</td></tr><tr><td>9</td></tr><tr><td>8</td></tr><tr><td>7</td></tr><tr><td>6</td></tr><tr><td>5</td></tr><tr><td>4</td></tr><tr><td>3</td></tr><tr><td>2</td></tr><tr><td>1</td></tr><tr><td>0</td></tr> </table> </div>	10	9	8	7	6	5	4	3	2	1	0	10	9	8	7	6	5	4	3	2	1	0	这里有一幅梯子的示意图，梯子的顶端代表你可能过上的最好生活，底端代表你可能过上的最差生活。你目前处于梯子的什么位置上？ <div style="display: flex; justify-content: center; align-items: center; margin-top: 20px;"> <table border="1" style="border-collapse: collapse; text-align: center; width: 50px;"> <tr><td>10</td></tr><tr><td>9</td></tr><tr><td>8</td></tr><tr><td>7</td></tr><tr><td>6</td></tr><tr><td>5</td></tr><tr><td>4</td></tr><tr><td>3</td></tr><tr><td>2</td></tr><tr><td>1</td></tr><tr><td>0</td></tr> </table> </div>	10	9	8	7	6	5	4	3	2	1	0
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Positive and Negative affect Round-1 (2014), Round-2 (2017)	(Helliwell, J. F., Layard, R., & Sachs, J. (Eds.). (2013). <i>World happiness report 2013</i> . Sustainable Development Solutions Network) (Yes or No answer) 1) Did you smile or laugh a lot yesterday? 2) Did you experience the following feelings during a lot of the day yesterday? a. enjoyment? b. happiness? c. worry? d. sadness? e. anger?	是 / 非题目： 请问您昨天有微笑或者开怀大笑么？ 请问您昨天有很大程度地经历过以下情绪么？ a.愉快 b.高兴 c.忧虑 d.悲伤 e.愤怒																																	

Variables Rounds (Time) collected	Measurements (Sources)	Chinese version
Collectivism (Group collectivism) Round-2 (2017)	<p>(House, R. J., Hanges, P. J., Javidan, M., Dorfman, P. W., & Gupta, V. (Eds.). (2004). <i>Culture, leadership, and organizations: The GLOBE study of 62 societies</i>. Sage publications.)</p> <p>Group collectivism:</p> <ol style="list-style-type: none"> 1. In this society, leaders encourage group loyalty even if individual goals suffer (reverse coded) 1- strongly agree 7-strongly disagree 2. The economic system in this society is designed to maximize: <ol style="list-style-type: none"> 1- Individual interests 7- Collective interests 3. In this society, being accepted by the other members of a group is very important. <ol style="list-style-type: none"> 1- Strongly agree 7- Strongly disagree 4. In this society: <ol style="list-style-type: none"> 1- group cohesion is valued more than individualism 4- group cohesion and individualism are equally valued 7- individualism is valued more than group cohesion 	<ol style="list-style-type: none"> 1. 在本省市，领导者鼓励即使个人目标受损也要对团队忠诚 2. 在本省市，经济体系的设置为了将 1-个人利益的最大化 7-集体利益的最大化 3. 在本省市，被某一群体的其他成员接受十分重要 4. 在本省市，1-团队凝聚力比个人主义更受重视 4-团队凝聚力和个人主义同样受重视 7-个人主义比团队凝聚力更受重视
Collectivism (Relational Collectivism) Round-2 (2017)	<p>(House, R. J., Hanges, P. J., Javidan, M., Dorfman, P. W., & Gupta, V. (Eds.). (2004). <i>Culture, leadership, and organizations: The GLOBE study of 62 societies</i>. Sage publications.)</p> <p>Relational collectivism:</p> <ol style="list-style-type: none"> 1. In this society, children take pride in the individual accomplishments of their parents (reverse coded) 1- 	<ol style="list-style-type: none"> 1. 儿童会因为自己父母的个人成就而感到自豪 2. 父母会因为自己孩子的个人成就而感到自豪 3. 年老的父母通常和他们孩子们一起居住 4. 孩子通常和父母居住一起直到他们结婚

	<p>strongly agree 7-strongly disagree</p> <ol style="list-style-type: none"> 2. In this society, parents take pride in the individual accomplishments of their children (reverse coded) 1-strongly agree, 7- strongly disagree 3. In this society, aging parents generally live at home with their children. (reverse coded) 1-strongly agree, 7- strongly disagree 4. In this society, children generally live at home with their parents until they get married (reverse coded) 1-strongly agree, 7- strongly disagree 	
<p>Power Distance Orientation Round-2 (2017)</p>	<p>(House, R. J., Hanges, P. J., Javidan, M., Dorfman, P. W., & Gupta, V. (Eds.). (2004). <i>Culture, leadership, and organizations: The GLOBE study of 62 societies</i>. Sage publications.)</p> <ol style="list-style-type: none"> 1. In this society, followers are expected to (reverse coded) 1-obey their leaders without question; 7- question their leaders when in disagreement 2. In this society, power is (reversed code) 1-concerned at the top; 7- shared throughout the society 3. In this society, people in positions of power try to: (reverse coded) 1- increase their social distance from less powerful individuals 7- decrease their social distance from less powerful people 4. In this society, rank and position in the hierarchy have special privileges. (reverse coded) 1-strongly agree 7-strongly disagree 	<ol style="list-style-type: none"> 1. 下属应当 1-毫无疑问地服从领导 7- 如果有不同意见可以质疑领导 2. 权力是 1-集中在上层的 7-在全社会共享的 3. 处在权位高层的人尽量 1-拉开他（她）与权位底层的人的社会距离 7- 缩短他（她）与权位底层的人的社会距离 4. 在等级中的排序和权位标志着（相应的）优越待遇和特权 5. 一个人的影响力主要取决于 1-他（她）的能力和对社会的贡献 7-他（她）的社会地位赋予的权限

	5. In this society, a person's influence is based primarily on 1- one's ability and contribution to the society 7- the authority of one's position	
Uncertainty Avoidance Round-2 (2017)	<p>(House, R. J., Hanges, P. J., Javidan, M., Dorfman, P. W., & Gupta, V. (Eds.). (2004). <i>Culture, leadership, and organizations: The GLOBE study of 62 societies</i>. Sage publications.)</p> <p>1. In this society, orderliness and consistency are stressed, even at the expense of experimentation and innovation (reverse coded) 1- strongly agree, 7- strongly disagree</p> <p>2. In this society, societal requirements and instructions are spelled out in detail so citizens know what they are expected to do (reverse coded) 1- Strongly agree, 7- strongly disagree</p> <p>3. In this society, most people lead highly structured lives with few unexpected events. 1- Strongly agree 7-Strongly disagree</p> <p>4. This society has rules or laws to cover: 1-almost all situations 4- some situations 7- very few situations</p>	<p>1. 在本省/市，即使牺牲实验和创新也要保证社会的秩序和一致</p> <p>2. 社会规范和条例都会一一具体地列出来以保证公民遵守 3. 大多数人的生活都十分结构化 不会出现意料之外的情况</p> <p>4. 本省/市，在 1-大多数情境都有对应的明文规定行为规范 7-极少数情境下才有对应的明文规定行为规范</p>
Traditionality Round-2 (2017)	<p>(Farh, J. L., Earley, P. C., & Lin, S. C. (1997). Impetus for action: A cultural analysis of justice and organizational citizenship behavior in Chinese society. <i>Administrative science quarterly</i>, 421-444.)</p> <p>1. The chief government official is like the head of a household. The citizen should obey his decisions on all state matters</p>	<p>1. 政府官员就像是“一家之主”。公民应当遵守官员所有关于行政事务的决定</p> <p>2. 避免错误的最佳方式是听从有经验的前辈的指导</p> <p>3. 女性婚前应听从服从父亲;婚后应听从服从丈夫</p> <p>4. 如果有意见相左，争论双方应当询问有经验的前辈来决定哪一方对</p>

	<ol style="list-style-type: none"> 2. The best way to avoid mistakes is to follow the instructions of senior persons 3. Before marriage, a women should subordinate herself to her father. After marriage, a women should subordinate herself to her husband. 4. When people are in dispute, they should ask the most senior person to decide who is right 5. Those who are respected by parents should be respected by their children 	<p>5. 孩子应当尊敬他们父母尊敬的人</p>
<p>Behavioral x Situation Constraint</p> <p>Round-2 (2017)</p>	<p>(Gelfand, M. J., Raver, J. L., Nishii, L., Leslie, L. M., Lun, J., et al. 2011. Differences Between Tight and Loose Cultures: A 33-Nation Study. <i>Science</i>, 332(6033): 1100–1104.)</p> <p>Your task in each case is simply to rate, on a scale from 1 through 6, the appropriateness of the particular behavior in the situation that is given. The rating scale is as follows: 1 = extremely inappropriate, 2 = very inappropriate, 3 = somewhat inappropriate, 4 = somewhat appropriate, 5 = very appropriate, and 6 = extremely appropriate</p> <p>Behaviors: Eat, Flirt, Smoke, Allow children or pets urinate, littering, play music (without headphones), swear</p> <p>Situations: Classroom, restaurant, movie theatre, city sidewalk, elevator, bus, airplane or train, public park, mall, hospital</p>	<p>请问您认为在您所在的省（市）下列行为在这些场合中发生是否合适</p> <p>行为：吃东西，抽烟，打情骂俏，骂脏话，公放音乐，允许儿童和宠物随地大小便，随地丢垃圾</p> <p>场合：饭店，医院，公园，商场，火车或者飞机上，大街上，教室，电影院，电梯里，公交车上</p>

Variables Rounds (Time) collected	Measurements (Sources)	Chinese version
Personality (Big 5) Round-3 (2017)	<p>(Gosling, S. D., Rentfrow, P. J., & Swann, W. B. (2003). A very brief measure of the Big-Five personality domains. <i>Journal of Research in personality</i>, 37(6), 504-528.)</p> <p>Here are a number of personality traits that may or may not apply to you. Please write a number next to each statement to indicate the extent to which you agree or disagree with that statement. You should rate the extent to which the pair of traits applies to you, even if one characteristic applies more strongly than the other.</p> <p>I see myself as:</p> <ol style="list-style-type: none"> 1. _____ Extraverted, enthusiastic. 2. _____ Critical, quarrelsome. 3. _____ Dependable, self-disciplined. 4. _____ Anxious, easily upset. 5. _____ Open to new experiences, complex. 6. _____ Reserved, quiet. 7. _____ Sympathetic, warm. 8. _____ Disorganized, careless. 9. _____ Calm, emotionally stable. 10. _____ Conventional, uncreative 	<p>这里有一些性格特征，可能适用也可能不适用于您。请选择您在多大程度上同意或不同意这一说法。即使一个特性比另一个更强烈地适用于您，也请您在一定程度上对这两个特征进行评价。</p> <p>性格外向, 热情。 批判, 爱争吵。 可靠, 自律。 焦虑, 容易烦躁。 接受新体验, 复杂的思维。 矜持, 安静。 同情, 热情。 无序\粗心。 冷静, 情绪稳定。 常规, 缺乏创造性。</p>
Self-monitoring Round-3 (2017)	<p>(Gangestad, S., & Snyder, M. (1985). " To carve nature at its joints": On the existence of discrete classes in personality. <i>Psychological Review</i>, 92(3), 317.)</p> <p>The statement below concern your personal reactions to a number of situations. No two</p>	<p>以下我们列出了一些对您的描述。没有两个陈述完全相同，因此在回答之前请仔细考虑每个描述。如果是符合对您的描述或大部分符合，则选择“是”，如果为不符合或</p>

	<p>statements are exactly alike, so consider each statement carefully before answering. If a statement is TRUE or MOSTLY TRUE as applied to you, then choose “T”, if a statement is FALSE or NOT USUALLY TRUE as applied to you choose “F”.</p> <ol style="list-style-type: none"> 1. I find it hard to imitate the behavior of other people. 2. At parties and social gatherings, I do not attempt to do or say things that others will like. 3. I can only argue for ideas which I already believe. 4. I can make impromptu speeches even on topics about which I have almost no information. 5. I guess I put on a show to impress or entertain people. 6. I would probably make a good actor. 7. In groups of people, I am rarely the center of attention. 8. In different situations and with different people, I often act like very different persons. 9. I am not particularly good at making other people like me. 10. I'm not always the person I appear to be. 11. I would not change my opinions (or the way I do things) in order to please someone else or win their favor. 12. I have considered being an entertainer. 13. I have never been good at games like charades or improvisational acting. 14. I have trouble changing my behavior to suit different 	<p>大部分不符合，则选择“否”。</p> <ol style="list-style-type: none"> 1. 我发现模仿别人的行为是很难的。 2. 在宴会和其他社交聚会中，我并不试图按照别人的喜好说话做事。 3. 只能为自己已经相信的观点而辩护。 4. 我能够对几乎一无所知的问题作即席讲话。 5. 我想我会做出一些样子来以给人留下深刻印象或让人高兴。 6. 我或许能够成为好演员。 7. 在一群人中我很少成为注意的中心。 8. 在不同场合，面对不同的人，我常常有不同的行为表现，就像变了一个人一样 9. 我不是特别善于让别人喜欢我。 10. 我并不总是我所表现出来的那种人。 11. 我不会为了取悦他人而改变观点或行为方式。 12. 我曾考虑过当一名演员。 13. 我从来不擅长玩即兴表演这类游艺活动。 14. 我难以改变自己的行为去适合不同的人 and 不同的场合。 15. 在晚会上，说笑话讲故事一般都是别人的事。 16. 与别人在一起我有点不知所措，不能自然地表现自己。
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	<p>people and different situations.</p> <p>15. At a party, I let others keep the jokes and stories going.</p> <p>16. I feel a bit awkward in company and do not show up quite as well as I should.</p> <p>17. I can look anyone in the eye and tell a lie with a straight face (if for a right end).</p> <p>18. I may deceive people by being friendly when I really dislike them.</p>	<p>17. 我能够面不改色地说假话（如果目的正当）。</p> <p>18. 对于实际上不喜欢的人，我可能装的很友好。</p>
<p>Adaptor- Innovator Thinking Style Round-3 (2017)</p>	<p>(Kirton, M. (1976). Adaptors and innovators: A description and measure. <i>Journal of applied psychology</i>, 61(5), 622.)</p> <p>Imagine that you had been asked to present, consistently and for a long time, a certain image of yourself to others. Please indicate the degree of difficulty that such a task would entail</p> <ol style="list-style-type: none"> 1. Has original ideas 2. Proliferates ideas 3. Is stimulating 4. Copes with several new ideas at the same time 5. Will always think of something when stuck 6. Would sooner create than improve 7. Has fresh perspectives on old problems 8. Often risks doing things differently 9. Likes to vary set routines at a moment's notice 10. Prefers to work on one problem at a time 11. Can stand out in disagreement against group 12. Needs the stimulation of frequent change 	<p>想象一下，你被要求长期以来一直向别人展示自己的某种形象。请说明这项任务所带来的困难程度</p> <ol style="list-style-type: none"> 1. 许多很有创意的点子 2. 很快想出很多新点子 3. 做事时能保持积极振奋的态度 4. 能同时应对许多新的观点 5. 当我陷入困境时，我总能想出办法解决 6. 宁愿创新而不是在原有的基础上改进 7. 对于老生常谈的问题，能以崭新的视角看待 8. 经常冒险尝试不同的行事方式 9. 喜欢随时改变惯例和常规 10. 偏好一次解决一个问题 11. 当与一群人意见不一致时能坚持到底 12. 需要经常的变化来鼓励 13. 喜欢渐进式的变化 14. 做事很周到、细致

	<p>13. Prefers changes to occur gradually</p> <p>14. Is thorough</p> <p>15. Masters all details painstakingly</p> <p>16. Is methodical and systematic</p> <p>17. Enjoys detailed work</p> <p>18. Is (not) a steady plodder</p> <p>19. Is consistent</p> <p>20. Imposes strict order on matters within own control</p> <p>21. Fits readily into “the system”</p> <p>22. Conforms</p> <p>23. Readily agrees with the team at work</p> <p>24. Never seeks to bend or break the rules</p> <p>25. Never acts without proper authority</p> <p>26. Is prudent when dealing with authority</p> <p>27. Likes the protection of precise instructions</p> <p>28. Is predictable</p> <p>29. Prefers colleagues who never “rock the boat”</p> <p>30. Like bosses and work patterns which are consistent</p> <p>31. Works without deviation in a prescribed way</p> <p>32. Holds back ideas until obviously needed</p>	<p>15. 很细心，彻底地掌握所有的细节</p> <p>16. 很有方法、系统</p> <p>17. 喜欢做细节繁琐的工作</p> <p>18. 是一个稳定的辛勤工作的人</p> <p>19. 做事太对前后一致</p> <p>20. 会井然有序地处理自己所能掌控的事</p> <p>21. 很快适应所处的环境与制度</p> <p>22. 顺应、遵从他人意见</p> <p>23. 在团队合作时，很容易同意大多数人的看法</p> <p>24. 从不会主动改变或者违反规则</p> <p>25. 从不在得到来自权威方面的指令前行事</p> <p>26. 在权威面前，会非常小心谨慎</p> <p>27. 做事时喜欢保障明确的指示</p> <p>28. 能够预测的</p> <p>29. 喜欢和做事稳健的同事合作</p> <p>30. 喜欢工作模式比较不千变万化的老板和同事</p> <p>31. 做事遵守规定、不会违背常规</p> <p>32. 只有在绝对必要的时候，说出自己的点子</p>
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