Title

Moving Chairs in Starbucks: Observational Studies Find Rice-Wheat Cultural Differences in Daily Life in China

Short title: Rice-Wheat Differences in Daily Life

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Abstract

Traditional paddy rice farmers had to share labor and coordinate irrigation in a way that most wheat farmers did not. We observed people in everyday life to test whether these agricultural legacies gave rice-farming southern China a more interdependent culture and wheat-farming northern China a more independent culture. In Study 1, we counted 8,964 people sitting in cafes in six cities and found that people in northern China were more likely to be sitting alone. In Study 2, we moved chairs together in Starbucks across the country so that they were partially blocking the aisle (N = 678). People in northern China were more likely to move the chair out of the way, which is consistent with findings that people in individualistic cultures are more likely to try to control the environment. People in southern China were more likely to adjust the self to the environment by squeezing through the chairs. Even in China’s most modern cities, rice-wheat differences live on in everyday life.

One-Sentence Summary

More people in wheat-growing northern China were sitting alone and moved a chair blocking the aisle in cafes than people in the rice-farming south.

MAIN TEXT
In a laboratory study, we tested over 1,000 people from all over China on several psychological measures of culture (1). People who had grown up in southern China showed behaviors typical of interdependent cultures like Japan—holistic thought, low importance of the self, a strong distinction between friends and strangers. People from northern China showed behaviors that are more common in individualistic cultures such as the UK—analytic thought, strong importance of the self, and a smaller distinction between friends and strangers.

Another difference between northern and southern China is that, for thousands of years, people in northern China grew wheat and millet, while people in Southern China farmed paddy rice (Guanzi, 7th Century BC). The idea that how cultures historically made a living affects our behavior is called subsistence theory (2–4). For example, herding is a relatively individual activity, where people move from place to place, and many relationships are transitory. In contrast, many farming cultures are sedentary, with more stable, enmeshed ties between people.

The rice theory of culture breaks down farming further (1, 5). Compared to dryland crops like wheat and millet, rice paddy farming often requires irrigation systems that multiple families have to coordinate. Traditional paddy rice also required about twice as many man hours as crops like wheat, which led many rice cultures to form customs of exchanging labor (6–8). Over time, this tight coordination may have pushed rice cultures to develop a more interdependent culture.

**Study Overview**

In this study, we test for rice-wheat cultural differences in everyday life in China. In Study 1, we count how many people are sitting alone versus with other people in Starbucks and other cafes around China. In Study 2, we moved chairs to block aisles in Starbucks and observed how many people move the self to squeeze through or move the chairs. We designed this measure to test exerting control over the environment, which is more common in individualistic cultures (9).

These studies make several contributions to previous studies:

1. These studies test the rice theory outside of the lab, using a sample that is not primarily students. In some ways, middle class patrons of Starbucks in major cities might be the last people we should expect to find subsistence style differences among.

2. These studies address the fundamental problem of self-report measures in cultural psychology. Researchers have documented many problems with using self-report scales to measure differences across cultures, from the reference-group effect (10) to the stubbornly persistent finding that the US is just as collectivistic as China and Korea (11, 12; or that Japan is actually less collectivistic than the US: 13, p. 18). There is also the complete lack of correlation between nation-level self-reports of conscientiousness with objective behaviors that tap into that same trait (14). Yet observational studies of cultural differences are oddly rare in psychology (except for a few strong examples: 14, 15). Developing measures of concrete behaviors addresses the
problems of self-report and may provide future researchers with documented non-self-report measures to use.

3. Much of cross-cultural psychology has focused on East-West differences and differences between nations. This study tests for differences within China.

4. This study extends the sample to include Hong Kong, which has not been tested as a part of rice-wheat differences.

**Strengths and Weaknesses of Observational Studies**

Yet observational studies have weaknesses too. Laboratory studies are strong designs because they use a controlled environment and previously validated measures. Observational studies are not so tightly controlled. We also cannot be as sure we know what we are measuring—that the behavior we are measuring represents individualism as we expect it does. For example, if a driver does not stop completely at a stop sign, is that a sign of self-importance? Impatience? Disregard for law? The meaning of particular behaviors is more open to debate than it is with laboratory measures.

To combat these weaknesses, we use one behavior (sitting alone) that psychologists have used before to document differences between groups of people. For the new measure we create (chair moving), we validate the measure by collecting data in the US, China, and Japan. We also validate the reliability of the observations by having multiple observers rate the same behaviors. This gives some evidence that these behaviors truly differ between individualistic and interdependent cultures.

Despite the difficulties of observational studies, they are a good antidote for the fact that many lab tests are not very helpful for describing what rice and wheat cultures are like in everyday life. In a thought style task, if people in northern China are more likely to pair “train” with “bus” rather than “train” with “tracks,” what does that mean for everyday life? These observational studies give a more concrete picture of how rice and wheat cultures differ in everyday life.

**Testing Sites**

We tested in six cities: Beijing (wheat), Shenyang (wheat), Shanghai (rice), Nanjing (rice), Guangzhou (rice), and Hong Kong (rice). All of the cities are in solidly rice areas (> 70% farmland devoted to rice) or wheat areas (< 20% farmland devoted to rice; 16). We chose major cities because (a) it would be easier to get large samples in each site and (b) they have chain store locations that we could use as semi-uniform testing environments.

Figure 1 shows how the six cities compare on demographic variables. All are major metropolises, with GDP per capita much higher than the national average. That may actually make these places harder places to test the rice theory (if modernization strongly influences culture and pushes cultures further away from their agrarian roots). The fact that most people in major cities do not farm for a living means we are testing for the legacy of a history of farming, rather than the effect of having farmed land oneself.

**Why Hong Kong is an Interesting Test Case**
We included Hong Kong for two reasons. (a) Hong Kong is a much wealthier, more modernized city than the other cities. Hong Kong has a GDP per capita about three times Beijing and Shanghai (Figure 1), as well as a longer history of market capitalism and globalization. (b) Hong Kong is a former British colony, which has given it direct influence from a Western culture.

Using Hong Kong as a test case sets up a strong contrast between two competing theories: modernization and the rice theory. If Hong Kong shows more individualism, it would suggest modernization (or British influence) has made the culture more individualistic. If Hong Kong shows more interdependence, it would suggest rice differences can persist in the face of modernization.

**Are People in Beijing Cafes Actually from Beijing?**

One weakness of sampling large cities in China is that large cities have attracted newcomers from rural areas. So how do we know that people in Beijing cafes are actually from Beijing?

The answer is that people in Beijing cafes don’t actually need to be from Beijing. Instead, this sample can adequately test the rice theory as long as most people in Beijing Starbucks are from the north—other wheat-growing provinces. Second, even among southerners who have moved to Beijing, there should be at least some cultural assimilation as they live in the north over years and years. Thus, the real threat to validity would be if more than 50% of people in Beijing cafes are recent arrivals from the south, which is unlikely.

But to be conservative, we surveyed 105 people in Starbucks in Beijing and Shanghai. We asked patrons which province they grew up in and how long they had lived in Beijing or Shanghai. In Shanghai Starbucks, 61% grew up in Shanghai, 89% were from rice provinces, and 93% were from rice provinces or had lived in Shanghai for at least 2 years (Figure 1). In Beijing, 60% grew up in Beijing, 92% were from wheat provinces, and 98% were from wheat provinces or had lived in Beijing at least 2 years. Thus, people in Starbucks overwhelmingly represent the rice and wheat regions.

**Aren’t Cafes Pretty Removed from Farming?**

Cafes are expensive. In Beijing, full-time minimum wage is US$434 a month (17). At that rate, 10 Starbucks lattes a month would cost about 10% of someone’s income. Starbucks customers are probably wealthier than average.

Yet that should make it harder to find evidence for the rice theory. If modernization erases differences based on historical rice farming, then it should be harder to find those differences among middle class consumers in modern cafes. Yet cultures have inertia, and differences rooted in subsistence styles can persist hundreds of years after people put down their plows (18). This study tests whether China’s rice-wheat differences persist among its urban middle class.

**Natural Laboratories**

Cafes do have one strong advantage as testing site. Cafes are naturally uniform environment across different cities. One benefit of global capitalism is that it produces
stores with more or less the same environment—the same colors, the same chairs, the same smells—across China. That means environmental cues should be roughly similar across cities.

**Study 1**

**Sitting Alone**

In Study 1, we observed the number of people sitting with other people or alone in cafes. Why measure sitting alone? On the face of it, sitting alone seems consistent with the independent culture of wheat areas. There is also evidence that doing things alone is more common in individualistic cultures. For example, researchers created an index of individualistic markers across the United States such as divorce rates and Libertarian voting rates (19). This index was positively correlated with the percentage of people driving to work alone versus carpooling and the percentage of people living alone (p. 284). That suggests that spending time alone is more common in individualistic cultures.

**Observation Rules**

Three researchers observed 8,964 people in 256 stores across six cities (Beijing, Shenyang, Shanghai, Nanjing, Guangzhou, and Hong Kong). Observers coded the number of people sitting alone, the number of groups, the number of people in groups, and the gender of the people sitting alone. To test whether the observations were reliable, observers coded samples in Beijing ($N = 447$) and Shanghai ($N = 251$). Codings were nearly identical ($r > 0.99$).

We hypothesized that day of the week and time of day might affect the percentage of people sitting alone, so we noted these variables and made an effort to sample evenly by time and day of the week across cities. The observers avoided tourist areas such as the Forbidden City and the Bund, as well as areas with lots of travelers, such as train stations and airports. To avoid seasonal variation, all coding took place in the summer between June and August. Observers did not sample during national holidays or exceptional events (such as a typhoon that hit Guangzhou).

**Control Variables**

As a predictor variable, we used the percentage of farmland devoted to rice paddies in the province, although results were similar using a binary rice-versus-wheat variable. We used the earliest rice data we could find, from the 1996 Statistical Yearbook. In addition to time of day and day of the week, we tested for city-level and district-level GDP per capita, population density, and age of the population from 2013.

**Results**

People in rice regions were less likely to be alone $\gamma = -0.42, P = 0.010, r_{\text{city-level}} = 0.79$ ($\gamma$ represents group-level regression coefficients). On weekdays, roughly 10% more people were alone in the wheat region than the rice region. On weekends, the wheat region had about 5% more people sitting alone (Figure 2).

**Day of the Week**
People were most likely to be alone on Mondays (32% on Mondays versus 22% on weekends). The percentage alone went down each day of the week through Sunday $B = -0.08, P < 0.001, r_{\text{ind-level}} = 0.10$ (Table S12). (A linear day-of-the-week variable explained slightly more variance than a weekday-versus-weekend variable.)

**Morning versus Afternoon**

People were most likely to be alone early in the day and then less likely to be alone in the afternoon and into evening $B = -0.07, P < 0.001, r_{\text{ind-level}} = 0.10$ (time of day rounded to the nearest hour). However, rice-wheat differences persisted throughout the day (Figure 3). Around noon, 33% of people were alone. By 5pm, 22% of people were alone. Controlling for time of day and day of the week, people in the rice areas were less likely to be alone $\gamma = -0.43, P = 0.003, r_{\text{city-level}} = 0.85$ (Table 1). We controlled for time of day and day of the week in all of the following analyses.

**Starbucks Versus Other Cafes**

People were more likely to be alone in Starbucks than other cafes $\gamma = 0.17, P = 0.053, r_{\text{store-level}} = 0.05$ (Table S1). Results were similar when we grouped together Starbucks and Costa Coffee to represent large international chains $\gamma = 0.21, P = 0.028, r_{\text{store-level}} = 0.08$. Rice-wheat differences remained after controlling for international chains $\gamma = -0.45, P = 0.007, r_{\text{city-level}} = 0.80$ (Table 1).

**Modernization**

If modernization makes cultures more individualistic, more Western, we would expect more people in modernized districts to be sitting alone. However, people in wealthier cities were not more likely to be alone (GDP per capita, $\gamma = 0.006, P = 0.672, r_{\text{city-level}} = 0.15$; Table S3). This could be because the rice areas are also wealthier. After controlling for rice, people in wealthier cities were more likely to be alone $\gamma = 0.018, P < 0.001, r_{\text{city-level}} = 0.47$ (rice remained significant $\gamma = -0.56, P < 0.001$; Table 1).

Results were similar using wealth at the district level. Wealthier districts were not more likely to have people sitting alone $\gamma = .002, P = 0.824, r_{\text{district-level}} = 0.08$ (Table S4). But controlling for rice, people were marginally more likely to be alone in wealthier districts $\gamma = 0.010, P = 0.082, r_{\text{district-level}} = 0.56$ (Table 1). In sum, the basic rice-wheat differences were stronger than modernization differences. Modernization differences were apparent only after taking rice-wheat differences into account.

**Self-Employed People**

Some people are alone in cafes because they are working. That may be particularly common for people who are self-employed and have no office space. We tested whether cities with a higher percentage of self-employed workers had more people sitting alone. Controlling for rice, areas with more self-employed people did not have more people sitting alone $\gamma = 1.75, P = 0.629, r_{\text{city-level}} = 0.27$ (Table S8).

**Population Density**

Researchers have argued two opposite ideas for how population density might affect culture. On the one hand, some researchers have argued that population density should make cultures more collectivistic (e.g., 20, 21 pp. 58-59). On the other hand,
cities are more densely populated than rural areas, and some researchers think cities are more individualistic (22). In terms of the practicalities of sitting alone, people in dense cities may have smaller homes and more need to use a café as a place to work or read.

Results supported the idea that dense cities are more collectivistic. People were less likely to be alone in districts with higher population density $\gamma = -0.03, P = 0.177, r_{\text{district-level}} = -0.22$. Yet population density is highly correlated with rice; after controlling for rice, population density was not significant $\gamma = 0.02, P = 0.559, r_{\text{district-level}} = 0.31$. In sum, population density was not a strong predictor.

**Age and Gender**

If China’s younger generation is more individualistic than the older generation, then districts with younger populations might have more people sitting alone. However, younger districts were no more likely to have people sitting alone (Table S4). Men made up 50.6% of the people sitting alone in the wheat region and 52.4% in the rice region. Thus, gender did not seem able to explain differences between regions.

**Alternative Predictors**

In the supplemental materials, we present analyses of other variables that researchers have used to explain cultural differences: climate (temperature), pathogen prevalence, percentage of non-local residents, and alternative measures of modernization (service sector employment, employment in private industry, and internet penetration). Although the sample is small to test many different theories, rice consistently predicted differences more strongly than these alternatives (Table S8).

**Discussion**

People in the wheat areas were more likely to be alone than people in rice areas. This was also true in Hong Kong, a wealthier, more modernized city in the rice region. These results suggest that rice-wheat cultural differences within China extend into everyday life—not just in the careful controlled lab measurements.

**Study 2**

**Chair Moving**

Some cultural psychologists have argued that, when people run into a problem, individualists are more likely to try to change the situation, and collectivists are more likely to change the self to fit the situation (21, 23 p. 67). Similarly, in their classic paper on self-concept, Markus and Kitayama (24) theorized that individualistic Americans value “gaining control over surroundings” (p. 241), whereas Japanese people tend to see maturity as the ability to gain control over the inner world of the self (p. 227).

Findings have supported these theories. For example, researchers have found that Americans emphasize control and influence, whereas people in Japan emphasize adjustment and fitting in (9, 25–27). In addition, research on “primary control” (active control) versus “secondary control” (adjusting to the situation) has found that Americans are more likely to try primary control (28).
To test this theory in everyday life, we pushed chairs together in Starbucks and observed how many people moved the chairs out of their way and how many moved their body to squeeze through the chairs (Figure 4). If people in rice areas are more collectivistic, with less importance placed on the self, they should be less likely to move the chairs.

To the best of our knowledge, no studies have used this method before. Thus, we cannot be certain what moving the chair represents. Thus, we tested the validity of this method by running samples in two countries shown to have differences in importance of the self—Japan and the US. We also tested a sub-sample of participants in China who did and did not move the chair on psychological constructs previously shown to differ between individualistic and collectivistic cultures: cultural thought style, internal versus external locus of control, and self-efficacy (see SOM for more details).

Finally, moving the chair is similar to a study that put participants in front of a fan that was set to an uncomfortably high setting (29). Participants who were primed to feel powerful (and perhaps place more importance on the self) were more likely to turn the fan off or move it out of the way. Thus, there is some evidence that actively removing an obstacle is more common among people who place a higher importance on the self.

**Observation Rules**

A total of 678 people in five cities walked through the chair trap (wheat: Beijing and Shenyang; rice: Shanghai, Guangzhou, and Hong Kong). All observations were made in the summer (July 11 to September 2). We ran the study in Starbucks only in order to keep the testing environment similar across cities.

**Control Variables**

Observers coded for several variables we thought might affect how likely people are to move chairs: gender, time of day, day of the week, employee versus customer, walking alone versus in a group, and under/over 40 years old. Observers estimated whether people were under or over 40 years old based on their appearance. In addition to rice, we ran models with GDP per capita and population density at the city and district level.

**Results**

People in the rice region were less likely to move the chair $\gamma = -1.86$, $P < 0.001$, $r_{\text{city-level}} = -0.99$, $r_{\text{ind-level}} = -0.24$ (Table 2). In the rice region, about 6% of people moved the chair; in the wheat region, 16% of people moved the chair (Figure 5).

**Employees**

Employees were much more likely to move the chair $B = 1.93$, $P < 0.001$, $r_{\text{ind-level}} = 0.10$ (Figure 6). Among employees, 24% moved the chair compared to 4% of customers. Yet rice-wheat differences were apparent among employees, $\gamma = -2.55$, $P < 0.001$, $r_{\text{city-level}} = -0.86$, $r_{\text{ind-level}} = -0.39$, and civilians $\gamma = -1.67$, $P = 0.009$, $r_{\text{city-level}} = -0.97$, $r_{\text{ind-level}} = -0.19$. 
Gender

Among customers, women were less likely to move the chair $B = -1.06, P = 0.016, r_{\text{ind-level}} = -0.19$ (Figure 6). Among employees, men and women did not differ $B = 0.03, P = 0.936, r_{\text{ind-level}} < 0.01$. In a model controlling for gender and employee effects, the rice-wheat differences remained $\gamma = -2.02, P < 0.001, r_{\text{city-level}} = 0.97, r_{\text{ind-level}} = -0.24$ (Table 2).

Age and Time of Day

Many people have argued that the younger generation in China is more individualistic than the older generation (30). If so, older people might be less likely to move the chairs. On the other hand, older people may feel more respected in society or able to assert control. There were no significant differences in chair moving for people below 40 years old $B = 0.03, P = 0.928, r_{\text{ind-level}} < 0.01$.

At the district level, districts with older populations were less likely to move the chair $\gamma = -0.18, P = 0.041, r_{\text{dist-level}} = -0.49$ (among non-employees; Table S6). But this relationship became non-significant after adding rice $\gamma = -0.05, P = 0.667, r_{\text{dist-level}} = -0.19$. Time of day was not related to chair moving ($P = 0.851$).

Alone versus Groups

People in groups were marginally less likely to move the chair $B = -0.66, P = 0.069, r_{\text{ind-level}} = 0.11$. However, this might be because (1) employees never walked in groups and (2) people in rice areas were more likely to be walking in groups. In a model including rice, employee, and gender, the effect of walking in a group was not significant ($P = 0.565$).

Modernization

We tested whether people in more developed (and presumably more modernized) cities were more likely to move the chair. Wealth of the city was not related to chair moving $\gamma = -0.35, P = 0.467, r_{\text{city-level}} = -0.44$ (GDP per capita; Table S6). This was also true after controlling for rice ($P = 0.936; Table 2$).

Next we zoomed into the district level. People in wealthier districts were not more likely to move the chair GDP per capita $\gamma = -0.02, P = 0.517, r_{\text{city-level}} = 0.23$ (Table S6). The slight negative relationship could be because the rice areas of China are wealthier than the wheat areas. Controlling for rice, people in wealthier districts were marginally more likely to move the chairs $\gamma = 0.03, P = 0.199, r_{\text{city-level}} = 0.67$.

People in more densely populated districts were less likely to move the chairs $\gamma = -0.19, P = 0.052, r_{\text{dist-level}} = -0.61$ (Table S6). But again, rice areas tend to be more densely populated than wheat areas; controlling for rice, population density was not significant $\gamma = 0.01, P = 0.937, r_{\text{dist-level}} < 0.01$. In sum, wealth and urbanization were not strong predictors of moving the chair.

Alternative Predictors

The supplemental materials present tests of temperature, pathogen prevalence, percentage of non-local residents, and alternative measures of modernization. These alternative variables were not strong predictors of chair moving, particularly after taking rice farming into account (Table S9).
Validity Checks

Because previous studies have not used chair moving as a psychological variable, we tested validity several ways. We approached a sub-sample \((N = 42)\) of café-goers who did or did not move the chair and asked them to complete several psychological measures. Chair movers thought more analytically (more common in individualistic cultures) than people who did not move the chair \(B = 0.61, P = 0.024, r = 0.35\). Chair movers also scored marginally higher on internal locus of control \(B = 0.60, P = 0.088, r = 0.27\). There were no differences on self-efficacy \(B = 0.05, P = 0.845, r = 0.03\).

Next, we tested validity by testing in cultures known from prior research to differ in individualism: the US and Japan. If moving the chairs actually taps into feelings of control over the environment that are more common in individualistic cultures, Americans should be more likely than people in China and Japan to move the chair. To test this, we observed 93 people walk through the chair trap in Washington DC and New York City. Americans were more than twice as likely to move the chair \((8.0\% \text{ in China versus } 20.4\% \text{ in the US}; \text{Figure 6}, B = 1.70, P < 0.001, r = 0.22, \text{Table 9})\).

We also ran a small sample in Japan (Kyoto and Nagoya, 45 observations). As a rice culture and a collectivistic culture, Japan should have a low rate of moving the chair. Japan’s rate of chair moving \((8.5\%)\) was similar to China’s \((8.0\%)\), \(\gamma = -0.15, P = 0.788, r = 0.02\). The results from the US and Japan suggest that chair moving maps onto differences across between individualistic and collectivistic cultures.

We also analyzed whether chair moving was more likely among particular demographic groups. Previous studies have found that men score higher on power \((31, 32, \text{p. 953})\). There is also some evidence that men score higher on individualism \((33; \text{in China: } 1, \text{SOM}; \text{but see } 12, \text{p. 243})\). The fact that men were more likely to move the chair is consistent with the idea that this measure is tapping into a similar underlying concept.

Perhaps the most obvious validity check is to compare employee and civilians. Employees are in charge of the store and should feel like they have the authority to move chairs. The finding that employees were five times more likely to move the chair supports the notion that chair moving taps into control over the environment.

Finally, we compared rates of chair moving to a measure of the importance of the self from a previous study of regional differences in China \((I)\). That study used the sociogram task, in which participants draw circles to represent the self and friends. Researchers then measured the size of the circles to see whether people draw the self bigger than they draw friends. Areas that scored higher on self-inflation were more likely to move the chair \(\gamma = 2.21, P < 0.001, r_{\text{city-level}} = 0.99, r_{\text{ind-level}} = 0.23\). This suggests chair moving has convergent validity with other measures used to measure cultural differences.

Discussion
Two studies found evidence that historical subsistence styles can explain meaningful regional differences in people’s everyday behavior in China. Modernization differences did not account for the differences—if anything, the wealthier cities (the rice areas) were less individualistic. The fact that these differences appeared among mostly middle-class city people suggests that rice-wheat differences are still alive and well in modern China.

**Replication and Limitations**

This study also serves as a conceptual replication of the laboratory study using entirely different outcome measures (34). Observational studies have inherent limitations. We cannot always know whether sitting alone or moving a chair taps into individualism. And we cannot guarantee that minor differences in the environment across cities affected the results.

Yet when viewed with the prior laboratory study as a whole, the results here suggest that the rice and wheat regions of China are different and that these differences are not artifacts of particular lab tests. Measuring concrete behaviors is important because cultural psychologists have found that nations’ self-reports on questionnaires do not always match their behavior (14). Concrete behavioral measures like these provide an alternative to using self-report questionnaires to measure cultural differences—a method that researchers have frequently criticized (10-12).

**Rice Farming and Modernization**

This study extended the rice theory by including Hong Kong. Hong Kong is particularly interesting because it has a history of British influence and it is far wealthier than the Mainland cities. Yet few people in Hong Kong moved the chair or sat alone. This data suggests that modernization does not inevitably cause people to behave like Westerners—much as modern, wealthy nations like Singapore and Japan still score much lower on individualism than Western countries (35). The results here suggest that these differences extend from self-report surveys into whether people are sitting alone in Starbucks.

**Methods: Sitting Alone**

In an effort to standardize the observations, observers followed several rules. Only seated patrons counted; people standing in line did not count unless they later joined someone sitting. People who were clearly foreigners were not counted. Although this is not always easy to determine, observers used appearance and the language people were using (if they were talking). Each location could only be observed once per day to avoid counting the same people twice. People sitting outside were only counted if they had purchased something; this excludes people who were using outdoor chairs as a place to sit without buying anything.

Observers plotted routes based on the locations of Starbucks and visited any nearby cafes. We defined cafes as places that serve coffee or tea and where most patrons are drinking beverages and eating light snacks. If many patrons were drinking alcohol or eating meals, the store was not counted.
In most cases, it was easy to determine who was alone and who was together with other people. However, particularly in cafes that are crowded or have shared tables, people sit near each other, and it is not always clear whether they are together. In these cases, observers lingered to look for signs that people were together, such as talking to each other.

**Statistical Power**

At the convention for a small effect size (Cohen’s $d = 0.2$), the sitting alone sample had over 99% statistical power. Thus, instead of aiming for a specific sample size, we sampled to try to ensure time of day and day of the week were similar across sites.

**Reliability**

To test how reliable the observations were, three observers independently coded 447 people in 12 cafes in Beijing at the same time. Across coders, the percentage of people alone per café correlated almost identically $r_s \geq 0.99$. Two coders also tested for reliability in the rice region by independently coding 251 people in 10 stores in Shanghai. The percentage sitting alone per café was nearly identical $r > 0.99$. These results suggest that coders agree on who is alone and who is with other people in the vast majority of cases.

**Methods: Chair Moving**

**Checking Sample Comparability**

Rice and wheat sites did not differ in the age, gender, or employee status of participants ($P_s > 0.73$). Controlling for time of day and day of the week, people in the rice areas were more likely to be walking in groups (14% versus 30%, $P < 0.001$). This datapoint supports the finding from Study 1 that people in the wheat area are more likely to be alone.

**Observation Rules**

Two observers followed several rules to standardize the observations. In setting up the chair trap, the observers tried to be stealthy so that the other patrons would not know we were testing their behavior. Observers used only lightweight wooden chairs, never heavy plush chairs or high metal stools. These heavier chairs would be much harder for people to move. In each case, the observer moved the chairs to the width of his hips to ensure that the chairs were always the same distance apart. In case body size differences between observers might affect the results, we ran analyses controlling for the observer.

If a person moved the chairs, observers repositioned the chairs to the standard distance and did not count anyone who walked through the moved chairs while they were farther apart than the standard distance. Sometimes other patrons would sit down in one of the empty chairs. When this happened, observers stopped coding until they could find alternate chairs or until the person left.

If someone walked through the chair trap more than once, observers only coded the first time. Observers only set traps in places that did not require the chairs to be moved too far from their original position. All traps were set indoors.
Statistical Power

At the convention for a small effect size (Cohen’s $d = 0.2$), the chair moving sample had 96% statistical power. We sampled to ensure both coders visited rice and wheat cities and sampled for at least two days in each city.

Reliability

Two observers first trained together in two Starbucks to make sure their procedures were the same. Next, the two observers independently coded the same people at two Starbucks to test whether their observations were reliable. The two coders agreed on all cases of whether the chairs were moved or not. All control variables were identical except for one observation where one observer recorded two people, and the other coder thought the second observation was the same person who had crossed previously. The supplemental materials include analyses with observer as a predictor variable and find it is not related to chair moving ($P = 0.854$). Thus, the results suggest that codings were reliable across observers.

Validity Checks: Psychological Measures

As a validity check, we ran the chair trap in Beijing and approached 42 café-goers who did or did not move the chair. They then completed paper-and-pencil tasks measuring cultural thought style, internal versus external locus of control, self-efficacy, and demographics.

To measure cultural thought style, the triad categorization task has participants categorize objects that can be paired based on abstract category (e.g., train and bus) or relation/use (train and tracks). Prior research has found that people in the East Asia and rice areas of China choose more relational pairings than people from the West and wheat areas of China ($I, 37$).

Participants also completed a five-item version of the locus of control scale ($38$). Participants choose from competing statements that endorse the idea that outcomes in their life are determined by their own control or by external forces. Researchers have found that people in the US and Western Europe score higher on internal locus of control than people in China and Hong Kong ($39$). Participants also completed a five-item scale measuring self-efficacy ($40$), which has been found to be higher in the United States than in Japan and Hong Kong ($41$).

Statistical Analysis

We used binomial (alone or not/moved chair or not) hierarchical linear models using the GLMER function in the program R. We present results for models nesting people in cities, districts, or stores depending on the predictor variable. Fully nested models with stores nested in districts nested in cities are in Tables S10-S11.
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Data availability: Original data are available via the Open Science Framework and upon request from the first author.

Figures and Tables
Figure 1. About 90% of the people in Starbucks were from the local rice or wheat cultural region. The Human Development Index is a United Nations index of health, education, and wealth for 2015. GDP per capita data is from 2013, converted to US dollars. Population density = 2013.
Figure 2. People in the wheat area were more likely to be sitting alone on weekdays (left) and weekends (right). Bars = 1 SEM.
Figure 3. People were more likely to be alone earlier in the day, although rice-wheat differences persisted across the day. Yellow = wheat region; green = rice region. Bars = 1 SEM.
Figure 4. A research assistant demonstrating how difficult it is to walk through the chair trap (left). To standardize chair width, researchers set the chairs to the width of their hips. Researchers only used light wooden chairs like these (right) to set the chair traps, never large stools or large plush chairs like those in the background of the picture.
Figure 5. People in wheat areas were about three times more likely to move the chair than people in the rice areas. Bars = 1 SEM.
Figure 6. Employees were about 5 times more likely than customers to move the chair (left). Among customers, men were more likely than women to move the chair (center). Comparing China, Japan, and the US, Americans were about twice as likely to move the chair (right). Bars = 1 SEM.
Table 1

Rice-Wheat Differences in Sitting Alone

|                          | B/γ | SE  | z    | P    |
|--------------------------|-----|-----|------|------|
| Percent Rice             | -0.42 | 0.16 | -2.57 | 0.010 |
| Time of Day              | -0.07 | 0.01 | -6.55 | < 0.001 |
| Day of the Week          | -0.07 | 0.01 | -6.46 | < 0.001 |
| Percent Rice             | -0.43 | 0.14 | -2.97 | 0.003 |
| Time of Day              | -0.07 | 0.01 | -6.77 | < 0.001 |
| Day of the Week          | -0.07 | 0.01 | -6.38 | < 0.001 |
| International Chain      | 0.17  | 0.06 | 3.05  | 0.002 |
| Percent Rice             | -0.45 | 0.17 | -2.70 | 0.007 |
| Time of Day              | -0.06 | 0.01 | -6.60 | < 0.001 |
| Day of the Week          | -0.07 | 0.01 | -6.62 | < 0.001 |
| City GDP per Capita      | 0.018 | 0.005 | 3.38 | 0.001 |
| Percent Rice             | -0.56 | 0.09 | -6.37 | < 0.001 |
| Time of Day              | -0.07 | 0.01 | -5.50 | < 0.001 |
| Day of the Week          | -0.07 | 0.01 | -5.82 | < 0.001 |
| City Population Density  | 0.02  | 0.03 | 0.59  | 0.559 |
| Percent Rice             | -0.51 | 0.22 | -2.33 | 0.020 |
| Time of Day              | -0.07 | 0.01 | -5.65 | < 0.001 |
| Day of the Week          | -0.07 | 0.01 | -5.87 | < 0.001 |
| District GDP per Capita  | 0.010 | 0.006 | 1.74 | 0.082 |
| Percent Rice             | -0.53 | 0.16 | -3.39 | 0.001 |

Note: Day of the week is coded numerically: Monday = 1 to Sunday = 7. Time of day is rounded to the nearest hour. Model is an HLM using the binomial GLMER function. Data is grouped at the city level in each model except the model with district GDP per capita. Table S10 presents models with districts nested within cities.
### Table 2

**Rice, GDP, and Demographic Predictors of Chair Moving**

| Predictor                           | B/γ   | SE    | z     | P     |
|-------------------------------------|-------|-------|-------|-------|
| Percent Rice                        | -1.86 | 0.44  | -4.19 | < 0.001 |
| Employee                            | 1.93  | 0.30  | 6.52  | < 0.001 |
| Below 40 Years Old                  | 0.03  | 0.38  | 0.09  | 0.928  |
| Female (civilians only)             | -1.06 | 0.44  | -2.41 | 0.016  |
| Employee                            | 2.03  | 0.31  | 6.57  | < 0.001 |
| Female                              | -0.46 | 0.30  | -1.51 | 0.131  |
| Percent Rice                        | -2.02 | 0.48  | -4.24 | < 0.001 |
| Employee                            | 2.03  | 0.35  | 5.80  | < 0.001 |
| Female                              | -4.53 | 0.31  | -1.47 | 0.141  |
| City GDP Per Capita (10k RMB)       | -0.02 | 0.17  | -0.13 | 0.895  |
| Percent Rice                        | -1.99 | 0.51  | -3.91 | < 0.001 |
| Employee                            | 2.07  | 0.32  | 6.53  | < 0.001 |
| Female                              | -0.46 | 0.32  | -1.46 | 0.145  |
| District GDP Per Capita (10k RMB)   | 0.02  | 0.02  | 0.94  | 0.347  |
| Percent Rice                        | -2.30 | 0.62  | -3.69 | < 0.001 |
| Employee                            | 2.10  | 0.32  | 6.65  | < 0.001 |
| Female                              | -0.41 | 0.32  | -1.27 | 0.205  |
| District Population Density         | -0.01 | 0.10  | -0.12 | 0.902  |
| Percent Rice                        | -1.96 | 0.74  | -2.64 | 0.008  |

Note: Models are HLMs using the binomial GLMER function. Data is grouped at the city level, except for the bottom two models, which are grouped at the district level. See Table S11 for models with districts nested in cities.
Figure S1. Sample chair trap in a Starbucks in Shanghai.
Table S1

Are People in International Chains More Likely to Be Sitting Alone?

|                          | B/γ | SE  | z     | P     |
|--------------------------|-----|-----|-------|-------|
| Time of Day              | -0.08 | 0.01 | -5.35 | < 0.001 |
| Day of the Week          | -0.06 | 0.01 | -4.52 | < 0.001 |
| Time of Day              | -0.08 | 0.01 | -5.44 | < 0.001 |
| Day of the Week          | -0.06 | 0.01 | -4.47 | < 0.001 |
| Starbucks                | 0.17  | 0.09 | 1.94  | 0.053 |
| Time of Day              | -0.08 | 0.01 | -5.47 | < 0.001 |
| Day of the Week          | -0.06 | 0.01 | -4.46 | < 0.001 |
| International Chain      | 0.21  | 0.09 | 2.19  | 0.028 |

Note: Day of the week is coded numerically: Monday = 1 to Sunday = 7. Time of day is rounded to the nearest hour. Model is an HLM using the binomial GLMER function. Data is grouped at the store level.
Table S2

*Rice-Wheat Differences Controlling for International Chain*

|                     | B/γ  | SE  | z     | P     |
|---------------------|------|-----|-------|-------|
| International Chain | 0.18 | 0.06| 3.13  | 0.002 |
| Time of Day         | -0.07| 0.01| -6.97 | < 0.001 |
| Day of the Week     | -0.07| 0.01| -6.25 | < 0.001 |
| International Chain | 0.17 | 0.06| 3.05  | 0.002 |
| Time of Day         | -0.07| 0.01| -6.77 | < 0.001 |
| Day of the Week     | -0.07| 0.01| -6.38 | < 0.001 |
| Percent Rice        | -0.45| 0.17| -2.70 | 0.007 |

Note: Day of the week is coded numerically: Monday = 1 to Sunday = 7. Time of day is rounded to the nearest hour. Model is an HLM using the binomial GLMER function. Data is grouped at the store level.
Table S3

_Sitting Alone and GDP_

|                                | B/γ  | SE  | z     | P     |
|--------------------------------|------|-----|-------|-------|
| **Day of the Week**            | -0.07| 0.01| -6.31 | < 0.001 |
| **Time of Day**                | -0.07| 0.01| -6.79 | < 0.001 |
| **Day of the Week**            | -0.07| 0.01| -6.28 | < 0.001 |
| **Time of Day**                | -0.07| 0.01| -6.81 | < 0.001 |
| **GDP per Capita**             | 0.006| 0.01| 0.42  | 0.672 |
| **Day of the Week**            | -0.07| 0.01| -6.62 | < 0.001 |
| **Time of Day**                | -0.06| 0.01| -6.60 | < 0.001 |
| **GDP per Capita**             | 0.018| 0.005| 3.38  | 0.001 |
| **Percent Rice**               | -0.56| 0.09| -6.37 | < 0.001 |

Note: Day of the week is coded numerically: Monday = 1 to Sunday = 7. Time of day is rounded to the nearest hour. Model is an HLM using the binomial GLMER function. Data is grouped at the city level. GDP is 2013 data.
### Table S4

*Sitting Alone and District-Level Data*

|                          | B/γ  | SE   | z    | P    | B/γ  | SE   | z    | P    |
|--------------------------|------|------|------|------|------|------|------|------|
| District GDP per Capita  | 0.002| 0.007| 0.22 | 0.824| 0.010| 0.006| 1.74 | 0.082|
| Day of the Week          | -0.06| 0.01 | -5.67| < 0.001| -0.07| 0.01 | -5.87| < 0.001|
| Time of Day              | -0.07| 0.01 | -5.55| < 0.001| -0.07| 0.01 | -5.65| < 0.001|
| Percent Rice             |      |      |      |      | -0.53| 0.16 | -3.39| 0.001|
| Population Density       | -0.03| 0.03 | -1.35| 0.177| 0.02 | 0.03 | 0.59 | 0.559|
| Day of the Week          | -0.07| 0.01 | -5.82| < 0.001| -0.07| 0.01 | -5.82| < 0.001|
| Time of Day              | -0.07| 0.01 | -5.40| < 0.001| -0.07| 0.01 | -5.50| < 0.001|
| Percent Rice             |      |      |      |      | -0.51| 0.22 | -2.33| 0.020|
| % Population ≥ 65        | -0.02| 0.02 | -0.88| 0.378| 0.01 | 0.02 | 0.45 | 0.651|
| Day of the Week          | -0.08| 0.02 | -4.97| < 0.001| -0.08| 0.02 | -5.07| < 0.001|
| Time of Day              | -0.08| 0.02 | -4.71| < 0.001| -0.08| 0.02 | -4.74| < 0.001|
| Percent Rice             |      |      |      |      | -0.63| 0.28 | -2.29| 0.022|

Note: Day of the week is coded numerically: Monday = 1 to Sunday = 7. Time of day is rounded to the nearest hour. Model is an HLM using the binomial GLMER function. Data is grouped at the district level. GDP and population density data is from 2013.
|                   | B/γ   | SE   | z     | P      |
|-------------------|-------|------|-------|--------|
| Percent Rice      | -1.86 | 0.44 | -4.19 | < 0.001|
| Employee          | 1.93  | 0.30 | 6.52  | < 0.001|
| Below 40 Years Old| 0.03  | 0.38 | 0.09  | 0.928  |
| Female (civilians only) | -1.06 | 0.44 | -2.41 | 0.016  |
| Percent Rice      | -2.06 | 0.47 | -4.34 | < 0.001|
| Employee          | 2.02  | 0.31 | 6.58  | < 0.001|
| Percent Rice      | -1.85 | 0.46 | -4.16 | < 0.001|
| Female            | -0.44 | 0.29 | -1.53 | 0.125  |
| Percent Rice      | -2.02 | 0.48 | -4.24 | < 0.001|
| Employee          | 2.03  | 0.31 | 6.57  | < 0.001|
| Female            | -0.46 | 0.30 | -1.51 | 0.131  |

Note: Models are HLMs using the binomial GLMER function. Data is grouped at the city level.
Table S6
City and District Census Predictors of Chair Moving

| Predictor                                | B/γ   | SE    | z     | P     |
|------------------------------------------|-------|-------|-------|-------|
| % Population 65 and Older               | -0.18 | 0.09  | -2.05 | 0.041 |
| Percent Rice                             | -2.02 | 1.30  | -1.55 | 0.121 |
| % Population 65 and Older               | -0.05 | 0.11  | -0.43 | 0.667 |
| City GDP Per Capita (10k RMB)            | -0.27 | 0.36  | -0.74 | 0.457 |
| City Log GDP Per Capita                  | -0.35 | 0.48  | -0.73 | 0.467 |
| Percent Rice                             | -1.84 | 0.48  | -3.81 | < 0.001 |
| City Log GDP Per Capita                  | -0.02 | 0.25  | -0.08 | 0.936 |
| District GDP Per Capita                  | -0.02 | 0.03  | -0.65 | 0.517 |
| Percent Rice                             | -2.44 | 0.70  | -3.51 | < 0.001 |
| District GDP Per Capita                  | 0.03  | 0.02  | 1.29  | 0.199 |
| District Population Density              | -0.19 | 0.10  | -1.95 | 0.052 |
| Percent Rice                             | -2.12 | 0.85  | -2.51 | 0.012 |
| District Population Density              | 0.01  | 0.11  | 0.08  | 0.937 |

Note: Models are HLMs using the binomial GLMER function. Data is grouped at the district or city level.
Table S7
*International Comparison of Chair Moving*

|                         | B    | SE  | z     | P       | B    | SE  | z     | P       |
|-------------------------|------|-----|-------|---------|------|-----|-------|---------|
| US (compared to China)  | 1.70 | 0.33| 5.18  | < 0.001 | 1.66 | 0.33| 5.04  | < 0.001 |
| Employee                | 1.93 | 0.30| 6.52  | < 0.001 | 1.94 | 0.30| 6.55  | < 0.001 |
| Female                  | -0.35| 0.26| -1.36 | 0.173   |      |     |       |         |
| Japan (compared to China)| -0.15| 0.57| -0.27 | 0.788   | -0.09| 0.57| -0.16 | 0.873   |
| Employee                | 2.04 | 0.29| 7.10  | < 0.001 | 2.07 | 0.29| 7.15  | < 0.001 |
| Female                  | -0.41| 0.29| -1.42 | 0.156   |      |     |       |         |

Note: Models use the binomial GLM function in the program R.
|                            | B/γ  | SE   | z    | P    | B/γ  | SE   | z    | P    | B/γ  | SE   | z    | P    |
|---------------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Average Temperature       | -0.006 | 0.005 | -1.23 | 0.219 | 0.009 | 0.003 | 2.58 | 0.010 | 0.011 | 0.004 | 3.10 | 0.002 |
| Percent Rice              | -0.69 | 0.15  | -4.55 | < 0.001 | -0.79 | 0.15  | -5.13 | < 0.001 | -0.79 | 0.15  | -5.13 | < 0.001 |
| Day of the Week           | -0.07 | 0.01  | -6.68 | < 0.001 | -0.07 | 0.01  | -6.68 | < 0.001 | -0.07 | 0.01  | -6.79 | < 0.001 |
| Internet Penetration 2007 | 0.39  | 0.50  | 0.79  | 0.429 | 0.67  | 0.21  | 3.23 | 0.001 | 0.66  | 0.17  | 3.83 | < 0.001 |
| Percent Rice              | -0.53 | 0.10  | -5.35 | < 0.001 | -0.54 | 0.08  | -6.64 | < 0.001 | -0.07 | 0.01  | -6.20 | < 0.001 |
| Day of the Week           | -0.07 | 0.01  | -6.92 | < 0.001 | -0.07 | 0.01  | -6.92 | < 0.001 |
| Time of Day               |       |      |      |      | -0.07 | 0.01  | -6.92 | < 0.001 |
| % Nonlocal Residents      | -0.007 | 0.007 | -1.05 | 0.293 | 0.002 | 0.005 | 0.39 | 0.700 | 0.004 | 0.005 | 0.94 | 0.350 |
| Percent Rice              | -0.41 | 0.15  | -2.69 | 0.007 | -0.46 | 0.13  | -3.58 | < 0.001 | -0.07 | 0.01  | -6.49 | < 0.001 |
| Day of the Week           |       |      |      |      | -0.07 | 0.01  | -6.49 | < 0.001 |
| Time of Day               |       |      |      |      | -0.07 | 0.01  | -6.49 | < 0.001 |
| % Employed Service Sector | 0.007 | 0.004 | 1.63 | 0.103 | 0.007 | 0.002 | 4.39 | < 0.001 | 0.007 | 0.002 | 3.94 | < 0.001 |
| Percent Rice              | -0.46 | 0.08  | -6.15 | < 0.001 | -0.48 | 0.08  | -6.31 | < 0.001 | -0.07 | 0.01  | -6.15 | < 0.001 |
| Day of the Week           |       |      |      |      | -0.07 | 0.01  | -6.15 | < 0.001 |
| Time of Day               |       |      |      |      | -0.07 | 0.01  | -6.15 | < 0.001 |
| % in Private Industry     | -2.83 | 2.55  | -1.11 | 0.268 | 2.46  | 6.35  | 0.39 | 0.699 | 0.14  | 4.53  | 0.03 | 0.975 |
| Percent Rice              | -0.52 | 0.30  | -1.74 | 0.082 | -0.43 | 0.23  | -1.87 | 0.061 | -0.07 | 0.01  | -6.43 | < 0.001 |
| Day of the Week           |       |      |      |      | -0.07 | 0.01  | -6.43 | < 0.001 |
| Time of Day               |       |      |      |      | -0.07 | 0.01  | -6.43 | < 0.001 |
| % Self-Employed           | 4.77  | 2.73  | 1.75 | 0.080 | 1.24  | 4.49  | 0.28 | 0.782 | 1.75  | 3.62  | 0.48 | 0.629 |
| Percent Rice              | -0.39 | 0.20  | -1.91 | 0.056 | -0.38 | 0.17  | -2.43 | 0.015 | -0.07 | 0.01  | -6.47 | < 0.001 |
| Day of the Week           |       |      |      |      | -0.07 | 0.01  | -6.47 | < 0.001 |
| Time of Day               |       |      |      |      | -0.07 | 0.01  | -6.47 | < 0.001 |
| Pathogen Prevalence       | -0.26 | 0.59  | -0.44 | 0.661 | -0.54 | 0.23  | -2.40 | 0.016 | -0.61 | 0.24  | -2.57 | 0.010 |
| Percent Rice              | -0.63 | 0.11  | -6.00 | < 0.001 | -0.71 | 0.11  | -6.55 | < 0.001 | -0.07 | 0.01  | -5.47 | < 0.001 |
| Day of the Week           |       |      |      |      | -0.07 | 0.01  | -5.47 | < 0.001 |
| Time of Day               |       |      |      |      | -0.07 | 0.01  | -5.76 | < 0.001 |
Note: Day of the week is coded numerically: Monday = 1 to Sunday = 7. Time of day is rounded to the nearest hour. Model is an HLM using the binomial GLMER function. Data is grouped at the city level. Employment data is from the 1996 statistical yearbook. Average temperature is the average for the city (taking the average of January and July temperatures). Shaded rows correlate opposite from theory prediction.
Table S9
How Well Do Other Major Theories of Culture Predict Chair Moving?

|                          | B/γ  | SE  | z    | P    | B/γ  | SE  | z    | P    | B/γ  | SE  | z    | P    |
|-------------------------|------|-----|------|------|------|-----|------|------|------|-----|------|------|
| Average Temperature     | -0.03| 0.01| -3.39| < 0.001 | -0.04| 0.01| -3.66| < 0.001 | 0.01| 0.03| 0.48| 0.634 |
| Employee                | 2.02 | 0.30| 6.63 | < 0.001 | 2.01 | 0.31| 6.54 | < 0.001 | 2.01| 0.31| 6.54 | < 0.001 |
| Percent Rice            | -2.60| 1.25| -2.09| 0.037  |      |     |      |      |      |     |      |      |
| Internet Penetration 2007| -1.92| 1.65| -1.16| 0.245  | -2.69| 1.71| -1.58| 0.115 | -0.79| 1.06| -0.74| 0.453 |
| Employee                | 2.05 | 0.31| 6.69 | < 0.001 | 2.05 | 0.31| 6.61 | < 0.001 | 2.05| 0.31| 6.61 | < 0.001 |
| Percent Rice            | -1.86| 0.54| -3.46| < 0.001 |      |     |      |      |      |     |      |      |
| % Nonlocal Residents    | -0.05| 0.03| -1.51| 0.130  | -0.06| 0.03| -1.96| 0.050  | -0.02| 0.02| -0.89| 0.375 |
| Employee                | 2.12 | 0.37| 5.69 | < 0.001 | 2.10 | 0.38| 5.58 | < 0.001 | 2.10| 0.38| 5.58 | < 0.001 |
| Percent Rice            | -1.74| 0.64| -2.70| 0.007  |      |     |      |      |      |     |      |      |
| % Service Sector        | -0.008| 0.019| -0.43| 0.671  | -0.014| 0.021| -0.67| 0.505  | -0.006| 0.009| -0.64| 0.524 |
| Employee                | 2.04 | 0.31| 6.66 | < 0.001 | 2.04 | 0.31| 6.60 | < 0.001 | 2.04| 0.31| 6.60 | < 0.001 |
| Percent Rice            | -1.97| 0.49| -4.00| < 0.001 |      |     |      |      |      |     |      |      |
| % in Private Industry   | -51.00| 17.10| -2.07| 0.003  | -49.79| 21.77| -1.20| 0.230  | -24.77| 22.52| -1.10| 0.271 |
| Employee                | 2.03 | 0.37| 5.54 | < 0.001 | 2.05 | 0.37| 5.53 | < 0.001 | 2.05| 0.37| 5.53 | < 0.001 |
| Percent Rice            | -1.19| 0.88| -1.35| 0.176  |      |     |      |      |      |     |      |      |
| % Self-Employed         | 32.03| 19.11| 1.68 | 0.093  | 38.68| 19.43| 1.99 | 0.047  | 20.69| 13.78| 1.50 | 0.133 |
| Employee                | 2.13 | 0.37| 5.70 | < 0.001 | 2.13 | 0.38| 5.66 | < 0.001 | 2.13| 0.38| 5.66 | < 0.001 |
| Percent Rice            | -1.74| 0.59| -2.94| 0.003  |      |     |      |      |      |     |      |      |
| Pathogen Prevalence     | 5.05 | 2.95| 1.71 | 0.087  | 6.42 | 2.80| 2.29 | 0.022  | 2.63 | 2.57| 1.02 | 0.307 |
| Employee                | 2.63 | 0.51| 5.17 | < 0.001 | 2.57 | 0.50| 5.13 | < 0.001 | 2.57| 0.50| 5.13 | < 0.001 |
| Percent Rice            | -2.80| 1.44| -1.94| 0.053  |      |     |      |      |      |     |      |      |

Note: Data is grouped at the city level. Employment data is from the 1996 statistical yearbook. Average temperature is the average of January and July temperatures. Shaded rows correlate opposite from theory prediction.
Table S10

*Sitting Alone Models with Stores Nested in Districts Nested in Cities*

|                              | B/γ  | SE  | z    | P    |
|------------------------------|------|-----|------|------|
| Percent Rice                 | -0.31| 0.16| -1.96| 0.050|
| Day of the Week              | -0.06| 0.01| -4.24| < 0.001|
| Time of Day                  | -0.08| 0.01| -5.44| < 0.001|
| Percent Rice                 | -0.34| 0.17| -2.00| 0.046|
| International Chain          | 0.24 | 0.09| 2.60  | 0.009|
| Day of the Week              | -0.06| 0.01| -4.13 | < 0.001|
| Time of Day                  | -0.08| 0.02| -5.58 | < 0.001|
| Percent Rice                 | -0.47| 0.16| -2.94 | 0.003|
| International Chain          | 0.24 | 0.09| 2.64  | 0.008|
| Day of the Week              | -0.05| 0.01| -4.03 | < 0.001|
| Time of Day                  | -0.09| 0.01| -5.84 | < 0.001|
| GDP per Capita               | 0.02 | 0.01| 1.56  | 0.120|
| Percent Rice                 | -0.57| 0.15| -3.86 | < 0.001|
| International Chain          | 0.23 | 0.09| 2.57  | 0.010|
| Day of the Week              | -0.05| 0.01| -3.88 | < 0.001|
| Time of Day                  | -0.09| 0.01| -5.96 | < 0.001|
| District GDP per Capita       | 0.02 | 0.01| 3.23  | 0.001|
| Percent Rice                 | -0.60| 0.20| -2.96 | 0.003|
| International Chain          | 0.25 | 0.09| 2.69  | 0.007|
| Day of the Week              | -0.05| 0.01| -3.88 | < 0.001|
| Time of Day                  | -0.09| 0.01| -5.85 | < 0.001|
| Population Density           | 0.06 | 0.03| 1.78  | 0.075|

Note: Models are HLMs using the binomial GLMER function.
Table S11  
*Chair Moving Models with Stores Nested in Districts Nested in Cities*

|                                          | $B/\gamma$ | SE  | $z$   | $P$     |
|-----------------------------------------|------------|-----|-------|---------|
| Employee                                | 2.21       | 0.36| 6.18  | < 0.001 |
| Percent Rice                            | -2.20      | 0.86| -2.57 | 0.010   |
| District GDP per Capita                  | 0.03       | 0.03| 0.88  | 0.382   |
| Employee                                | 2.23       | 0.36| 6.25  | < 0.001 |
| Percent Rice                            | -2.12      | 0.90| -2.36 | 0.018   |
| City Log GDP Per Capita                  | 0.45       | 0.72| 0.62  | 0.538   |
| Employee                                | 2.22       | 0.35| 6.26  | < 0.001 |
| Percent Rice                            | -1.77      | 0.86| -2.05 | 0.040   |
| Population Density                      | -0.01      | 0.12| -0.05 | 0.960   |

Note: Models are HLMs using the binomial GLMER function.
Table S12
Chair Moving Models with Stores Nested in Districts Nested in Cities

|                      | B/γ  | SE   | z    | P    |
|----------------------|------|------|------|------|
| Day of the Week      | -0.08| 0.01 | -8.15| < 0.001 |
| Time of Day          | -0.07| 0.01 | -7.73| < 0.001 |
| Time of Day          | -0.07| 0.01 | -6.79| < 0.001 |
| Day of the Week      | -0.07| 0.01 | -6.31| < 0.001 |

Note: Models are HLMs using the binomial GLMER function.
S1. Rice Statistics

Rice statistics at the province level were the same 1996 statistics as in our prior study (1). Shanghai and Beijing are their own provinces, but the administrative borders include surrounding farmland, so we used the statistics for these provinces. As a gut check, Shanghai and Beijing’s percentages are similar to surrounding provinces (Jiangsu and Zhejiang for Shanghai; Hebei for Beijing). For Hong Kong, we used rice statistics from Guangdong Province, which borders Hong Kong. Guangdong is a part of the Cantonese cultural region, and is a major source of Hong Kongers historically.

S2. Chair Moving

In the main text, we write that observers only coded the first time a person walked through the chair trap. The one exception to this rule was for employees. Because employees all wear the same uniform, we worried that it would be difficult to remember which employee had walked through the chairs or not. Thus, we recorded all of the times employees walked through the chair trap. In the main text, we present analyses excluding employee observations altogether.

During observations in the US, coders realized that some café patrons were overweight to an extent that they had to move the chair. This was highly rare in China or Japan. Thus, coders added a column representing whether patrons were overweight to an extent that would affect whether or not they moved the chair. Because these patrons had no choice but to move the chairs, we excluded them from the analysis. Including them would increase the percentage of Americans moving the chair.

S3. Controlling for Observer

Besides the reliability checks, two coders made observations independently. Did the effect depend on the observer? We ran a model with a dummy variable representing Observer 1 versus Observer 2, as well as an interaction term between rice and observer. There was no significant main effect of observer $B = 0.19, P = 0.854$, nor interaction between observer and rice $B = 0.67, P = 0.655$. Thus, the effect did not depend on which observer recorded the data.

S4. Hong Kong GDP Per Capita

We were unable to find GDP per capita data at the district level for Hong Kong. However, we were able to find 2013 median monthly household income for each district and Hong Kong as a whole. We used that to estimate GDP per capita for different districts. To do that, we calculated the percentage of each district compared to the value for Hong Kong as a whole. For example, if Hong Kong as a whole has a monthly household income of $1,000, and Kowloon District earns $1,100, Kowloon’s percentage would be 110%. Then we multiplied these percentages by Hong Kong’s GDP per capita in 2013 to get estimates of GDP per capita at the district level.

Although this is not ideal, these figures should provide rough estimates of GDP per capita. We also tried excluding Hong Kong as a whole, but the results were similar to the results in the main paper: GDP per capita at the district level was not significant $\gamma = -.03, P = 0.690$, $r_{\text{dist-level}} = -0.14$.

S5. Age in Districts

We tested whether younger districts would be more likely to have people sitting alone. However, age data for different cities and provinces across China are surprisingly hard to compare. Different regions use different age brackets, which makes them difficult to compare. The most widely used category across cities was 65 years and older. Beijing, Shanghai, and Hong Kong had data for this age category at the district level for 2013.

This data is not ideal for a couple reasons. First, it does not include Nanjing or Guangzhou. Second, the percentage of people 65 and above does not directly measure all age categories.
However, there is strong variation in age across districts. In Shanghai, people 65 and above made up 6.9% of the population in Minhang District and 24.5% in Jing’an District. If age has a strong influence, differences this large should be able to allow us to detect that influence. Older districts also tended to be wealthier.

S6. Calculating Effects Sizes in GLMER

The GLMER function in R does not provide effect size estimates. To calculate effect sizes, we used the change in the province-level variance (pseudo-$R^2$) of the model with and without the key predictor. We took the square root of this to get the correlation $r$, which is a more familiar effect size. The regression tables present all of the unstandardized regression coefficients. It should be noted that group-level effect sizes tend to be larger than individual-level effect sizes (for example, a group-level correlation would be the correlation between US state-level income and state-level percent voting Democrat; that same individual-level correlation would be individual income and that individual voting Democrat).

In some cases, the effect size of rice at the city level was close to $r = 1$. That’s possible with only 5 cities and when the pattern of chair moving fits well with rice. In cases where the effect size estimate approached 1, we also provided individual-level effect size estimates. These have the benefit of having a much larger sample, although they have the drawback of measuring a group-level phenomenon at the level of the individual.

When GLMER effect size estimates approached 1, we used an alternative method to calculate effect size. First, we calculated means for each group (city or district). Second, we calculated a simple correlation (such as between city rice percentage and percentage of people sitting alone). The downside of this method of estimating effect sizes is that it does not take into account the different sample sizes of the different groups. Thus, it would treat a district with 50 observations the same as a district with 2,000 observations.

In the case of the non-significant relationship between district-level age and chair moving (controlling for rice), the GLMER gave a negative regression coefficient, but the simple group-level correlation was positive. In this case, we compared a model with rice alone to a model with rice and age, then took the chi squared value and calculated an effect size ($r$) based on that. Because of these issues with effect size estimates in GLMER, readers wanting the most literal measure of effect size should use the unstandardized regression coefficients.

S7. Graphing Mean Percent Sitting Alone

To estimate the mean percentage of people sitting alone in Figure 2, it was important to control for time of day effects. Thus, to create Figure 2, we calculated means and standard errors using a binomial generalized linear model that took into account time of day and day of the week.

To estimate means in Figure 3, we limited the analysis to the main part of the day where we had at least 100 observations each from rice and wheat regions. This ensures that the mean estimates in the graph reflect the most adequately sampled hours of the day. All statistical analyses include all day parts.

S8. GDP Per Capita

For GDP per capita, we ran analyses using GDP and log GDP per capita. Results were similar regardless of which version was used. Hong Kong is a strong outlier in GDP per capita, so we re-ran analyses excluding Hong Kong. Results were largely similar.

S9. Alternative Predictors

We used several alternative predictors that other researchers have used to predict cultural differences:

- To calculate average temperature, we added the average temperature in the hottest month (July) and coldest month (January).
• For pathogen prevalence, we used human-transmitted diseases from a 1976 study in China plus more recent figures from the Chinese Statistical Yearbook. For more details, see the supplemental materials of our previous study (1).

• Internet penetration data came from 2007 (1). Internet penetration rates after 2007 are so high they approach a ceiling effect, with little variation between places.

• Percentage of non-local residents came from the 2010 National Census (section: 我国流动人口最新状况).

• There is evidence that historical indicators of economic development predict cultural differences better than economic indicators right now (1, 36). Thus, we used economic indicators from the 1996 Statistical Yearbook for percent employed in private industry, percent self-employed, and percent employed in the service sector. However, the main text uses 2013 GDP per capita. Thus, the analyses cover both modern and historical economic indicators (20 years prior).

Because our earlier study did not include Hong Kong, we had to search for Hong Kong statistics. For some of these variables, Hong Kong has easily available statistics, so we added Hong Kong for these (internet penetration and employment in service sector). For pathogen prevalence, we used the value for Guangdong because (a) the indicator is historical, and Hong Kong was largely settled by people from Guangdong and (b) the measure of pathogen prevalence came from a study in Mainland China and is not directly comparable to data sources for Hong Kong. Excluding Hong Kong from the pathogen prevalence analysis made little difference to the results. For other variables, we left Hong Kong blank because the original data source did not include Hong Kong and could be hard to compare directly (sociogram self-inflation, percent employed in private industry, percent self-employed, and percent non-local residents).

S10. Chair Moving Validity Checks

To test whether chair moving reflects psychological constructs that differ between individualistic and collectivistic cultures, we tested a sub-sampled of café-goers (N = 42) on several psychological measures. After passing the chair trap, a research assistant approached the café-goer with a paper questionnaire that included measures of psychological constructs. Because more people do not move the chair than move the chair, research assistants approached every chair mover and every fourth non-mover.

First, participants completed five items measuring self-efficacy (40). For example, one item read, “I can always manage to solve difficult problems if I try hard enough” (如果我努力去做的活，我总是能解决难题的). Participants rated each item from one (strongly disagree) to seven (strongly agree).

Participants also completed five items measuring internal versus external locus of control (38). Participants read competing statements, one that emphasizes control over one’s own life and one that emphasizes external forces. Participants have to choose the statement they agree with more. For example, one statement reflecting internal control read, “When I make plans, I am almost certain that I can make them work.” The statement reflecting external control read, “It is not always wise to plan too far ahead because many things turn out to be a matter of good or bad fortune anyhow.” We coded the number of internal locus statements participants chose. Because these statements are binary choices, we analyzed responses as a series of binomials, using the GLM function (with a binomial link) in the program R. We used Nagelkerke r-squared as a measure of effect size.

Participants also completed the 10-item triad categorization task (37). In each triad, participants see three words, such as panda, banana, monkey. In each triad, two items can be paired together because they belong to the same abstract category (pandas and monkeys are mammals) and two because they share a functional relationship (monkeys eat bananas). People in
China and Hong Kong tend to choose more relational pairings than Americans, and people in cultures with more interdependent historical subsistence styles tend to choose more relational pairings than people in cultures with more independent subsistence styles (1, 3, 4, 37).

As in our prior research (1, 34), we analyzed eight items, excluding two items that have a slightly different structure. In most items, there is one pairing that does not fit either type of categorization. This allows us to screen out non-serious responding. However, for two items, any pairing leads to a sensible response, such as with stamp, postcard, letter. Yet non-sensible responses are rare, and, in our experience, results are highly similar whether these two items are included or not. Similar to the internal locus of control analysis, the triad task is best analyzed as a series of binomials (relational vs. categorical). We analyzed it using a GLM with a binomial link in the program R.

Participants also reported their gender, age, social status, and where they grew up. Based on where people grew up, we coded whether participants grew up in rice (> 50% farmland devoted to rice) or wheat regions (< 50%). For the triad task, the main text reports the simple results. Controlling for gender, age, social status, and rice/wheat, the difference between chair movers and non-movers remained significant ($P = 0.008$). For internal locus of control, we found a non-significant trend whereby people from rice areas reported less internal locus of control ($P = 0.313$), which we included in other analyses. Controlling for age, gender, rice/wheat, and social status, the difference between chair movers and non-movers remained in the marginally significant range ($P = 0.130$).

Participants also completed the sociogram task (12). In the sociogram task, participants draw a diagram of their social network, using circles to represent the self and friends. Researchers then measure the size of the self and friend circles and calculate whether participants drew the self larger than they drew friends (self-inflation). People from individualistic cultures tend to self-inflate more than people from collectivistic cultures (12).

Despite the small sample, there was a marginal trend whereby people from rice areas self-inflated less than people from wheat areas $B = -2.90, P = 0.143$. This fits with prior findings (1), although the sample is small and should not be considered adequately powered for this test. There was a non-significant trend whereby people who moved the chairs had more self-inflation $B = 2.90, P = 0.233$. However, there was also an interaction between chair moving and gender $B = -7.78, P = 0.040$. The interaction revealed that, among men, chair movers showed more self-inflation. Among women who moved the chair, this was not the case. However, because the sample is small, this pattern should be considered tentative.

**S11. Ethics Statement**

These studies were carried out in accordance with ethical and Institutional Review Board guidelines.