Rice versus Wheat Cultures in China:

An Investigation into Self Enhancement and Cultural Tightness

Meng Du

University of Michigan

Mentor: Shinobu Kitayama

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Correspondence concerning this article should be addressed to Meng Du, 1835 Shirley Ln Apt B7, Ann Arbor, MI 48105.

Abstract

Talhelm et al. (2014) hypothesized that Chinese from northern provinces (traditionally wheat-growing regions) are more independent or less interdependent than those from southern provinces (traditionally rice-growing regions). One reliable index of independence is self-enhancement, which is when a person estimates that a small percentage of people are better than oneself. We asked Chinese college students recruited in Beijing to estimate the percentage of their classmates who would be higher than themselves on three evaluative dimensions (competence, independence, and interdependence) and found the northern participants to be systematically more self-enhancing (reporting smaller percentage estimates) as compared to their southern counterparts. Unexpectedly, the northern participants reported their home regions to be tighter in the enforcement of social norms than the southern participants did. The results were discussed in terms of characteristics of the student populations in the Beijing area.

Keywords: cultural psychology, China, rice theory, self enhancement, tightness

Over the past few decades, cultural psychology research has focused on the study of Eastern and Western cultures, and documented various differences between the two groups especially in the dimensions of independent versus interdependent social orientations and analytic versus holistic cognitive styles. Specifically, Western people tend to be individualistic, think analytically, and have independent self-construals separated from others, while people from Eastern Asian cultures are more likely to be collectivistic, holistic-thinking and possess interdependent self-construals overlapping with close others (Markus & Kitayama, 1991; Nisbett, Peng, Choi, & Norenzayan, 2001; Triandis, 1995). Although other factors such as age, gender, social class and educational attainment have also been found to play a role in social orientation, their effects are generally weaker than culture (Kitayama et al., 2014).

The cultural distinction on social orientation has been confirmed by a number of behavioral studies, as well as evidence from neurosciences. For example, European Americans tended to prefer uniqueness, which was associated with positive signs such as freedom and independence; by contrast, Asian Americans were likely to value conformity and harmony more than being different from others (Kim & Markus, 1999). Additionally, researchers found that the subjective wellbeing of Asian Americans was increased when achieving interdependent goals that pleased their parents or friends and promoted social harmony, while European Americans were more motivated to pursue independent goals for personal enjoyment (Oishi & Diener, 2001; Uchida & Kitayama, 2009). Moreover, different brain activation patterns were also found between Eastern and Western people with different self-construal. Specifically, Zhu, Zhang, Fan and Han (2007) employed functional MRI to examine subjects' brain activity when they were asked to judge adjectives describing the traits of their mothers, themselves and other people, respectively. The results showed that for Chinese participants, both self- and mother-judgments

involved a stronger activation of medial prefrontal cortex (MPFC), which was known to be related to self-representation; for Western subjects, however, only self-judgments involved a stronger MPFC activity, and the difference between mother- and other-judgments was not significant. This study demonstrated the cultural difference of neural substrates engaged in self-construal, and extended the previous findings in cultural psychology to the level of the brain.

Besides social orientation, the Western-Eastern cultural difference also extends to cognitive styles, i.e. analytic versus holistic cognitive patterns. For example, Morris and Peng (1994) found that Chinese tended to explain events using situational factors, while Americans were more likely to attribute results to personal dispositions. The same pattern was also found in their research with Chinese versus English newspaper articles when explaining the same crimes (Morris and Peng, 1994). Moreover, Masuda and Nisbett (2001) showed that compared to Americans, the Japanese were likely to pay more attention to the contextual information and relationship between contents in the images presented to them. Furthermore, the different cognitive patterns also showed in reasoning and categorization. Norenzayan, Smith, Kim and Nisbett (2002) found that when reasoning, Americans were more likely to adopt a formal and analytical strategy, while East Asians were more intuitive and tended not to separate form from content. Also, East Asians tended to group objects according to relationship rather than category, while Americans showed the opposite, and this cultural effect can be found independently from language (Ji, Zhang, Nisbett, 2004).

Sources of East-West Cultural Differences

While more studies are extending the list of Western-Eastern cultural differences, researchers have also been trying to answer the question what has led to these differences.

Several studies revealed the association between modernized societies and independent

social orientation. Modernization and economic development, together with the associated social transition, could make people change their traditionally interdependent value and lifestyle to more independent social behavior and more abstract cognition (Greenfield, Maynard, & Childs, 2003; Greenfield, 2009). Covering 75% of the world population, the World Value Survey also demonstrated the cultural change associated with modernization. Specifically, Inglehart and Baker (2000) found that together with economic development and industrialization, people's worldview changed, traditional values tended to be replaced with more rational and secular values, and the importance of family life was less emphasized.

Nonetheless, Fincher, Thornhill, Murray and Schaller (2008) proposed the pathogen prevalence as another predictor for cultural collectivism and individualism. They suggested that certain characteristics of collectivism, such as caution for out-group contact and intolerance for social deviance, helped people survive in the prevalence of infectious diseases, and were therefore integrated as a part of their culture. They found a correlation between the pathogen prevalence data and measurements of individualism-collectivism independently from economic development, which supported their hypothesis.

Breeding different lifestyles and values, the traditional economic activity is yet another crucial factor that has been found as a source of independence-interdependence cultural distinction. Uskul, Kitayama, and Nisbett (2008) examined the influence of farming, fishing and herding lifestyles on analytical versus holistic cognition with the population in Turkey's eastern Black Sea region, where the three type of activities coexisted in an area historically isolated from the inner land. The researchers tested attention and categorization styles with the participants, and suggested that farming and fishing, as group collaboration activities with fixed communities, were linked to more holistic cognitive style; herding, in contrast, requires more individual efforts

and autonomy, which was linked to analytical cognition.

Moreover, Talhelm et al. (2014) also demonstrated the significant impact of traditional lifestyles on social orientation. Specifically, they proposed that a history of growing paddy rice, which requires significant efforts and cooperation between neighbors, would form an interdependent culture, while a history of farming wheat would lead to an independent culture. Their hypothesis was confirmed by a large-scale data collection in China, where both rice and wheat have been farmed for thousands of years. In their study, the categorization task, the sociogram task, the loyalty and nepotism task, the divorce rates and the number of successful patents were used to measure the cultural difference between northern and southern China. All of these tasks or measures have been typically used in previous research to show the differences between Eastern and Western culture. In the categorization task, Easterners tended to group objects according to functional relationships (e.g. the rabbit eats the carrot) rather than abstract category (e.g. the rabbit and the dog are both animals), while Westerners showed the opposite (Ji, Zhang, Nisbett, 2004). In the sociogram task, each participant was asked to draw a graph of his/her social network, and when the size of the circles representing themselves versus others were measured, Westerners typically showed more self-inflation than Easterners – Americans and Western Europeans drew themselves bigger than the other people while the Japanese did not (Kitayama, Park, Sevincer, Karasawa, & Uskul, 2009). In the loyalty and nepotism task, the participants were placed in business situations where the honesty of either their friend or a stranger affected how much money they could make, and the participants had the chances to award them for honesty or punish them for lying. It was shown that Singaporeans were much more likely to reward their friends and less likely to punish them compared to strangers, whereas Americans did not show such a sharp distinction between friends and strangers (Wang, Leung,

See, & Gao, 2011). Finally, prior studies have also shown that individualistic cultures were associated with higher divorce rate (Lester, 1995) and more successful patents (Shane, 1992) after GDP per capita was controlled.

In all of the above tasks, the results from Talhelm et al. (2014) showed a consistent cultural difference between northern (the wheat region) and southern China (the rice region). The southern Chinese demonstrated more collectivism, holistic thinking, lower divorce rate and less successful patents, while the northern Chinese showed the opposite and were more similar to Westerners. Importantly, to eliminate other influential factors such as different climates and dialects between the north and the south, the researchers also analyzed data from the counties along the wheat-rice border where climate, geography and politics factors were similar. They showed that even in these counties, the difference in people's thinking styles still existed in a similar effect size as the whole of China. Moreover, the researchers also examined the modernization theory by collecting the GDP per capita, and the pathogen prevalence theory by pathogen rates, but both theories failed to fit their results.

Although the rice theory was successful in explaining the cultural difference within China, the effect size of the northern-southern China cultural difference was much smaller than that of the Western-Eastern differences, implying that the rice-wheat agriculture might only partially account for the variance (Talhelm et al., 2014).

The Current Study

The relatively homogeneous ethnic and political factors make China a great test case for the rice theory. The current study focuses on one aspect of the within-culture regional variation identified by Talhelm et al. (2014). Talhelm et al. found that the northern Chinese have bigger symbolic selves as compared to their southern counterparts. Specifically, they asked participants

to draw their social networks, using circles to represent themselves and their friends or family members. The results showed that the northern Chinese (from the wheat region) tended to draw a bigger circle for the self than for the others. This effect, however, was less pronounced for the southern Chinese (from the rice region). This contrast on self-inflation is similar to the difference between Europeans and the Japanese, as found in a prior study (Kitayama, Park, Sevincer, Karasawa, & Uskul, 2009). The sociogram task thus well illustrated the wheat-rice regional difference, and fitted the prediction of the rice theory.

In the current work, we used an alternate measure of self-enhancement to further examine the cultural difference between northern and southern China. In independent cultures where a person typically views himself/herself uniquely standing apart from others, self-enhancement effectively promotes one's self-esteem and helps one maintain a positive feeling. For those from an interdependent culture, in contrast, self-enhancement is not that crucial because the source of self-esteem and positive feelings can com from fitting in the group and maintaining the harmony, rather than focusing on oneself (Markus & Kitayama, 1991). Markus and Kitayama (1991) studied the effect of self-enhancement with Japanese and American subjects. In their task, participants were asked a series of questions to estimate a percentage of students in their university who were better than themselves (e.g. have higher intellectual ability, are more independent, are more sympathetic, etc.). The questions were divided into three categories: abilities, independence and interdependence. The results showed that in all three categories, Americans tended to estimate less people (34% on average) than the Japanese (49% on average) to be better than themselves, i.e. the Americans showed more self-enhancement than the Japanese. They also found a gender difference, where women typically showed less self-enhancement than men.

Inspired by the previous research, we predict that northern and southern Chinese will also show a difference on this self-enhancement task, similar to that of Americans and Japanese. That is, the northern Chinese will be more self-enhancing (i.e., reporting small percentage estimates of others who would be better than themselves), as compared to the southern Chinese.

In addition, we included several other tasks to examine whether the northern-southern cultural difference also extends to other measures. They are not included in this report because the results from them are still under investigation.

Study 1

Study 1 was conducted at the Beijing Normal University, which follows a national educational policy and admits students more evenly across the nation as compared to the other universities, therefore the student sample there was more representative. Noticeably, Talhelm et al. (2014) also took advantage of this policy and recruited their largest sample at the Beijing Normal University, which composed more than 40% of their subjects.

Method

Participants. The participants were volunteers recruited at the Beijing Normal University. They were all native Chinese speakers and born and raised in China. A total of 104 participants completed this study and provided valid responses.

Procedure. The participants were asked to show up at the lab at the scheduled times, and complete a set of online questionnaires (described in detail below) using the computers there. Afterwards, each participant received a compensation of 40 Chinese Yuan and were debriefed and dismissed.

Tasks. Using a set of questionnaires adopted from previous cross-cultural research, we tested the cultural differences between northern and southern Chinese population in several

dimensions. The current report focuses on two of them: 1) self-enhancement and 2) tightness/looseness.

Self-enhancement (Markus & Kitayama, 1991). In this questionnaire, the participants were asked to estimate the percentages of their college classmates who were better than themselves in terms of different skills and traits, and who were more likely to go through certain positive or negative events in the future. A meta-analysis on prior self-enhancement studies revealed a consistent pattern that Westerners were much more likely to perceive themselves better than others, compared to East Asians (Heine & Hamamura, 2007).

Cultural tightness versus looseness (Gelfand, et al., 2011). Cultural tightness and looseness refer to the strength of social norms and the tolerance of deviant behaviors in a society – a tight culture would have strong social norms and low tolerance towards social deviance, and a loose culture would be the opposite (Gelfand, et al., 2011). Collecting data from 33 nations, Gelfand, et al. (2011) demonstrated that East Asians rated higher scores of tightness for their countries compared to Western people. Adopting this six-item scale from Gelfand, et al. (2011), we modified the instructions so that the participants needed to rate for the province where he or she had grown up, or spent the most time in before college. The tightness score is calculated by averaging the result of each question, after one of the items was reverse coded.

At the end of the session, the participants completed a demographics survey, and then were compensated.

Results

For data analysis, we divided the participants into northern and southern Chinese using the same criterion as in the study of Talhelm et al. (2014), i.e. those counties where more farmland was devoted to rice paddies than wheat were categorized as rice regions, and the

participants who grew up in these regions were coded as southern Chinese; the others were categorized as northern Chinese. Also same as the Talhelm et al. (2014) study, we excluded Xinjiang, Inner Mongolia and Tibet from data analysis because the major traditional activity in these provinces was herding, which could confound the results. In Study 1, none of the participants were from the herding culture and thus all of the 104 people remained in data analysis (mean age = 23.09, SD = 2.297), of which 43 were southern Chinese (17 males, 26 females) and 61 were northern Chinese (33 males, 28 females).

Self-enhancement. A two-way ANOVA was carried out to examine the effect of origin (north/south) and gender on self-enhancement. All of the participants showed a degree of self-enhancement. As predicted, we found the northern Chinese were consistently more self-enhancing than the southern Chinese in all three categories. The statistical difference is summarized in Table 1. A main effect of gender was also found in competence, where women showed less self-enhancement than men ($F = 3.634$, $p = 0.0595$); but the difference was not significant in independence or interdependence.

Cultural tightness versus looseness. Contradictory to what the rice theory may predict, northern China yielded a higher score in cultural tightness ($M_{north} = 4.13$) than southern China ($M_{south} = 3.88$) as measured by this questionnaire. The difference was marginally significant ($F = 3.502$, $p = 0.0642$). Also, women tended to give slightly higher scores in tightness compared to men ($M_{female} = 4.134$, $M_{male} = 3.909$, $F = 3.178$, $p = 0.0777$). No interaction effect between gender and origin was found.

Study 2

Study 2 aimed at replicating the results of Study 1 using a different sample of larger size, and was conducted online instead of on site. We used the same set of questionnaires as in Study

1.

Method

Participants. The participants were volunteers recruited in Beijing, China, including current students and graduates from several universities in the Beijing area, including Peking University, Beijing Forestry University, Renmin University of China, Beijing Normal University, Tsinghua University, and China University of Mining and Technology.

Procedure. The participants were contacted through emails and invited to complete our online survey, for which they would receive 100 Chinese Yuan as the compensation. In the email, they were asked to set aside about an hour to complete the questionnaires and avoid interruptions. All of the participants were born and raised in China before college, and spoke Chinese as the native language.

Excluding those who provided invalid responses (e.g. selected wrong answers in the validation questions, or provided an unclear answer about the province where he/she grew up in), we received a total of 539 responses.

Results

After excluding participants from the herding culture, 512 participants remained in the data analysis (mean age = 24.22, SD = 4.221), of which 210 were southern Chinese (101 males, 109 females) and 302 were northern Chinese (142 males, 160 females).

Self-enhancement. Consistent with Study 1, the northern Chinese were again found more self-enhancing than the southern Chinese in all categories. Table 2 summarizes the statistical difference. A marginally significant main effect of gender was found only in independence, and women were less self-enhancing than men ($F = 2.967$, $p = 0.0856$).

In Figure 1, we computed the mean of self enhancement data in each province and

visualized them. In this figure, each color represents 1% variation of self enhancement. The light grey areas are the provinces with herding tradition, and the dark grey areas are the provinces where we obtained a sample size smaller than 15 and therefore excluded from this analysis. The black line indicates the rice-wheat border between provinces, where the southern ones devote more farming land to rice paddies than wheat and the northern ones devote less land to rice paddies than wheat. The difference in self enhancement can be clearly seen between northern and southern provinces, and it does not seems to change merely as a function of latitude. Additionally, even along the rice-wheat border, the adjacent provinces still showed distinct degrees of self-enhancement. Figure 2 shows the relationship between the mean scores of self enhancement and the percentage of farmland devoted to rice paddies in each province. The agricultural data were retrieved from the website of the National Bureau of Statistics of China, and were the earliest data available ("分省区市农业户农作物播种面积构成", 1996).

Moreover, we performed the same two-way ANOVA with the Han Chinese only in order to rule out the potentially confounding influence of other ethnic groups. Specifically, we excluded the participants of non-Han ethnicity, and those who grew up in the provinces that were historically mainly occupied by non-Han Chinese, including Yunnan, Guangxi, Guizhou, western and southern Sichuan, Ningxia, Heilongjiang, Jilin and northern Liaoning. 444 participants remained in this test, of which 250 were northern Chinese (123 males, 127 females) and 194 were southern (95 males, 99 females). In this test, the main effect of origin in competence, independence and interdependence all remained (competence: M_{north} = 28.31%, M_{south} = 32.17%, F = 6.725, p = 0.00983; independence: M_{north} = 27.31%, M_{south} = 29.93%, F = 3.172, p = 0.0756; interdependence: M_{north} = 24.38%, M_{south} = 27.6%, F = 4.509, p = 0.0343). The effect of gender disappeared in this test of Han Chinese.

Cultural tightness versus looseness. The results in cultural tightness/looseness was consistent with Study 1, i.e. the northern Chinese rated a higher cultural tightness score than the southern Chinese (M_{north} = 4.145, M_{south} = 3.984, F = 7.723, p = 0.00567), and women rated a higher score compared to men (M_{female} = 4.128, M_{male} = 4.023, F = 3.406, p = 0.0656). We also performed the ANOVA with Han Chinese only, and the main effect of origin and gender both remained (M_{north} = 4.175, M_{south} = 4.001, F = 8.258, p = 0.00427; M_{female} = 4.151, M_{male} = 4.046, F = 3.102, p = 0.07896).

Discussion

The goal of the current study is to extend the previous findings on the cultural variation in northern and southern Chinese population with a highlight on self enhancement, and therefore to provide more insights into the origin of Eastern-Western cultural difference. To investigate the regional cultural difference, we administered a series of questionnaires with two different samples and methods (in-lab/online) to obtain robust results that are generalizable across participants and circumstances. The current study is the first one that used these questionnaires to test within-country variation between the rice-wheat regions, and it is also the first time for some of the questionnaires to be administered in China.

The first major finding of this study is the regional difference on self enhancement. Specifically, the northern Chinese (from the wheat region) demonstrated more self enhancement than southern Chinese (from the rice region), by estimating less college counterparts to be better than themselves in competence, independence and interdependence. This consistent finding fits our prediction, and provides supporting evidence to the rice theory. Talhelm et al. (2014) revealed that the northern Chinese showed more self-inflation than the southern Chinese when drawing their social network. Together with the current finding, we can conclude that the wheat-

region Chinese tend to focus more on themselves than the other people, and they perceive themselves better than the vast majority of their counterparts to build self-esteem. In contrast, the rice-region Chinese focus on themselves and the others around them at a same level, and the source of their self-esteem comes from their group and close others more than the wheat-region Chinese.

The second finding on cultural tightness versus looseness yielded interesting results that cannot be explained by the rice theory. According to Gelfand, et al. (2011) who administered this questionnaire in 33 nations, the European and North American countries typically resulted a higher tightness score than East Asian countries. They also suggested that people highly relied on growing crops for survival usually had stricter social norm, and thus a tighter culture. Therefore, the rice theory may predict that the rice region in China would yield a higher tightness score than the wheat region. However, our study found the reversed pattern, where northern China consistently resulted in higher tightness than southern.

We will discuss several potential causes of this effect. First, one might suspect that the area around a historical capital city perhaps maintains a tighter culture than the other areas, and the fact that almost all the historical capitals were located in northern China may lead to a tighter culture in the north. However, this possibility was eliminated by a further examination of our data. The reasoning behind this hypothesis is that in the capital of an empire, there would be a clearer social hierarchy, and the laws would be more strictly implemented to enhance the power of the emperor and the officials, which would possibly result in stricter social norm carried on until today. Nonetheless, we performed another analysis to determine whether there is a difference in cultural tightness between the provinces with and without historical capitals, and the difference was not significant. Additionally, the non-capital northern provinces still hold a

significant distinction from the southern provinces. Therefore, this possibility can be eliminated. Second, it is also possible that northern China had historically faced more social threats that resulted in a tighter culture there. Gelfand, et al. (2011) suggested that the social threat is an important source of cultural tightness, and it could be natural disasters, lack of resources, territorial invasion, spread of diseases, etc., which requires the people to coordinate and fight for survival. In the case of ancient China, wars between Han Chinese and Huns from the herding culture happened frequently in the northern part, for which the Great Wall was built from Gansu province all the way down to Liaoning province to protect the territory. Therefore, the wars, as a threat, may have contributed to the tightness in northern China.

Noticeably, although the difference between the northern and southern Chinese is consistent, the size of difference is relatively small compared to the Eastern-Western difference. Additionally, in the measure of self-enhancement, both northern and southern data (in Study 1, the overall means were 29% and 36% respectively, and in Study 2 they were 27% and 29%) were more similar to the American data rather than the Japanese data found in earlier research – for example, Markus and Kitayama (1991) found with the same task that the means for Americans and Japanese were 34% and 49%, respectively. There are several potential causes for this phenomenon.

First, it is likely that the frequent contact and communication between the rice and wheat region in China result in a more homogeneous Chinese society, and thus more similar social orientation and cognitive style in Chinese people. In contrast, the communication between Eastern and Western cultures is limited because of language, geographical and political barriers, which possibly have prevented the two cultures from learning and simulating each other. Additionally, most other countries investigated in previous research (e.g. Japan and America)

grew one major crop (either rice or wheat) in history. On the contrary, China could be seen as a case where the rice culture and wheat culture stay distinct in some ways, but also blend together in others.

Second, the fact that we recruited all the participants for this study in Beijing is also a possible reason. On one hand, most of the participants, including those who grew up in southern China, have at least some experience living in Beijing, and some of them have been living in Beijing for years including college and graduate study. As suggested by previous researchers, modernization and economic development makes a culture more independent and analytical thinking (Greenfield, Maynard, & Childs, 2003; Greenfield, 2009). Therefore, the experience living in a both northern and modernized city like Beijing may make southern Chinese slightly switch their mindset to acculturate to a relatively independent culture. On the other hand, it is also possible that the southern Chinese who moved to Beijing for college or graduate study are more independent than their counterparts who stayed close to home. The prior studies on residential mobility and voluntary settlement may support this possibility. Oishi, Lun and Sherman (2007) argued that those individuals who moved frequently would have unstable relationship to others and constantly changing group memberships, therefore it would be less likely for them to develop an interdependent self-construal closely related to others. In the case of this study, the southern Chinese who moved to Beijing probably had to change their previous relationships and establish new ones, which is a different experience compared to their peers (both northern and southern) who chose to stay close to home, and might result in a more independent social orientation than their southern counterparts.

Despite these potential factors that could have led to the small effect size in our study, we could still see a consistent and clear distinction between northern and southern China in terms of

self enhancement and cultural tightness. The current study thus extends the previous findings of rice-wheat regional differences (Talhelm et al., 2014) by demonstrating the consistent regional difference in self enhancement, and presented a novel finding in cultural tightness that has to be explained by factors other than the rice-wheat agricultural style.

Future research should further investigate the rice-wheat regional differences, and elaborate how the historical life style influences a culture in some ways but not others, or examine the other factors that contribute to the formation of a culture. Additionally, it is also worthy looking into the potential factors causing differences in cultural tightness versus looseness, such as historical wars and conflicts, and elaborate the model proposed by Gelfand, et al. (2011).

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Table 1

Self-enhancement of northern and southern Chinese in Study 1

	Northern Chinese		Southern Chinese			
	Male	Female	Male	Female	F	*p*
Competence	28.53%	35.24%	34.37%	41.35%	3.780	0.0547
Independence	27.29%	34.68%	34.88%	39.12%	3.277	0.0733
Interdependence	26.91%	23.49%	30.51%	33.50%	5.110	0.026

Table 2

Self-enhancement of northern and southern Chinese in Study 2

	Northern Chinese		Southern Chinese			
	Male	Female	Male	Female	F	*p*
Competence	28.03%	29.14%	33.17%	32.64%	8.973	0.00287
Independence	25.66%	28.52%	29.49%	31.23%	5.176	0.0233
Interdependence	24.88%	24.87%	26.63%	28.49%	3.733	0.0539

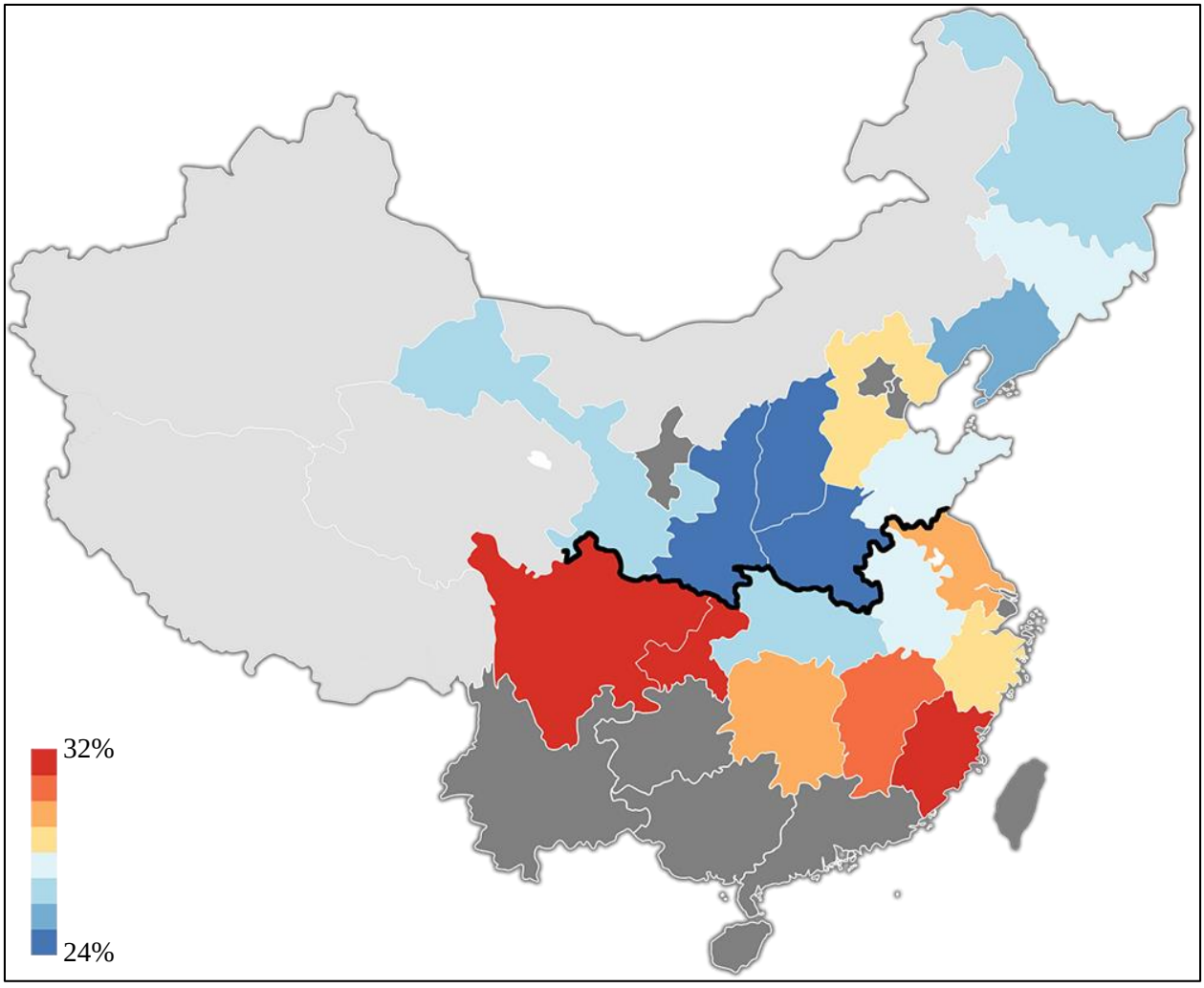

Figure 1. Self-enhancement in each province of China.

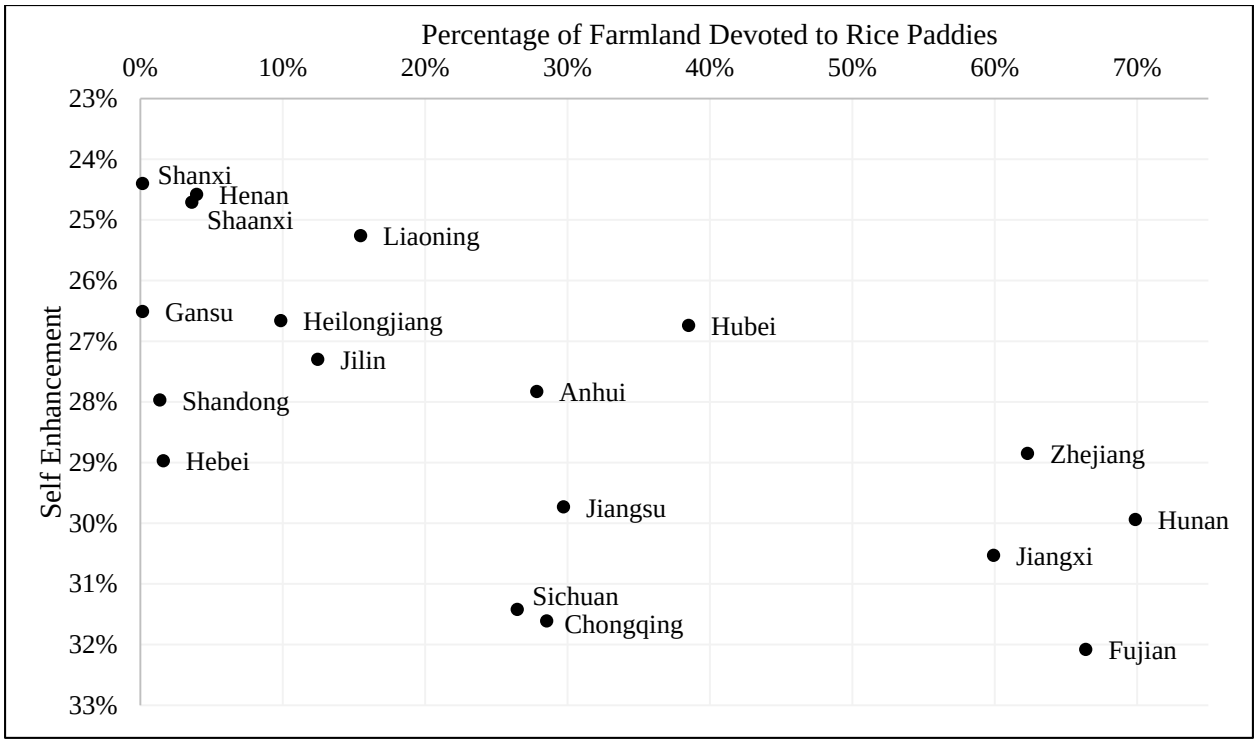

Figure 2. The relationship between composition of farmland and self enhancement