Risk Sharing Social Network among Chinese Migrant Workers:

Evidence from a Field Experiment

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Evidence has shown that an informal insurance mechanism is available within kinship and social networks in developing countries. This paper investigates whether the size of a family and social network is correlated with individual risk-taking behavior. We use a unique dataset containing detailed information on real-world risk-taking behaviors and risk and time preferences elicited from lab experiments for 1700 migrant workers in China. Our main finding is that family size is an important predictor of children's risk-taking behavior. We find that those with more siblings are willing to take on more risk in the lab experiment. Using one-child policy as an instrument for family size, we find that having more siblings also leads to a higher probability of being self-employed and moving farther away from the home province. Our findings suggest that the one child policy in China could lead to a more risk-averse generation.

Keyword: Risk Preference, Migrants, Kinship

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I. Introduction

An extensive literature (Townsend, 1994, Morduch, 1991, Paxson, 1992, Jacoby and Skoufias, 1997)[1] indicates that, in developing countries, consumption is rather smooth despite a shortage of formal insurance options. Many studies include Fafchamp and Lund (2003), Grimard (1997), De Weerdt (2002) and Dekker (2004) provide further evidence that informal partial insurance is available within networks of friends and siblings. Our main goal of the paper is to investigate whether having a more friends or siblings would affect an individual's willingness to take more risk.

Theoretically, this question can be re-framed as a moral hazard problem in a principal-agent model, where family and friends act as a principal and the agent would take more risk if the negative outcome is mostly born by the principal. Using a lab experiment, Barr and Genicot (2009) find that when risk sharing arrangements is available, participants take more risk in the lottery game. However, it is plausible that greater family size leads to greater financial burdens, thus one would be more conservative. To date, there has been little empirical evidence other than the lab experiment showing the relationship between the size of social network and individual's risk-taking behavior.

It is a difficult empirical question to answer due to a dearth of datasets with a clear measure of one's risk attitudes or risk taking behavior and measures of size of social network and family. We use a unique dataset—Urban Migrant Survey (UMS), which is a part of the Rural–Urban Migration in China (RUMiC) project. It contains detailed information on social network and risk and time preferences for more than 1700 migrant workers across 15 cities in 9 provinces. There are two unusual aspects to the survey, which could help us answer our question. First, the target population consists of migrant workers. These migrant workers were raised in rural areas and

[1] For a review of literature, see Besley (1995).

have left their homes to move to the urbanized zones along the east coast or the large inland cities. Given the unusual target population, a natural way to measure their risk-taking behavior is by measuring whether they have moved out of their home province or not, and we also have a continuous of measure of the distance they have moved. Secondly, UMS contains an experimental module, which contains pair-wise choice lotteries with real monetary payoff to elicit the risk and time preferences of the subjects. Moreover, in consideration of the findings of several recent studies that risk and time preference is correlated with cognitive ability (Dohmen et al., 2010; Benjamin et al, 2006), UMS also contains a module testing individual cognitive ability.

Our main finding is that family size is an important predictor of individual risk preference, but friend-based social network is not. We find that those with more siblings are willing to take on more risk in the lab experiment. Having more siblings is also positively correlated with being self-employed and moving out of one's home province.[2] However, one could imagine that the correlation is driven by a third factor—such as parental risk aversion. To further establish the causality between family size and one's risk taking behavior, we use exogenous variation in family size, induced by the one-child policy, to identify the causal effect. Using this instrument, our findings remain robust. Our findings suggest that having more siblings would make one more likely to become self-employed, move farther away and less likely to stay at their home provinces. We perform a series of robustness check which would be elaborated in Section 4.

This paper is organized as follows: Section 2 describes the survey methodology and experimental methodology. Section 3 illustrates regression results. Section 4 presents IV results and other robustness check. Section 5 concludes.

[2] Munshi and Rosenzweig (2006), suggest that, in India, the caste-based social networks could restrict one's mobility.

II. Data Description

2.1 Survey Design

The dataset used in this paper is from the Urban Migrant Survey, which is a part of the Rural–Urban Migration in China (RUMiC) research program. The RUMiC research program is a joint collaboration effort between a team of researchers at the Australian National University and Chinese scholars. Having commenced in 2008, RUMiC's data collection program aims to build a panel dataset with rural–urban migrants as the target population. In China, the label "rural-urban migrants," specifically refers to those whose *hukou* (household registration) were registered in a rural area but were living in an urban area at the time of the survey. The Urban Migrant Survey covers 15 cities across nine provinces or metropolitan areas, namely Shanghai, Guangdong, Jiangsu, Zhejiang, Anhui, Hubei, Sichuan, Chongqing and Henan (see Map 1 for locations of surveying cities). The RUMiC team developed a sophisticated sampling scheme; and an unbiased, representative sample of 5,000 migrant households was selected randomly for face-to-face interviews in spring 2008.[3] The survey includes detail information about every family member living in the surveyed household, and it includes questions about individual characteristics, work, family expenditures and income, health, and social networks.

[Insert Map 1 About Here]

However, tracking rural-urban migrants has proven to be difficult especially during the economic recession.[4] Out of 5,000 households, only 1,821 respondent households participated in the follow-up survey in 2009. To compensate for the high attrition rate, the RUMiC survey

[3] For more details about RUMiC sample scheme, see http://rumici.anu.edu.au/ or Chapter 7 of "The Great Migration: Rural-Urban Migration in China and Indonesia."

[4] The high attrition rate could be a consequence of mass layoff as the global financial crisis takes a toll on the economy. According to a press conference held by the State Council Information Office of China on Feb 2, 2009, about 20 million migrant workers have returned home due to losing job.

team interviewed 3,422 new households in the spring of 2009.[5] Of the 5243 households surveyed in 2009, the RUMiC team successfully recruited 1,745 household heads (or their spouse) to participate in the experimental portion of the survey. Similar to most experiments involving subject recruitment, the findings from this experiment may be vulnerable to external validity issue.

Table 1 presents the summary statistics of the RUMiC 2009 sample. In parts of analysis, we use only the subsample who have participated in the experimental module, and the summary statistics of the subsample are presented in Column 1. Column 2 shows the summary statistics of those who are eligible, but did not participate in the experiment portion of the survey. Those who have participated in the experiment have fewer siblings, more educated, less likely to be self-employed and exhibit higher risk-tolerance in self-reported risk attitudes than their counterparts who have not participated in the experiment.

[Insert Table 1 About Here]

2.2 Risk and Time Preferences

RUMiC uses experiments to elicit individual's risk preference and time preference. The risk experiment uses real monetary payoff while the time preference experiment is with hypothetical payoff.[6] The script used in the experiment is presented in Appendix A. Each participant of the 2009 survey receives a call/text from RUMiC survey team. They are given a list of dates and times they can choose from to come to the lab. Subjects are told that they would receive 50 Yuan to compensate the transportation cost and the time they spend at the lab. The experimental module contains four parts in the following order—risk preference, time preference,

[5] The additional household included in the 2009 survey forms also an unbiased, representative sample.
[6] The hypothetical payoff for time preference experiment was determined because the setup of the experiment would involve subjects receiving money from the research institute in the future. Subjects' choice in the time experiment could also be dictated not only by her time preference but also by her trust of the research institute.

cognitive test and trust experiment. Subjects are shown a standardized video demonstrating how each part of experiments works. For the purpose of this paper, we will focus on the risk and time preference parts of the experiment.[7]

Table 2 Panel A illustrates the risk experiment's entire payoff matrix.

[Insert Table 2 About Here]

	A	B
1	**15 Yuan for Sure**	**If you throw 1、2、3, you win 20 Yuan** **If you throw 4、5、6，you win 0 Yuan**

The above figure demonstrates how Series 1, row 1 in Table 2 Panel A was presented to the subjects. It shows that lottery A (safe option) offers a 100% chance of receiving 15 Yuan (1USD ~6.77 Yuan). However, if one chooses lottery B (risky option), they would throw a die resulting in a 50% chance of receiving 20 Yuan and a 50% chance of receiving 0 Yuan. Each subject has to decide whether they prefer lottery A versus lottery B for each row within the series. In Series 1, lottery A does not change, but as we proceed down the matrix, the expected value of lottery B increases and eventually exceeds that of lottery A. Subjects are told one out of the 11 rows would be chosen randomly to play for real monetary payoff. We enforced monotonic switching, meaning that each subject was allowed to switch from lottery A to lottery B only once during each series.[8] The option of never switching (always choosing lottery A) or switching at row 1 (always choosing lottery B) were also available to all of the participants. In series 1, the more risk-averse individuals chose lottery A for a greater number of iterations before switching to lottery B. Throughout the later analysis, we are going to use this switching point 1 as a proxy for risk aversion. The advantage of using the switching point to represent one's risk attitudes

[7] The detail script and the preliminary results of trust game are available upon request.
[8] Holt and Laury (2002) use a similar choice-table procedure and they conclude that enforcing monotonic switching or not make little difference in individual choices.

rather than imputing a coefficient of risk aversion is that we do not need to make an assumption of the utility functional form. The imputation of coefficient is particularly sensitive to the functional form chosen. This nonparametric approach is also adopted by Dohmen et al (2010).

Figure 1 demonstrates the distribution of switching points of Series 1. As Figure 1 shows, there is a wide variation where participants switch from the safe option to risky option. About 70% of participants are risk averse, since they choose lottery B only after the expected payoff of the lottery B is greater than payoff of the safe option; about 20% of participants exhibit risk-loving attitude. This number is higher than what Liu (2010) finds in her Chinese farmers sample that 7% of farmers are risk loving. It is not surprising given that RUMiC sample is drawn from the migrant population, who are probably more risk loving than non-migrant population.

[Insert Figure 1 About Here]

Series 2 is designed to elicit individual time preference. Before proceeding with the analysis, it should be noted that empirically, few covariates have been found to predict individual time preference measured from the pair-wise experiments.[9] Pair-wise choices of Series 2 are also presented to subjects in the format similar to Series 1 (see Appendix for actual record sheet). Subjects are reminded that the time preference experiment is only a hypothetical experiment with no monetary payoff. The payoff matrix is in Table 2 Panel B. The choices the subjects are asked to make are between receiving 1000 Yuan in one month and receiving X Yuan in seven months. As the subject moves down the table, X would increase. For each row, the subject would have to make a choice, but again we enforce monotonic switching. Switching from A to B at the later rows would indicate that the subject has higher discount rate. Figure 2 depicts the histogram of Series 2 switching points. Although this experiment's payoff is only hypothetical, we still have a wide variation across switching points.

[9] see Frederick, Loewenstein & O'Donoghue for an excellent overview on the experimental literature on time-discounting.

[Insert Figure 2 About Here]

One unique aspect of the experimental module is that all subjects are asked to complete a 30-minute Raven's Standard Progressive Matrices (RSPM). RSPM is widely used as a measure of cognitive ability. The advantage of RSPM over other types of cognitive ability tests is that it consists of only 60 nonverbal questions. Given that some of our subjects are not ethnically Chinese and some had only received little or no formal education, the nonverbal aspect is particular important, so as to minimize the impact of language skills and cultural bias. (see Appendix B for sample questions). Figure 3 shows the resulting distribution of cognitive ability in our sample. It shows that the mean score is 39.9 and the median score is 42 (out of 60).

To ease the interpretation of our results, we use direct measures of the RSPM test scores in our analysis.[10] For risk and time experiments, we use the nonparametric measures, switching point of each series elicited from the experiment, instead of imputing discount rates and coefficients of risk aversion based on a chosen utility function form.

III. OLS and Probit Results

3.1 Willingness to Take Risk

[Insert Table 3 About Here]

We begin our analysis with the risk preference. We estimate the following regression model:

$$P_i^1 = \alpha N_i + \gamma S_i + X_i\beta + \varepsilon_i \qquad (1)$$

where P_i^1 the switching point in Series 1 for individual i. N_i is the number of siblings. S_i is size of social network. Xi is a vector of individual level controls—including hourly wage, wealth, gender, Table 3 Columns 1 to 3 show the relationship between switching point in Series 1 and

[10] One can also use the adjusted test score which is imputed based on the time subject takes to finish the test and the difficulty of the question that subjects answer correctly. For current version of the paper, we would only present the direct measure of test score.

various specifications. Having a higher switching point in risk experiment indicates more risk aversion. As for the main focus of the paper, we have two types of social network measures: one is the number of siblings, and the other one is friend-based social network, proxied by the number of people greeted/contacted/phoned during the last Chinese New Year subtracting the number of siblings. In Column 1, we use OLS regression with switching point 1 being the dependence variable and include only the most basic controls where the reverse causality problem is less severe, and we find that number of sibling is negatively correlated with risk aversion.[11] In Columns 2 and 3, we include a net wealth measure, which is proxied by the value of the durable goods owned and the value of the property owned in the city and subtract the total amount of debt. The negative coefficient on net wealth measure indicates that wealthier people are less risk averse. We have also tried to the natural log of the wealth proxies, but the results remain insignificant. Across all specifications, we find that females are more risk averse. Age also decreases one's willingness to take risk. Individuals who score higher on the cognitive ability test are willing to take on more risk. This confirms the findings of Dohmen et al (2010), Frederick (2006) and Benjamin et al. (2006). To the extent that we do not have a good measure of individual parental wealth, given that adult height is considered as a marker to reflect one's early environment, we also include height, but height appears to be not a good predictor of risk preference (regression result not reported in Table 3). Most interestingly, we find that having more siblings is negatively correlated with risk aversion while the friend-based social network does not seem to be correlated with risk preference.

[11] Since our dependent variable is not a continuous variable, we had also used order probit model and the main results are robust. We report the OLS regression result since we will be performing IV later in the analysis. The results would be more easily comparable.

In Column 3, we allow the coefficients to be differed by gender; therefore, interaction terms between female and covariates are included. [12] We find that there is little difference between the coefficients on number of sibling between men and women. On the other hand, women's risk taking behaviors are particularly affected by the size of their friend-based social network, whereas this relationship does not exist among men. We can only make conjecture as to why friendship should affect women more than men in willingness to take risk. One possibility is that given the son preference persist in Chinese culture, therefore, the majority part of bequests would be left to sons instead of daughters, thus, female need to rely on friend-based social network more than male. Those females with more friends are more likely to take risk. Another possibility that we cannot rule out is that a third factor is correlated with the number of friends and risk taking behavior only among women, but not men.

3.2 Time Preference

In Table 3 Column 4 to 6, we present the analysis with discount rate, proxied by switching point in Series 2, being the dependent variable. Those with a higher discount rate should switch later in the time preference experiment. Across specification, the only measure that is robust and significant is that women behave more impatiently in the experiment. We also find that wealth is negatively associated with discount rate—thus the wealthier individuals have lower discount rates. Given that we find little predictability in discount rates, for the rest of the paper, we would focus on risk-taking behaviors.

3.3 Self-Employment/Moving Out of Home Provinces

[12] An F-test has been performed to test whether all female interaction term and female dummy are jointly equals to zero and we reject the null hypothesis at the 1% significance level.

While we find that family size is positively correlated with one's willingness to take risk in the lab experiment, it is unclear whether family size would be able to predict the real-world risk taking behaviors. In the survey, we have three measures of how much risk does one take in real-world. First, we have information on whether one is self employed. We also know whether they are self-employed because they cannot find a job or not. While self-employment can possibly be undesirable in other parts of the world, in China being self-employed is associated with higher monthly income (Frijters and Meng, 2010). In this part of analysis, we use a probit model where being self-employed is a dependent variable. The coefficients from the probit model are presented in Table 4 Columns 1 to 3. Across specifications, what we find is that having more siblings is positively correlated with becoming self-employed. This relationship does not differ between men and women. On the other hand, the size of friend-based social network is uncorrelated with self-employment. The correlation between self-employed and family size could be due to factors other than risk attitudes. For example, in our survey, we find that nearly half of the sample had considered being self-employed, but among those, 52 percent citing not being able to borrow enough money as the main reason stopping them to start their business.

[Insert Table 4 About Here]

In Columns 4 to 6, the dependent variable is a dummy variable indicating whether one staying at their home province or not. We find that the coefficient on number of siblings is negative but insignificant. In Columns 7 to 9, a continuous variable, measuring the distance from one's home in rural area to the city one currently resides, is the dependent variable. To prevent that the results are driven by a few outliers, we use the natural log of distance measured as the dependent variable. The results show that having more siblings is positively associated with

moving farther away from home. In Column 4 to Column 9, the coefficient on social network is insignificant.

[Insert Table 5 About Here]

For this part of analysis, we also try to replicate using the full sample, and the results are presented in Table 5. Unfortunately, in the full sample, we do not have distance from home to current residence estimated for all individuals yet, therefore, we can only replicate the results for self-employment and staying in one's home province. We find that the main coefficient of interest, the number of siblings, are significant and have the expected sign across specifications in the full sample.

[Insert Table 6 About Here]

In Table 6, we further explore the possible differential impact of older and younger siblings. For every participant, we have information on their birth order and can impute the number of older sibling and younger siblings each one has. Similar to the specification in Table 5, we conduct the regression analysis but we substitute total number of siblings by the number of older and younger siblings. In Table 6, the dependent variable in each regression is listed on the top of the column. We find that having older siblings is associated with more risk-taking behavior in the lab experiment and more likely to move far from home. Having more siblings is positively correlated with being self-employed—the effect is bigger with the number of younger sibling. Overall, in this table, we find that those with more older siblings are more likely to take more risk in the experiment and start their own business and move far from home and this relationship does not really differ by gender.

IV. Instrumental Variable

The instrument we use is the implementation and the enforcement of one-child policy in China. Although the one-child policy was ostensibly carried out on a nationwide scale in 1979, the enforcement of the policy is differed at the local level. For example, an exemption rule, which allows rural couples to have two children, is only implemented in parts of the country.[13] Gu, Wang, Guo & Zhang (2007) survey the relaxation of one-child policy in the 1990s and estimate fertility levels that would obtain locally if all married couples had births at the levels permitted by local policy at the prefecture level. [14] This imputed fertility level captures the quantitative difference of one child policy at the prefecture level. We then match it with our subjects' *hukuo* (household registration) at the prefecture level. These one-child policy instruments, measured at the migrants' home prefecture in the 1990s, influence one's sibling size, and they are unlikely to be contemporaneously correlated with how one behaves in the lab, or become self-employed in the city, or the distance migrants have moved from home. It is reasonable to assume that the one child policy may have differential impact on sibling size depending on the decade one was born. Therefore, we include a series of interaction term between the decade of birth and the local one-child policy measure as instruments. The first stage result is presented in Table 7. These IVs are jointly significant at the 1% level for all of cases. Table 8 presents the second stage result. Table 8 Column 2 shows that the number of sibling has a positive and significant effect (at 1% level) on being self-employed and number of sibling has a negative and significant effect on staying in one's home province. Our key result (other than the lab result) is robust to the IV estimation.

In a regression result not reported, we also find that our sets of one child policy IV only more impact on the number of younger siblings, but not the number of older siblings. Therefore,

[13] A paper by Edlund, Li, Yi & Zhang (2007) use the variation of one child policy at the provincial level over time as an instrumental variable for sex ratio, however, the dataset is currently unavailable for public use.
[14] Prefecture is one administrative level below the province. There are a total of 420 prefecture-level in China.

in Table 9, we present IV regression results, where the number of younger sibling is instrumented. In this set of regressions, as before, our regression result is robust. We find that having more older and younger siblings would both lead to higher probability of being self-employed, as well as moving farther away from home.

Discussion

There is an extensive theoretical and empirical literature that investigates the effect of child quantity and quality trade-off (see Black, Devereux & Salvanes). This paper does not speak to the quality of children directly, however, it can contribute to that literature by understand the channel through which the quantity of children can possibly dictate differential earnings when they become adult.

This paper intends to explore the effect of size of social network on individual risk-taking behavior and time preference. We find that in the case of Chinese migrant workers, having more siblings is positively associated with more risk taking behaviors, not only in the lab environment, but also including starting one's own business and leaving one's home province. On the other hand, friend-based social network seem to have little or no effect on one's risk-taking behaviors. Our results remain robust when we use instrument controlling for size of siblings. Our result also suggests that the implementation of one child policy may bring us a new generation of more risk-averse cohort. Given that being risk-seeking and self-employed are both associated with higher monthly salary in China, one child policy could possibly hinder Chinese economic growth.

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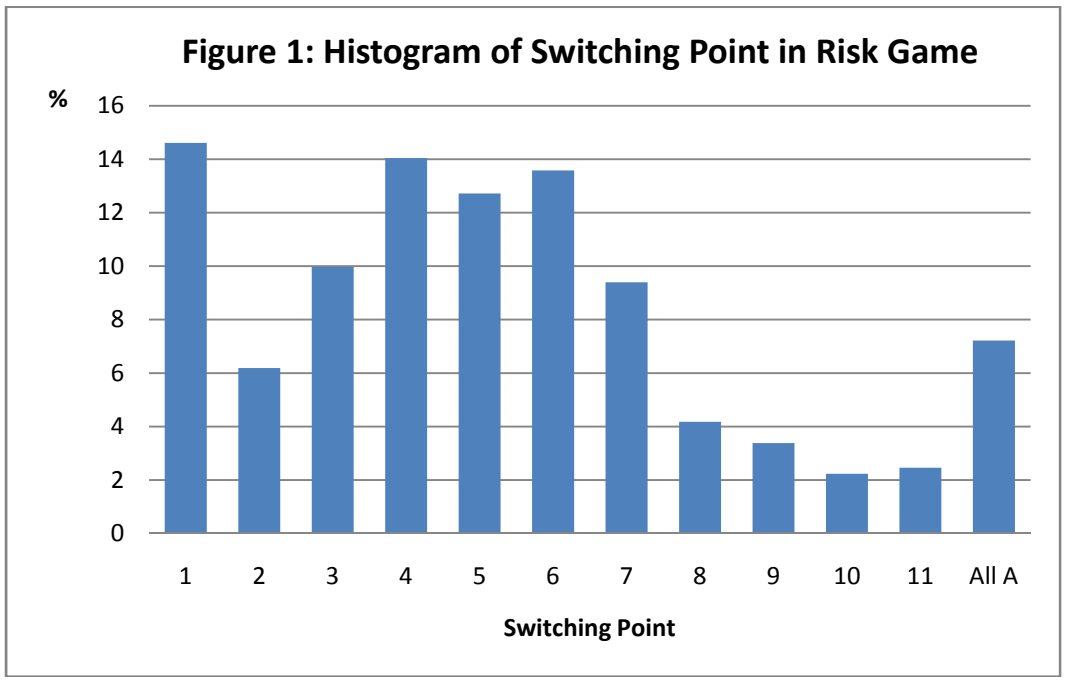
Figure 1: Histogram of Switching Point in Risk Game
%
16
14
12
10
8
6
4
2
0
1
2
3
4
5
6
7
8
9
10
11
All A
Switching Point

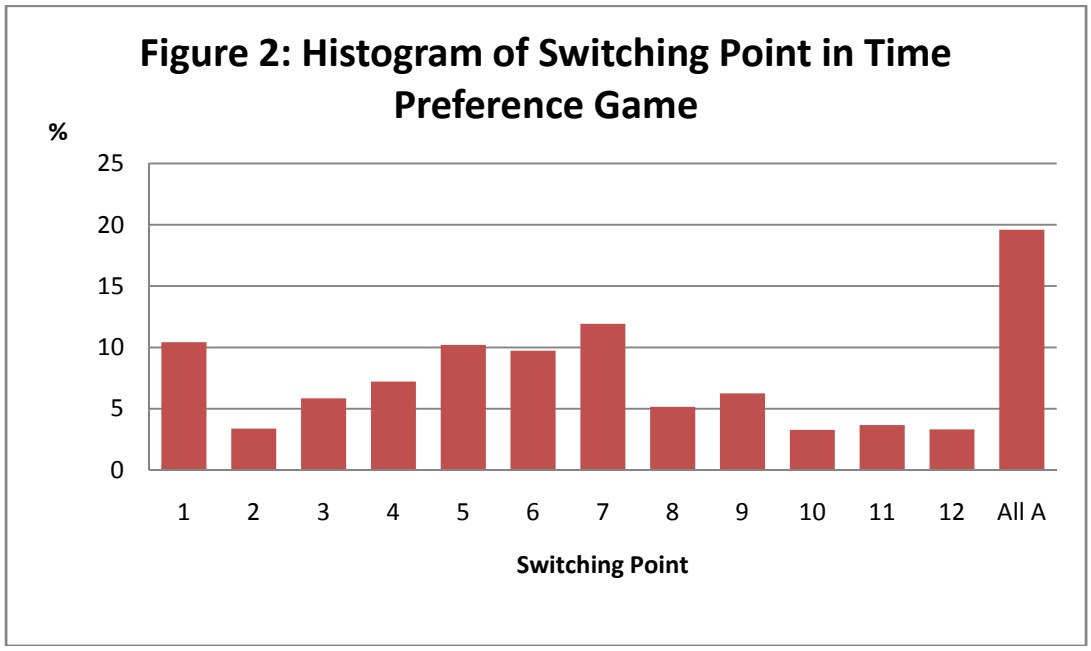
Figure 2: Histogram of Switching Point in Time Preference Game
%
25
20
15
10
5
0
1
2
3
4
5
6
7
8
9
10
11
12
All A
Switching Point

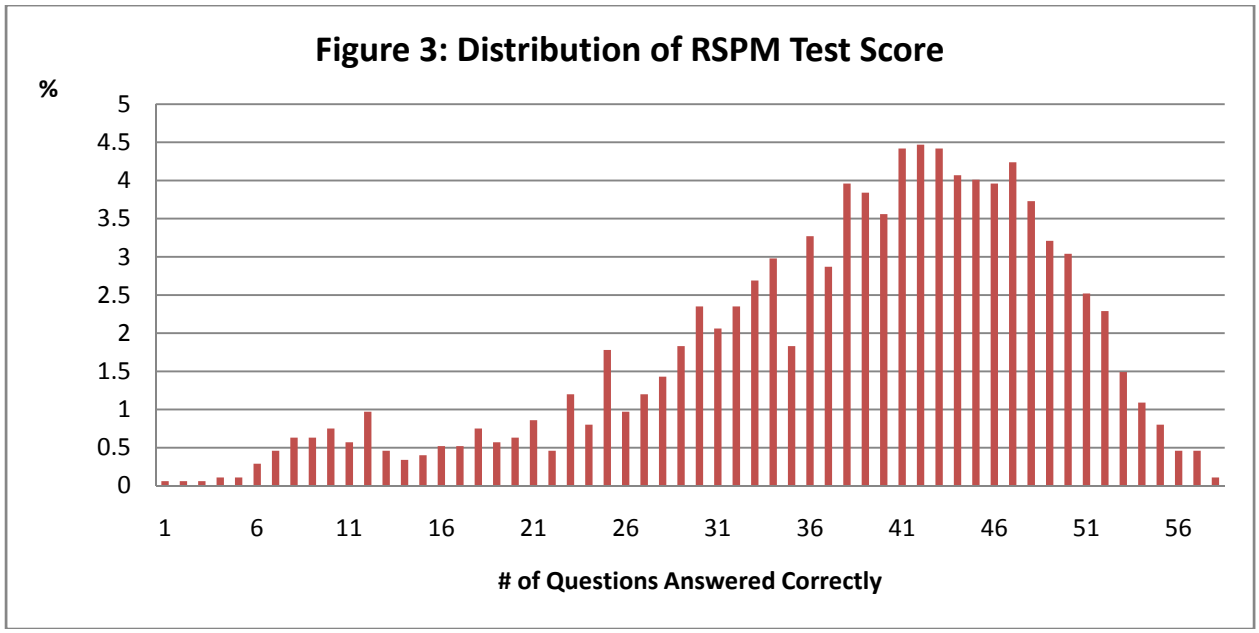
Figure 3: Distribution of RSPM Test Score
%
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
1
6
11
16
21
26
31
36
41
46
51
56
# of Questions Answered Correctly

Table 1: Summary Statistics of Head of Households in 2009 Survey

	Experiment Participants	Non Expermental Participants
Female	0.35	0.33
	(0.48)	(0.47)
Age	31.06	31.97
	(9.84)	(10.71)
Raw IQ Score (out of 60)	39.90	--
	(11.17)	
Non Han Ethnicity	0.02	0.02
	(0.13)	(0.15)
Currently Married	0.55	0.57
	(0.50)	(0.50)
Size of Social network[a] (persons)	23.4	24.32
	(25.7)	(25.77)
Number of Siblings	2.10	2.28*
	(1.61)	(1.65)
Education (year)	9.68	9.32*
	(2.60)	(2.50)
Hourly Wage (Yuan)	7.30	7.92
	(5.14)	(33.6)
Wealth Per Capita (yuan)	6840.70	6391.53
	(40,036)	(33,681)
Self-Employed	0.21	0.23*
	(0.40)	(0.42)
% Staying at the Home Province	0.64	0.53*
	(0.48)	(0.50)
General Risk Taking Measures	4.36	4.13*
(1=risk averse..10 =risk loving)	(2.57)	(2.66)
Height (meter)	1.66	1.66
	(0.07)	(0.07)
Observations	1744	3481

Note: Standard Deviations are presented in parentheses.
* indicates whether the samples are statistically different at 5 % level
a. size of social network represents the number of people the subject had contacted during Chinese New Year in 2009.

Table 2: Payoff Matrix from the Experiment

Panel A: Risk experiment

Series 1	Option A	Option B
1	100% winning 15 Yuan	50% of winning 20 Yuan and 50% of winning 0 Yuan
2	100% winning 15 Yuan	50% of winning 25 Yuan and 50% of winning 0 Yuan
3	100% winning 15 Yuan	50% of winning 30 Yuan and 50% of winning 0 Yuan
4	100% winning 15 Yuan	50% of winning 35 Yuan and 50% of winning 0 Yuan
5	100% winning 15 Yuan	50% of winning 40 Yuan and 50% of winning 0 Yuan
6	100% winning 15 Yuan	50% of winning 45 Yuan and 50% of winning 0 Yuan
7	100% winning 15 Yuan	50% of winning 50 Yuan and 50% of winning 0 Yuan
8	100% winning 15 Yuan	50% of winning 55 Yuan and 50% of winning 0 Yuan
9	100% winning 15 Yuan	50% of winning 60 Yuan and 50% of winning 0 Yuan
10	100% winning 15 Yuan	50% of winning 65 Yuan and 50% of winning 0 Yuan
11	100% winning 15 Yuan	50% of winning 70 Yuan and 50% of winning 0 Yuan

Panel B: Patience experiment

Series 2	Option A	Option B
1	Receiving 1000 Yuan in 1 month	Receiving 1025 Yuan in 7 months
2	Receiving 1000 Yuan in 1 month	Receiving 1075 Yuan in 7 months
3	Receiving 1000 Yuan in 1 month	Receiving 1125 Yuan in 7 months
4	Receiving 1000 Yuan in 1 month	Receiving 1175 Yuan in 7 months
5	Receiving 1000 Yuan in 1 month	Receiving 1225 Yuan in 7 months
6	Receiving 1000 Yuan in 1 month	Receiving 1275 Yuan in 7 months
7	Receiving 1000 Yuan in 1 month	Receiving 1325 Yuan in 7 months
8	Receiving 1000 Yuan in 1 month	Receiving 1375 Yuan in 7 months
9	Receiving 1000 Yuan in 1 month	Receiving 1425 Yuan in 7 months
10	Receiving 1000 Yuan in 1 month	Receiving 1475 Yuan in 7 months
11	Receiving 1000 Yuan in 1 month	Receiving 1525 Yuan in 7 months
12	Receiving 1000 Yuan in 1 month	Receiving 1575 Yuan in 7 months

Table 3: Determinants of Individual Risk and Time Preferences

Dependent Variable	Switch Point 1: Risk Aversion (the higher the more risk averse)			Switch Point 2: Time Preference (the higher the more impatient)		
	(1)	(2)	(3)	(4)	(5)	(6)
female	0.767	0.739	3.694	**0.141**	**0.139**	**2.912**
	(0.174)***	(0.178)***	(1.270)***	**(0.189)**	**(0.192)**	**(1.566)***
age	0.041	0.037	0.048	-0.009	-0.009	0.004
	(0.010)***	(0.012)***	(0.014)***	(0.011)	(0.012)	(0.015)
Num of Sibling	**-0.149**	**-0.15**	**-0.161**	0.002	0.004	-0.054
	(0.057)* **	**(0.060)** **	**(0.069)** **	(0.068)	(0.070)	(0.088)
female* numsib			**0.057**			0.208
			(0.122)			(0.155)
Raw IQ Score	-0.022	-0.021	-0.008	-0.015	-0.014	-0.01
	(0.009)**	(0.009)**	(0.011)	(0.010)	(0.010)	(0.013)
Non Han	0.209	0.21	0.605	0.759	0.786	1.042
	(0.580)	(0.577)	(0.635)	(0.680)	(0.672)	(0.791)
Married		0.121	0.245		-0.051	-0.091
		(0.204)	(0.240)		(0.241)	(0.322)
Social network[a] (in 100 persons)		-0.012	0.407		-0.158	-0.4
		(0.294)	(0.363)		(0.399)	(0.506)
Education (year)		0.015	0.003		-0.002	0.053
		(0.033)	(0.042)		(0.045)	(0.053)
Hourly Wage		-0.021	-0.021		-0.003	0.013
		(0.015)	(0.016)		(0.020)	(0.024)
Net Asset (Wealth-Debt)		-1.139	-1.607		**-2.792**	**-3.925**
Per Capita		(1.516)	(0.900)*		**(1.686)***	**(1.517)** **
female*age			-0.041			-0.044
			(0.025)			(0.034)
female*yedu			0.023			-0.137
			(0.072)			(0.081)*
female*marry			-0.394			0.145
			(0.397)			(0.514)
female*network			**-1.603**			0.682
			(0.636) **			(0.778)

female*hourly wage			-0.004			-0.047
			(0.029)			(0.039)
female*iq score			**-0.036**			-0.009
			(0.017)**			(0.023)
female*nonhan			-1.672			-0.736
			(1.222)			(1.658)
female*net asset			3.839			**7.1**
			(3.781)			**(4.230)***
Observation	1744	1742	1742	1744	1742	1742
R-squared	0.04	0.04	0.05	0	0.01	0.02

Note: Standard errors clustered at the game-group level. * significant at 10%; ** significant at 5%; *** significant at 1%
In Columns 3 and 6, we perform an F-test to check whether all female interaction terms are jointly significant or not and we reject the null that they are equals to zero at 5 percent level.
a. Size of social network is measured by the number of people (in 100) one has contacted during last Chinese New Year subtracting the number of siblings

Table 4: Probit Model of Self-Employment & Staying at the Home Province

	Self-Employment			Staying in the Home Province			Distance		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
female	0.105	0.092	-0.429	0.301	0.245	-0.7	-0.36	-0.305	0.364
	(0.098)	(0.090)	(0.339)	(0.131)**	(0.140)*	(0.571)	(0.127)**	(0.124)**	(0.563)
age	0.035	0.014	0.01	0.006	0.007	0.002	-0.009	-0.006	-0.003
	(0.007)***	(0.006)**	(0.007)	(0.005)	(0.006)	(0.007)	(0.006)	(0.007)	(0.006)
Num of Siblings	**0.096**	**0.054**	**0.059**	**-0.043**	**-0.057**	**-0.062**	**0.03**	**0.053**	**0.069**
	(0.030)* **	**(0.026)** **	**(0.033)***	**(0.044)**	**(0.042)**	**(0.050)**	**(0.031)**	**(0.028)***	**(0.032)***
Female* numsib			**-0.03**			**0.022**			**-0.041**
			(0.059)			**(0.060)**			**(0.066)**
Raw IQ Score	0.000	0.005	0.000	0.005	0.006	0.002	0	-0.004	0
	(0.003)	(0.003)	(0.004)	(0.006)	(0.005)	(0.006)	(0.005)	(0.004)	(0.006)
Non Han	0.156	0.067	-0.139	-0.538	-0.567	-0.928	0.751	0.737	0.915
	(0.226)	(0.240)	(0.367)	(0.263)**	(0.245)**	(0.309)***	(0.277)**	(0.267)**	(0.278)***
Married		0.833	0.896		0.006	0.094		-0.09	-0.169
		(0.184)***	(0.212)***		(0.103)	(0.112)		(0.098)	(0.127)
Social network[a]		0.073	0.178		0.226	0.152	-0.349	-0.398	-0.35
(in 100 persons)		(0.173)	(0.218)		(0.229)	(0.234)	(0.271)	(0.239)	(0.220)
Education (year)		-0.073	-0.052		0.007	0.003		0.029	0.035
		(0.017)***	(0.021)**		(0.022)	(0.028)		(0.022)	(0.025)
Hourly Wage		-0.001	-0.014		(0.053)	(0.054)		0.046	0.042
		-0.013	(0.013)		(0.016)***	(0.017)***		(0.014)***	(0.012)***
Net Asset Per Capita		1.619	1.239		4.032	4.863		-1.303	-1.157
		(1.113)	(0.939)		(1.294)***	(2.220)**		(0.391)***	(0.320)***
female*age			0.014			0.014			-0.009
			(0.011)			(0.010)			(0.013)
female*yedu			-0.071			0.011			-0.015
			(0.035)**			(0.035)			(0.021)
female*marry			-0.226			-0.241			0.226
			(0.216)			(0.184)			(0.181)
female*network			-0.473			0.332			-0.171

			(0.365)			(0.398)			(0.295)
female*iq score			0.017			0.01			-0.009
			(0.008)**			(0.007)			(0.007)
female*nonhan			0.619			1.688			-0.817
			(0.554)			(0.610)***			(0.457)*
female* hourly wage			0.041			0.001			0.012
			(0.017)**			(0.018)			(0.023)
female*net asset			3.513			-1.956			-0.841
			(1.913)*			(2.734)			(1.852)
Observation	1708	1703	1703	1742	1742	1742	1742	1742	1742

Note: Standard errors clustered at the game-group level. * significant at 10%; ** significant at 5%; *** significant at 1%

a. Size of social network is measured by the number of people (in 100) one has contacted during Chinese New Year subtracting the number of siblings

Results reported in Columns 7-9 are from OLS regression where natural log of distance between city one currently reside and home town is the dependent variable.

Table 5: Probit Model of Self-Employment & Staying at the Same Province

	Full Sample			
	Self-Employment		**Staying in the Home Province**	
	(1)	(2)	(3)	(4)
female	0.095**	-0.021	0.128	-0.055
	[0.039]	[0.216]	[0.051]**	[0.254]
age	0.004	0.001	0.015	0.013
	[0.003]	[0.004]	[0.005]***	[0.005]**
Num of Sibling[C]	0.036**	0.040*	-0.051	-0.063
	[0.016]	[0.022]	[0.029]*	[0.030]**
female* numsib		-0.012		0.028
		[0.023]		[0.021]
Non Han	-0.182	-0.129	-0.604	-0.665
	[0.177]	[0.183]	[0.205]***	[0.196]***
Married	0.948***	0.946***	0.027	0.122
	[0.085]	[0.090]	[0.076]	[0.087]
Social network[a]	0.089	0.072	0.306	0.182
(in 100 persons)	[0.103]	[0.105]	[0.142]**	[0.142]
Education (year)	-0.073***	-0.060***	0.016	0.006
	[0.012]	[0.016]	[0.017]	[0.020]
Hourly Wage	0.008*	0.005*	-0.015	-0.011
	[0.004]	[0.003]	[0.006]***	[0.005]**
Net Asset Per Capita	1.366**	1.663**	1.48	2.205
	[0.577]	[0.700]	[1.235]	[1.409]
female*age		0.009**		0.005
		[0.004]		[0.005]
female*yedu		-0.031*		0.027
		[0.018]		[0.020]
female*marry		0.001		-0.242
		[0.088]		[0.068]***
female*network		0.045		0.374
		[0.136]		[0.116]***
female*nonhan		-0.156		0.224
		[0.254]		[0.194]
female* hourly wage		0.015**		-0.027
		[0.007]		[0.007]***
female*net asset		-0.590		-1.361
		[0.874]		[0.724]*
Observation	7173	7173	7173	7173

Note: Standard errors clustered at the city level. * significant at 10%; ** significant at 5%; *** significant at 1%. The full sample includes all household heads and their spouse.

a. Size of social network is measured by the number of people (in 100) one has contacted during Chinese New Year subtracting the number of siblings.

Table 6: Effect of Sibling Composition on Behaviors

	Subsample								Full Sample	
Dependent Variable	Switching Point 1	Self Employed	Staying in the Home Province	Ln (Distance)	Switching Point 1	Self Employed	Staying in the Home Province	Ln (Distance)	Self Employed	Staying in the Home Province
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Female	0.691	0.061	0.268	-0.342	2.801	-0.243	-0.998	0.311	0.467	0.051
	(0.194)***	(0.099)	(0.159)*	(0.135)**	(1.488)*	(0.347)	(0.600)*	(0.527)	[0.262]*	[0.310]
# Older Siblings	-0.159	0.032	-0.051	0.076	-0.209	0.058	-0.061	0.072	0.046	-0.034
	(0.070)**	(0.032)	(0.033)	(0.026)**	(0.076)***	(0.040)	(0.044)	(0.035)*	[0.021]**	[0.026]
# Younger Siblings	-0.154	0.117	-0.021	0.005	-0.108	0.096	-0.022	0.024	0.041	-0.064
	(0.083)*	(0.031)***	(0.058)	(0.038)	(0.093)	(0.048)**	(0.070)	(0.049)	[0.025]	[0.046]
Female *					0.199	-0.098	0.038	0.004	-0.026	0.009
# older sib					(0.150)	(0.070)	(0.054)	(0.064)	[0.031]	[0.028]
Female *					-0.117	0.08	0.017	-0.082	-0.003	0.066
# younger sib					(0.179)	(0.093)	(0.076)	(0.111)	[0.044]	[0.036]*
Size of	0.161	0.122	0.267	-0.474	0.582	0.246	0.201	-0.413	0.121	0.338
Social Network	(0.304)	(0.175)	(0.227)	(0.238)*	(0.384)	(0.221)	(0.239)	(0.250)	[0.105]	[0.175]*
Female *					-1.437	-0.567	0.292	-0.193	-0.087	0.219
Social Network					(0.694)**	(0.377)	(0.392)	(0.286)	[0.121]	[0.153]
Observations	1521	1482	1521	1505	1521	1521	1482	1505	5163	5306
R-squared	0.04			0.07	0.06			0.06		

Note: Standard errors clustered at either game-group level or city level. * significant at 10%; ** significant at 5%; *** significant at 1%

Columns 1, 4-5 and 8 are OLS Regression. Columns 2, 3, 6, 7 and 9-10 use Probit model. All regression includes other covariates such as married network, age, non han, wealth and female interaction terms.

Table 7: First Stage Regressions of the IV-Estimations

	Dependent Variable				
	Number of Sibling	Number of Sibling	Female * Number of Siblings	Number of Younger Sib	Female * Number of Younger Sib
Instrumental Variable	(1)	(2)	(3)	(4)	(5)
One Child Policy (OCP)	0.576	1.108		0.54	
	(0.240)**	(0.186)***		(0.199)**	
Female * OCP			0.816		0.397
			(0.211)***		(0.187)*
OCP * Decade of Birth Dummies	X	X		X	
Female * OCP * Decade of Birth Dummies			X		X
Control Variables					
Female		0.012	0.114	0.194	0.307
		(0.087)	(0.240)	(0.058)***	(0.190)
Married		0.367	0.102	0.143	0.039
		(0.086)***	(0.063)	(0.065)**	(0.039)
Size of Social Network		-0.118	0.051	-0.007	0.07
		(0.131)	(0.054)	(0.103)	(0.066)
Age		0.055	-0.008	0.011	0.002
		(0.024)**	(0.003)**	(0.020)	(0.002)
Father Alive		-0.373	-0.123	0.326	0.122
		(0.091)***	(0.058)*	(0.068)***	(0.038)***
Mother Alive		0.149	(0.084)	0.414	0.026
		(0.182)	(0.074)	(0.152)**	(0.081)
Year of Education		-0.067	-0.034	0.001	-0.002
		(0.022)***	(0.012)**	-0.012	(0.007)
Hourly Wage		-0.007	-0.002	-0.007	-0.004
		(0.005)	(0.003)	(0.003)**	(0.003)
IQ Score		0.002	0.001	-0.002	-0.001
		(0.004)	(0.002)	(0.003)	(0.002)
Non Han		0.216	-0.128	0.169	-0.135
		(0.328)	(0.045)**	(0.379)	(0.069)*
Net Asset per Capita		-0.456	-0.144	-0.213	-0.11
		(0.548)	(0.435)	(0.659)	(0.309)
Joint F Test of IVs					
F-Statistics	162.08	11.680	295.470	158.590	107.970
p-values	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Observations	1745	1742	1742	1521	1521
R-squared	0.3	0.34	0.69	0.2	0.51

* significant at 10%; ** significant at 5%; *** significant at 1%

Table 8: IV 2SLS Estimation of Effect of Num of Sib on Risk Taking Behaviors

Dependent Variable	Switching Point 1	Self Employed	Staying in the Home Province	Ln (Distance)	Switching Point 1	Ln (Distance)
	(1)	(2)	(3)	(4)	(5)	(6)
Female	0.794	0.061	0.157	-0.321	4.255	0.265
	(0.186)***	(0.100)	(0.103)	(0.122)**	(1.372)***	(0.626)
Num of Siblings	-0.03	0.438	-0.628	0.356	0.152	0.342
	(0.214)	(0.103)***	(0.127)***	(0.246)	(0.273)	(0.127)***
Female * Num of Sib					-0.558	-0.027
					(0.428)	(0.194)
Size of Social Network	-0.005	0.086	0.11	-0.376	0.456	-0.315
	(0.297)	(0.175)	(0.146)	(0.241)	(0.359)	(0.169)*
Female * Social Network					-1.588	-0.296
					(0.651)**	(0.450)
Observations	1742	1703	1742	1722	1742	1722
R-squared	0.04				0.04	

Note: Standard errors clustered at the game-group level. * significant at 10%; ** significant at 5%; *** significant at 1%
Columns 1 and 4-6 are OLS Regression with instrumental variables. Column 2 and 3 are probit model with instrumental variables. We also tried to replicate 2 and 3 with female interaction terms, but the MLEs do not converge. All regression specification include covariates such as married, non Han, age, year of education, hourly wage, wealth and female interaction terms.