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"Entrepreneurs Under Uncertainty:

An Economic Field Experiment"

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Entrepreneurs under Uncertainty: An Economic Field Experiment

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Abstract: We investigate whether entrepreneurs differ from other people in their willingness to expose themselves to various forms of uncertainty in experimental decision tasks. A stratified random sample of 700 established entrepreneurs from the Yangzi delta region in China is compared to 200 control group members. Our findings suggest that entrepreneurs' are not generally more willing to accept situations involving uncertainty. Notwithstanding, they seem to be more willing to accept some forms of strategic uncertainty related to multilateral competition and trust.

Key words: Entrepreneurship, Risk, Ambiguity, Willingness to Compete, Trust.

JEL codes: C93; D21; L21.

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1. Introduction

Entrepreneurial activities are at the core of economic development and wealth creation in free market economies (Baumol 1990). Even so, neoclassical economics has largely neglected research on entrepreneurship. Interest in understanding entrepreneurial behavior has only recently developed, thereby shifting attention from a relatively broad interest in studying pro-growth business environments to the equally important question, what actually makes an entrepreneur. As entrepreneurial activity characteristically involves decision-making under conditions of uncertainty (Say, 1803, Knight, 1921, Kirzner 1973, Kihlstrom and Laffont 1979), it has been commonly assumed that entrepreneurs may differ from ordinary people in their willingness and ability to make decisions despite uncertainty. Yet empirical evidence is still scattered and inconclusive.

Our point of departure is the observation that uncertainty has multiple dimensions, which makes it perfectly conceivable that entrepreneurs may differ from other people in some but not all respects. Since all such empirical studies necessarily involve some idiosyncrasies (in terms of sampling, research method, etc.), cumulative evidence does not allow for robust inferences as to whether and how entrepreneurial behavior differs from that of ordinary people. To get a more nuanced picture and to take research a step forward we shift to a multi-dimensional analysis of economic behavior under uncertainty.

For our analysis, we have chosen to focus on standard risk and ambiguity, which represent non-strategic forms of uncertainty salient in entrepreneurial decision-making, and on competition (where the uncertainty concerns the individual's performance relative to others), and trust (where there is a "social" risk that another party does not act favorably toward the trustee),

which exemplify situations involving strategic forms of uncertainty. Instead of using hypothetical or self-descriptive responses, we exploit well-established methods from experimental economics, namely the multiple price list method (see Binswanger, 1980, Holt and Laury, 2002, Andersson et al., 2006) to study real entrepreneurs in controlled incentivized behavioral tasks.¹ A distinct advantage of our study is the large sample size and randomized selection of participants drawn from a natural setting, with 700 entrepreneurs from a stratified random sample of about 2800 private firms located in China's Yangzi delta region, which is a center of capitalist economic development. The overall response rate was 25 percent, which is generally perceived as an acceptable result for studies targeting CEOs and top managers.² A representative sample of 200 persons matching the key demographic features of the sample of entrepreneurs serves as control group.

Our study yields two significant findings: First, differences between entrepreneurs and other people are only of moderate magnitude. Second, underscoring the importance of a multi-dimensional design, no difference between entrepreneurs and ordinary people is observed for cases of standard risk and ambiguity, whereas in experimental tasks involving strategic components—competition or trust—we find that entrepreneurs display a higher level of uncertainty tolerance. They are more willing to accept uncertainty related to multilateral competition than others. Moreover, they are significantly more willing to trust another anonymous person than are participants of the control group. Through our multi-dimensional

¹ Harrison and List (2004) use the term “artefactual” field experiments to describe experiments (like this one), which expose uncommon subject categories to experimental procedures normally used in the economic laboratory.

² Based on a survey including 175 different studies published in the years 1975, 1985, and 1995 in top-tier academic journals in management and behavioral studies, Baruch (1999) identifies a norm value of 35.5 percent+ /-13.3 for studies involving top management, whereas mean values in non-western societies tend to be even lower.

experimental design, we can exclude that this greater willingness to trust strangers is driven by differences in risk-aversion. These results do not suggest a simple “yes” or “no” when it comes to the question whether entrepreneurs are more willing to accept uncertainty than others. Instead our research suggests that entrepreneurs show a greater ability to cope with certain forms of uncertainty involving strategic risk.

In section 2, drawing on the entrepreneurship literature, we discuss these different dimensions of uncertainty that are important in entrepreneurial decision-making, and we generate our working hypotheses. Section 3 lays out the research strategy and the experimental design. In section 4, we summarize our results and section 5 concludes.

2. Theory, Hypotheses and Earlier Research

To represent non-strategic forms of uncertainty, we focus on risk and ambiguity. Risk involves situations in which the decision-maker has information about the probability of different outcomes and can choose between different alternatives. According to neo-classical utility theory such decisions are affected by the curvature of the individual’s utility function for money. Ambiguity, in turn, we define in line with Ellsberg (1961) as involving situations where economic actors have information about conceivable outcomes, but not about their probabilities.

The characteristic feature of strategic forms of uncertainty is that the outcome of decision-making is contingent upon other individuals’ actions. Here we focus on competition and trust. With both, beliefs about these other people are likely to influence individual decisions. To assess tolerance for uncertainty stemming from competition, we ask the participant to choose between a

competitive situation and a non-competitive one. Clearly, the choice will depend on the decision-maker's beliefs about his or her own performance relative to others and also to some extent on her preference for competition *per se*. To assess trust, we let participants choose between delegating a distribution task to another person – whom they have not met - and letting the distribution to be determined by a random device. Obviously, decisions will reflect a decision maker's beliefs about the other person's willingness to act favorably in the distribution task.

2.1 Risk

Kihlstrom and Laffont (1979) build on pioneering work by Knight (1920) to incorporate the entrepreneur into a general competitive equilibrium framework. In their model, economic agents can choose between supplying their labor on the labor market to secure relatively risk-free wage employment, or becoming an entrepreneur facing risky income prospects. In the equilibrium, less risk-averse agents become entrepreneurs and more risk-averse agents become wage-earners. From this theory, we derive our first hypothesis, which we state in a form to allow for two-sided tests.³

H1A: Entrepreneurs differ from others with respect to risk-taking.

To test H1A we let subjects choose between two risky lotteries where one is more risky than the other.

³ Although the crucial assumption in Kihlstrom and Laffont (1979) implies a direction of the difference in risk-taking, we prefer to keep our hypotheses open to allow for two-sided tests. The reason for this is that the intention of this paper is not to test isolated theories. Rather, the theories are used to motivate the investigation of different forms of uncertainty without unnecessary restrictions.

Prospect theory suggests that people use weighting functions instead of probabilities when choosing between different alternatives (see Kahneman and Tversky, 1979). Except for certain outcomes (with probability one), actors underweigh outcomes not obtained with certainty. This phenomenon—denoted as “subcertainty” or as “certainty effect”—explains risk aversion in choices involving sure gains and drives results like the Allais paradox, where actual choices collide with predictions based on utility theory (Allais, 1953). Since it is plausible that entrepreneurs differ from others in their certainty preference, we compare entrepreneurs with ordinary people when choosing between a certain and a risky alternative (where weights do not sum to one). Potentially, this allows us to separate between differences relating to the shape of the so-called “value function” and differences with respect to the “weighting function.”⁴ Thus we specify the following hypothesis:

H1B: When facing a risky alternative, the entrepreneurs have a different preference for guaranteed outcomes compared to ordinary people.

Empirical evidence on entrepreneurial risk taking behavior is surprisingly inconclusive, given the central role of risk-taking in entrepreneurship theories. Shane (see e.g., p. 103-105, 2003), for instance, concludes that the empirical evidence suggests that entrepreneurs are more risk-taking, while Wu and Knott (2006: p. 1315) summarize that “To date, however, the empirical record indicates that entrepreneurs’ risk profiles are indistinguishable from those of

⁴ In addition, it can be noted that this is the more exact test of Kihlstrom and Laffont’s (1979) theory, since here individuals chose between a certain and a risky outcome.

wage earners.” Part of the inconclusiveness of the debate clearly stems from substantial variations in research design.

Empirical studies differ with respect to the category of entrepreneur, the type of comparison group, and the type of risk-measure. Caird (1991), Hull et al. (1980) and Ahmed (1985), for instance, use owner-managers, while Beagly (1995), and Stewart et al. (1999) use firm founders. Others have introduced self-employment as the entrepreneurial category (Van Praag and Cramer 2001; Uusitalo 2001). Comparison groups are usually constructed with relatively homogenous groups of professionals. Caird (1991) uses professional groups including teachers, nurses and clerks; Sarasvathy et al. (1998) uses bankers; Brockhaus (1980), Beagly and Boyd (1987) wage-employed business managers and Uusitalo (2001) army recruits who have not later become self-employed. Most studies derive risk-measures from psychological scales or from responses to scenario descriptions. For instance, Uusitalo (2001) uses a cautiousness test score, Brockhaus (1980) employs Kogan-Wallace choice dilemmas, and Cramer et al. (2002) measure reservation prices for hypothetical lottery tickets.

None of these studies, however, uses measures of risk derived from actual behavior in risky decisions linked to monetary incentives. The only exception is a small-scale study by Elston et al. (2006), which elicits risk preferences among 42 full-time and 38 part-time entrepreneurs who visited conventions for small business entrepreneurs.⁵ The authors recruit a control group of 102 non-entrepreneurs visiting the same conventions. The study finds moderate variations of risk aversion across different populations. While full-time entrepreneurs are somewhat less risk-

⁵ Sandri et al. (2010) also elicit risk-preferences among 15 high-tech entrepreneurs and various control groups, but the main focus of this study is inertia in disinvestment decisions.

averse than part-time entrepreneurs, neither type seems significantly different from non-entrepreneurs. Given sampling strategy and sample size, however, the study does not allow for robust inferences.

2.2 Ambiguity

Frank Knight (1921/2006, p. 231) was one of the first to emphasize that business decisions typically involve unmeasurable risk, because they “deal with situations which are far too unique, generally speaking, for any sort of statistical tabulation to have any value for guidance. The conception of an objectively measurable probability or chance is simply inapplicable.” Such uncertainty poses a dilemma for firms, in that economic actors must make investment and production decisions that shape long-term business strategy and performance despite not being able to assess downstream risks. Particularly at the start-up stage, the entrepreneur often faces incalculable uncertainty “where fools rush in where angels fear to treat”. Knight does not claim that entrepreneurs have a higher or lower aversion to uncertainty than others, but asserts that entrepreneurs may have a high “capacity for forming correct judgments” in uncertain situations, implying that entrepreneurs behave differently from others when acting under uncertainty (Knight, 1921/2006,p. 43). In order to reserve “uncertainty” as the more general concept, we use in the following the term “ambiguity” for situations where the probability distributions of the outcomes are completely or partially unknown. Our hypothesis is therefore:

H2: Entrepreneurs have a different degree of ambiguity aversion than others.

Research on entrepreneurs' tolerance of ambiguity is limited. Schere (1982) asserts that entrepreneurs should naturally be more tolerant towards ambiguity, given the uncertain outcome entrepreneurs are facing when exploiting entrepreneurial opportunities. His small scale empirical study of 52 firm founders and 65 managers confirms this. Similarly, Koh (1996) reports (in a study of 100 Hong Kong MBA's) that students who signal a higher interest in starting their own business also display a higher tolerance of ambiguity. Yet to our knowledge none of the studies so far has used incentivized behavioral tasks to explore risk ambiguity comparing entrepreneurs with other groups.

2.3 Willingness to compete

An essential feature of entrepreneurship is exposure to competition, which involves a risk contingent on the entrepreneur's performance in comparison to his competitors. There are at least two conceivable mechanisms behind differences in willingness to compete between entrepreneurs and others. The first concerns the beliefs about one's own performance relative to others. It is possible that entrepreneurs are more optimistic than others or may even be overconfident. The theoretical literature draws on this to explain excessive market entry (see e.g., Bernardo and Welch, 2001, Hayward et. al., 2006).⁶ The other possible mechanism is that entrepreneurs may have a preference for competition *per se*. For instance, Alfred Marshall (1890/1920, p. 23)

⁶ It is important to note that overconfidence and optimism are general human tendencies that are not restricted to competitive situations and should be distinguished from the more narrowly defined WTC.

claimed that “a manufacturer or a trader is often stimulated much more by the hope of victory over his rivals than by the desire to add something to his fortune.” Similarly, Schumpeter interprets the wish to innovate, to succeed, and to prove superiority as an exogenous factor having its roots in a person’s *Unternehmergeist*, the entrepreneurial spirit. It is “the will to conquer: the impulse to fight ... to succeed for the sake, not of the fruits of success, but of success itself” (Schumpeter, 1934), that sets entrepreneurs apart from others. This leads us to our third hypothesis:

H3: Entrepreneurs have a different willingness to compete than others.

We define willingness to compete as an individual’s preference for situations where individual performance is rewarded relative to others’ performance and not independently. To our knowledge, there is no empirical study that explores entrepreneurs’ willingness to compete in comparison to other groups. The closest study to ours is Elston et al. (2006), who compare market entry behavior between entrepreneurs and non-entrepreneurs. Subjects can choose between two options: They can either receive a fixed sum (10 USD) or enter a winner-takes-all competition with an unknown number of competitors. The result is that full-time entrepreneurs do not differ from non-entrepreneurs in terms of their willingness to enter a competition.⁷ Other, less closely related studies employ concepts like “need for achievement,” aiming to measure the willingness to undertake activities involving personal responsibility and clear feedback. Various studies indicate that entrepreneurs have a higher degree of confidence than other groups (see Shane, 2003, ch. 5). Since competitive processes both involve personal responsibility and clear feedback,

⁷ However, part-time entrepreneurs had a significantly lower willingness to enter compared to full-time entrepreneurs.

it is reasonable that confident individuals with a high need for achievement also have a high willingness to compete. In addition, optimism bias (i.e., the tendency to be over-optimistic about the outcomes of one's own action) may reinforce willingness to compete⁸ as over-optimism about one's own performance may draw individuals into competitive situations. Entrepreneurs indeed appear to have a higher degree of optimism bias than others (see Shane, 2003:96-116). For instance, Arabsheibani et al. (2000) find that self-employed persons are substantially more likely to make optimistic prognosis about their future economic situation than a control group of wage employed. These results are robust to the inclusions of actual outcomes.

2.4 Trust

In the words of James Coleman (1990, p. 91): "Situations involving trust constitute a subclass of those involving risk. They are situations in which the risk one takes depends on the performance of another actor." There is an element of the prisoner's dilemma in all repeated exchanges where defection is always possible even in a trusting relationship (Hardin, 1982). Trust is the willingness to expose oneself to such uncertainty. Entrepreneurs are constantly exposed to these "social risks" when interacting with suppliers, customers, employees, and their competitors. A delicate task is to strike a balance between trust and control. Jean-Baptiste Say long ago emphasized that the entrepreneur "must possess sufficient knowledge of mankind to preserve him from the dangers of misplaced confidence in his agents, correspondents, and connexions"

⁸ In many contexts overconfidence has the same implications as optimism bias, but since the former does not refer to confidence in judgements which in case may have ambiguous implications, we prefer the latter term.

(1803/1855, Section III, VII, p.30).⁹ He implies that entrepreneurs may be better at these decisions. Thus, whether or not trust in general is higher or lower among entrepreneurs compared to average people entrepreneurs may in a given situation have a different level of trust than others.¹⁰ Our fourth hypothesis states:

H4: Trust behavior among entrepreneurs is different from that among others.

Although trust is crucial for many entrepreneurial activities, and “social risk” a substantial part of the uncertainty faced by entrepreneurs, there is, to our knowledge, not a single empirical study comparing trust levels between representative groups of entrepreneurs and the general population.¹¹ The closest study to ours is Fehr and List (2004), comparing trust behavior between CEOs in the coffee industry and students in Costa Rica, and showing significantly higher trust and trustworthiness among the CEOs. However, since CEOs from just one industry are compared with another homogenous group (i.e. students), it is not obvious that these results will hold more generally. Other studies compare the social capital held by entrepreneurs and other groups. Social capital, often seen as a vehicle to establish various forms of trust, can in this sense also offer some indications on differences in trust.¹² For instance, Davidsson and Honig (2003) compared the social capital of nascent entrepreneurs and a control group. Their findings suggest that

⁹ For instance, trust behavior may indicate that an individual is exploitable and naïve. Karlan (2005) shows that more trusting people have a higher default risk than those that are less trusting.

¹⁰ This aspect is also emphasized by Knight (1921, p.43).

¹¹ There is one study by Bouckaert and Dhaene (2004) focussing on entrepreneurs’ trust level and ethnic origin. (Turkey or Belgium). No effort is made to investigate if entrepreneurs differ from the general population or other groups, which is natural since the purpose of this study is not to study the general characteristics of entrepreneurs.

¹² Social capital tends to have different meanings in various theoretical frameworks. In many of these, trust can be seen as a desirable state of mind generated by social activities and networking. However, it is important to note that trust is not the same as social capital, but in some frameworks trust may indicate its magnitude.

individuals holding more social capital (both “bonding” social capital measured by, e.g., family ties and “bridging” social capital measured by, e.g., memberships in business networks) were more likely to become entrepreneurs and to survive the start-up phase than others. Social capital may also promote entrepreneurial activity by reducing resource constraints such as access to external financial capital (see Batjargal and Liu, 2004) or labor power (see Light 1972; Nee and Sanders, 1996). In immigrant enclaves, for example, enforceable trust and bounded solidarity enable entrepreneurs to draw on social capital as credit slips to raise start-up capital and secure compliant workers (Portes and Sensenbrenner 1993).

3. Research Strategy and Design

The present study combines five aspects of controlled entrepreneurial behavior under uncertainty.

Study of incentivized behavioral tasks. As noted above, most of the research so far is based on psychological notions of attitudes towards uncertainty. This makes the economic interpretation of the results somewhat difficult. In contrast, the behavioral tasks used in this experiment have a relatively straightforward interpretation in economics. For instance, the behavioral task measuring risk can be directly related to the shape of the utility function. Furthermore, we agree with many experimental economists that the use of monetary incentives in behavioral tasks increases the credibility of the observed data.¹³ After all, entrepreneurial decisions involve real stakes. The introduction of monetary incentives therefore increases the external validity of our observations.

¹³ For a theory of incentives in experiments (see Smith, 1982). There is also evidence that subjects put a higher degree of cognitive effort in decisions when these are incentivized (see e.g., Camerer and Hogarth, 1999).

Parallel study of different facets of uncertainty. The simultaneous exposure to various forms of uncertainty calls for a more inclusive survey design to better grasp the nature of differences between entrepreneurs and other actors. Most importantly, our design helps to avoid taking for granted that differences between entrepreneurs and others in one dimension of uncertainty necessarily carry over to other dimensions. Testing numerous hypotheses with the same research design allows us to better distinguish between different behavioral characteristics. Consider the following example: The decision to trust generates a distribution of uncertain outcomes and the expected utility of this distribution is affected by the curvature of the decision maker's utility function in the same way as for standard risk decisions. In addition, beliefs about others' behavior affect trust. Evidently, the observation that entrepreneurs are more inclined to trust than others is open to two competing explanations. By also testing for risk preferences it is possible to distinguish between the two.

A focus on established entrepreneurs. Many studies of entrepreneurial characteristics have not adequately taken into account the type of entrepreneur used in their. For instance, a focus on self-employed individuals is fairly common. This may be perfectly reasonable for studying characteristics related to some specific forms of activities such as start-up strategies of very small businesses. However, the group of self-employed consists to a non-negligible extent of individuals unable to secure formal wage employment. Those individuals simply pushed towards self-employment for lack of alternatives obviously do not reflect the type of entrepreneurship that Say, Marshall, Schumpeter, Knight, Marshall, or Kirzner studied. Clearly, to take the classical studies exploring the nature of the entrepreneur to a critical test requires a focus on economic actors who have successfully started sizable entrepreneurial ventures that compete in markets through their innovative activity. Our study therefore focuses on established entrepreneurs who

are managing firms of some significance (with a sample average of 130 employees) and who have at least survived the first year of firm operation (with a sample median of eight years of business operation).¹⁴

Reliance on random sampling techniques. Many studies of entrepreneurs vs. other groups are based on what can be regarded as “convenience samples”. For instance, researchers visit public events attended by the intended survey population, and there potential subjects then self-select into the subject pool. This is fully understandable since entrepreneurs are busy people with little time to participate in studies or little interest in revealing any individual or firm-level information. However, the use of convenience samples naturally raises concerns over the external validity of findings (Levitt and List 2007). We have limited this problem by using a random stratified sample of entrepreneurs, as well as a control group consisting of randomly selected individuals that matches the entrepreneurs according to specific demographic variables. The entrepreneurs are obtained from complete firm registers of China’s Bureau of Industry and Commerce, the official agency in charge of private enterprise registration in China. Since the public definition of private firms requires a minimum number of seven employees, this also limits the risk of including in the sample of entrepreneurs small-scale household firms operating only based on family labor. The control group is a random sample based on local household registers.

Scale of sample size. Studies of controlled incentivized behavior are complicated and costly. Using entrepreneurs as the focal group complicates matters further since their time constraints

¹⁴ Obviously, there can be more than one mechanism (e.g. learning and selection) explaining any observed difference between established entrepreneurs and ordinary people. However, isolating the correct mechanisms is seen as a natural second step of this research and goes beyond the scope of the present paper.

make them particularly difficult to recruit, leading to relatively small-scale experiments.¹⁵ In this study we have obtained a fairly large sample of 700 entrepreneurs and 200 individuals sampled as a control group. Observations of potential “no differences” are therefore of great interest, since one can be relatively sure not to overlook substantive differences in the underlying distributions.

3.1 Design

The sample of entrepreneurs consists of 700 CEOs from an equal number of firms located in China’s Yangzi delta region, stretching from Shanghai municipality to the provinces of Zhejiang and Jiangsu, generally regarded as one of China’s most entrepreneurial areas, where private enterprise is well established and legitimized as an organizational form.¹⁶ Eighty-six percent of these CEOs were owners, and 78 percent founders or co-founders of the firm, thereby qualifying as “entrepreneurs” in the most literal meaning. The recruitment of participants followed a two-stage procedure. In a first step, participants were randomly sampled from local firm registers. In a second step, our local survey team activated social and business networks to secure the participation of the randomly recruited firms. The 200 subjects in the control group were selected from household registers in three of the seven cities representing the three participating provinces. The control group matches the entrepreneur-sample with respect to gender and age.

¹⁵ This does not necessarily have to be a problem, since large differences between entrepreneurs and others may be detected also in small samples. What is more problematic is that studies with few observations that do not detect any differences may have a limited value, since the few observations may mask moderate differences. This in turn may lead to a publication bias that favors studies reporting significant differences.

¹⁶ See map in Appendix.

The firms were stratified according to location (city), industry (type of products) and firm size. We selected seven out of the region's 16 municipalities (Nanjing, Nantong, and Changzhou in Jiangsu province; Wenzhou, Ningbo, and Hangzhou in Zhejiang province, and Shanghai municipality, see Figure 1). To narrow down industrial diversity, we selected five industries reflecting strong local production lines in the Yangzi delta region. These industries range from labor-intensive to technology-intensive productions covering textile, ordinary machinery, vehicle and auto parts, medical and pharmaceutical products, and computer and communication equipment. To reach sizable establishments, we have over-sampled "large" (more than 300 employees) and "medium-size" (100-300) companies.

FIGURE 1

To minimize the time and inconvenience for the participating entrepreneurs, the behavioral tasks were conducted at the firm site, usually a conference room or the entrepreneur's private office with no other people attending the experiment. After undergoing a specific training program designed to standardize the implementation of the experiment, teams of two local research assistants, also familiar with the local dialect, visited the firms to meet each entrepreneur. The session proceeded as follows: The entrepreneurs were asked questions about their background (education, demographics) and the firm (start-up capital, firm revenues, etc). Subjects in the control group, also visited by two research assistants, received the same set of questions, except for those about the firm and business. Each subject was then presented with four different behavioral tasks, designed to measure risk aversion, ambiguity aversion, trust, and willingness to cooperate. Afterwards, one task was randomly selected as the money-earning task. The earning was calculated and the entrepreneur received the payment.

Each behavioral task was formulated in a multiple price list format, where option A was expected to be the most attractive for the first decisions whereas the relative attractiveness of option B grew for decisions further down the list. This was done to minimize the cognitive load of the subjects and to make comparisons between tasks easier. After a number of pilot tests with university students in Lund (Sweden) and a pretest with 70 actual entrepreneurs located in the Yangzi delta region (10 in each of the seven survey cities), we decided not to present the tasks in form of a plain list (like in the table below). Instead we formulated each decision separately (see the Appendix), which seemed to make the tasks easier to grasp for the entrepreneurs. Below we describe the different tasks and how they were designed.¹⁷

3.1.1 Risk

Standard risk aversion was elicited according to the multiple price list format (see e.g., Binswanger, 1980, Holt and Laury, 2002), which has become more or less standard in experimental elicitation of risk aversion (see e.g., Andersson et al, 2006). We used two different lists, one with two lotteries of different relative risk (called task R1) and one with a certain outcome and a risky lottery (called task R2). This was done in order to investigate both the standard risk attitudes and the certainty effect (discussed above). The lists are presented in Table 1 below (with the five decisions in the middle omitted for reasons of space).

TABLE 1

¹⁷ The appendix contains the instructions and the forms used.

3.1.2 Ambiguity aversion

Ambiguity aversion was elicited by using the same numbers as in the R2 task but by letting the probabilities for the outcomes in option B be fully or partially unknown, denoted as the A1 and A2 task, respectively (see Table 2). This means that further information about the risky lottery is removed, which may increase the feeling of uncertainty.¹⁸ To investigate the degree of ambiguity aversion we need some “price” of the ambiguous lottery reflecting the aversion. This method is similar to the one used by Fox and Tversky (1995), who elicited the willingness to pay for some of their ambiguous lotteries.¹⁹ When the subject in our design switches from the certain (option A in the A1 task) to the ambiguous alternative (option B in the A1 task) we take this as an indication that the subject has reached her reservation price. In some business decisions one might know a lower or upper bound on the probability for an event but not the exact probability. To elicit the aversion to such situations we also included a treatment with partially ambiguous lotteries (the A2 task).

TABLE 2

3.1.3 Willingness to compete (WTC)

¹⁸ The standard elicitation of ambiguity goes back to Ellsberg (1961) who let people choose between lotteries from urns with known and unknown distributions. Ambiguity aversion is indicated by a general preference for the lottery with known probabilities.

¹⁹ It should be noted that the concept of ambiguity aversion here includes risk-aversion.

WTC may be triggered by many mechanisms and depending on which the subject considers important, there are different methods to elicit it. One method related to the one we used is to let subjects choose between a fixed fee and entering a contest with an unknown endogenously determined number of entrants, in which the winner gets a larger fixed prize (see Camerer and Lovo, 1999, Elston et. al., 2006). In these decisions, there is a certain alternative that is compared to an uncertain one. The subjective expected utility of the uncertain alternative will depend on many things, including beliefs about the number of entrants, the shape of the utility function (over the relevant outcomes), the belief about the subject's own performance relative to others and, possibly also, on preferences for competition per se (as suggested by Marshall). Since the shape of the utility function is investigated in the standard risk task, the purpose of our WTC elicitation is focussed on getting a more distinct measure of beliefs about relative performance and preferences for competition per se. To control for beliefs about others' entry decisions, the exact number of competitors is known by the subject. To dampen the risk element we compare two uncertain alternatives, where one involves a competitive element.²⁰ We also believe that in many situations, the alternative to an entrepreneurial income (at least in the long run) is not a fixed salary, which is the same for all, but rather, a performance based salary, which (like the entrepreneurial income) has an expected value associated to beliefs about absolute performance. The payoff for the winner in the competitive alternative is therefore scaled up from the individual one (see Table 3), which means that beliefs about absolute performance are more or less controlled for. Hence, the WTC measure used here emphasizes the subject's beliefs about his

²⁰ This design is partly inspired by Gneezy and Niederle (2003), Niederle and Vesterlund (2007) and Charness and Villeval (2009).

relative performance and potential preferences for competition per se.²¹ To get an indication of the subjects' relative performance belief we asked subjects to guess their performance in the task in comparison to their co-participant(s). Since the performance task was a trivia quiz, we asked "If you do the quiz, what percent of the other participants do you think will have more correct answers than you?"

In task C1 (see the Table 3) subjects could choose between being paid a certain sum (from 5CNY to 50 CNY) per correctly answered question (option A) in the quiz or entering a competition with another subject and being paid 50CNY per correctly answered question if the subject had the highest number of correct answers and 5CNY if the competitor had the highest number.²² We also included a task C2 where competition was multilateral instead of bilateral. In this case the subject could choose between the same option A as in C1, but option B concerned a competition with three other participants, thus making the competition fiercer.

TABLE 3

3.1.4 Trust

An individual's aversion to expose herself to the discretion of another person (the trustee) involves both a component of risk (in the sense that more than one outcome is possible) and a

²¹ Preference for competition per se should be seen as an empirical concept motivated by the attempt to find out if there is any difference between entrepreneurs and others to expose oneself for this particular type of uncertainty. (For gender differences, compare with Niederle and Vesterlund, 2007). If such a difference is observed, further theoretical and empirical research will be needed to explain it.

²² In the trivia quiz we used the quiz performance from a pre-test group of entrepreneurs as competitors.

belief component (the trustor's subjective belief that the trustee's action will be advantageous to him, or not). Entrepreneurial situations involving dependence on others typically involve both components, and they are seldom separated in the literature on trust behavior, but in this study of different facets of uncertainty it is important to separate them. We have therefore designed an elicitation method (denoted task T) where the trustor chooses between one socially risky option, in which the outcome is conditional upon the trustee's action (option A), and a risky option (B) in the standard "lottery" sense. The trustee can choose between two payments, the first giving the trustor 580 CNY and the trustee 50 CNY and the second payment giving the trustor 15 CNY and the trustee 55 CNY. This is intended to capture those situations where another person at a low personal cost can make a big difference to another person. For instance, an employee that is about to go home might detect that a machine needs lubrication. The employee can choose between lubrication which costs a few minutes extra work or ignore it, which will damage the machine and be very costly for the owner of the firm. Note that the trustor's decision in task T cannot in any obvious way be driven by social preferences. For instance, all standard parameterizations of the Fehr and Schmidt (1999) model would suggest that the trustor prefers the first to the second payment.²³

A small group from the staff at the Shanghai Academy of Social Sciences took the role as trustees. Decisions from this group were recorded for all conceivable contingencies (i.e., the strategy method was used). To participants in our experiment, the other person was intentionally

²³ However, it is quite possible that the trustor's behavior can be guided by his beliefs about the trustee's social preferences, but this is something different and a reasonable component in trust.

described in general terms (as an anonymous person who was born and lives in China), to capture what Putnam (2001) describes as “thin” trust.

TABLE 4

3.1.5 The Distribution of Tasks

Each subject was exposed to four different tasks, one for each type of uncertainty (see Table 5). To have some observations uncontaminated by potential order effects and to check for certain treatment effects, the entrepreneurs were divided into six different treatment groups. The distribution of tasks and their order were decided after several pilots and one pretest. Different issues like cognitive difficulties were taken into account. Each task was placed first in at least one treatment. The exception was task T, since this was the most difficult to grasp. However, it seemed to be easier to understand if the subject had first understood the multiple price list format through some of the other tasks. To minimize the potential influence of order effects in between subjects’ comparisons, we made sure to have the control group in their treatments getting the exact same sequences of tasks as the entrepreneurs. Hence, Treatment 1 and 7 are identical, and so are Treatment 3 and 9, and 4 and 8. Treatment 5 is identical to Treatment 10 for the three first tasks, but not the fourth.²⁴

TABLE 5

²⁴ The reason that they differed in the last task was that we wanted to get a better balance of the number of observations of the R1 and R2 task.

3.1.6 Training of research assistants

Starting on December 7, 2008, all research assistants participated in a three-day training program at the Shanghai Academy of Social Science led by the authors of this paper. Each assistant was trained to do the interviews and all tasks. They also received detailed written instructions and questionnaires for each task (available in Appendix). At the end of the training, teams of research assistants and supervisors, with the authors, went out into the field and with a number of entrepreneurs checked and tested the whole design. On these occasions assistants conducted the experiments. After successful completion of these training cases, we conducted a formal pretest on 70 entrepreneurs, which resulted in additional adjustments and fine-tuning of instruments before commencing large-scale field experiments with the 700 entrepreneurs and 200 participants of the control group.

3.2 Pros of conducting the experiment in China

A field experiment involving 700 randomly selected entrepreneurs would be a demanding undertaking anywhere in the world. The present study was naturally very costly and difficult to conduct. However, the organizational capabilities, education-level and labor costs in China are well documented and have attracted firms worldwide. A study of this magnitude exploits many of these country-specific advantages.

Generally, there is little reason to believe that China's private entrepreneurs differ much from their counterparts in other countries around the world. Entrepreneurs have to organize resources,

take decisions under various forms of uncertainty, negotiate, and compete in a highly competitive market economy.²⁵ These are common qualities generally noted by the classical literature on entrepreneurship, and they are not less valid in China's emerging market economy.

China's unique historical development accompanying the recent rise of private entrepreneurship even controls for some confounding effects usually present in firm samples in developed economies. At any given point in time, the structure of a private firm population naturally depends on a complex set of different determinants. Some firm-owners were simply pushed into entrepreneurship because they lost their job, and did not expect any other employment opportunities to open up. Others become second-generation entrepreneurs as they take over their parents' firms. Clearly, these firm-owners bear little resemblance to the entrepreneurial types or *pioneers* envisioned by Say, Marshall or Schumpeter. Ideally, one would like to explore a population of entrepreneurs where individuals actively self-select to become entrepreneurs. We claim that China provides an excellent research site to study such populations of true start-up entrepreneurs. First of all, the history of private entrepreneurship is relatively brief. Before 1988, private entrepreneurship was not even legalized, and full constitutional recognition was not granted before 2004. With this brief history, the current generation of entrepreneurs is truly a generation of founders, not yet diluted by owners of inherited productive assets. Moreover, during the pre-reform period before 1978, private business was banned, so that none of the entrepreneurs in our survey can draw on a continuous family history of entrepreneurial activities. Family background and social stratification can therefore be mostly

²⁵ All chosen industries in our study are highly competitive with relatively low concentration ratios. The highest concentration ratios are found in the vehicle and electronics sector with 20 percent market share of the top ten producers in the country.

ruled out as determinants of entrepreneurship. Finally, China's government has not implemented policies aimed at actively promoting private start-up firms. To the contrary, private entrepreneurs are disadvantaged relative to the state-owned enterprises, which benefit from government policies and loans from state-owned banks. Briefly, China's current generation of private industrialists represent a generation of start-up entrepreneurs who fit in an almost ideal way the original idea of entrepreneurship in the rise of modern capitalism in the West (Weber 1904-05; Schumpeter 1942).

4. Results

Table 6 summarizes the descriptive statistics of the 900 participants in our study. The matching of gender and age in the control group worked well with an almost identical composition of subjects with regard to these variables. In addition, the control group came from the same regions as the entrepreneurs. As to educational attainment, entrepreneurs have a somewhat higher level of education than the average control group member. Since education might affect choices in the risk task, we will explore whether potential differences are driven by this factor. Another factor to control for is the income or wealth of the subject. A proxy for this is self-reported annual personal income and as expected, entrepreneurs earn substantially more than the control group members. The median personal income of the entrepreneur was 175,000 CNY per year while the corresponding number was only 21,600 CNY per year among the control group members.²⁶

²⁶ A specific concern in using a high-income group like entrepreneurs in experiments is whether incentives can be considered salient (see Smith, 1982). However, even if the entrepreneurs belong to the high-income group, their median annual personal income is only around USD 25,000 (according to the exchange rate 6.83 in July 2009), as most entrepreneurs reinvest large parts of the company profits. This suggests substantial incentives can still be given

TABLE 6.

Our review of the results begins with the analysis of the mean switching points in the different treatment groups. For each task we have omitted a few observations due to incorrectly filled out forms.²⁷ To mitigate order effect we only compare groups where the groups have received the same treatments before the task under review.²⁸ This means that we pool only those treatment groups of entrepreneurs that have a matching control group.²⁹ Since each treatment group is equal in size, and we are interested in differences between the entrepreneurs and the control group, this practice should be unproblematic.

For each task we also conduct a regression analysis to check if the results are robust when we incorporate gender, age, education and annual income. We also control for experimenter effects in these regressions. Even if the interviewers were carefully instructed to act in a standardized way, it is well-known from psychology (see e.g., Rosenthal, 1966) that the experimenter may

at a reasonable cost. The average subject in our experiment earned 289 CNY (or USD 42) on the behavioral tasks that took only 25 minutes. The median entrepreneur's daily income (if he works 300 days a year) is 583 CNY, which suggest that if he received the average experimental earning, he got a half day's earnings in 25 minutes. Another way to look at the incentives, is to consider the average hourly experimental earning (which was 763 CNY) and correct for purchasing power (which was 1.95 according to the Big Mac index in July 2009). Using this, the average hourly experimental pay was around USD 200 from a US perspective.

²⁷ The most common reason for omission is so called "multiple switching points". However, this problem was mitigated by careful instructions and by having the assistants to repeat information when the subjects did not fully understand the task. The share of omitted observations is for no task above five percent.

²⁸ In a study of the multiple price list method, Andersen et al. (2006) detected that responding to a given task in a list might effect how the subject responded in later tasks.

²⁹ Thus, if a one treatment group of entrepreneurs received Task X before the task to be studied and another group received tasks YZ, we can pool these groups if and only we can find one treatment group in the control that received X and another that received YZ.

affect the subject.³⁰ Finally, we include all subjects that have performed a certain task and we control for order effects by dummy variables.

Definitions of “entrepreneurs” vary. Up to this point we defined entrepreneurs relatively broadly as company CEOs (denoted as “Entrepreneur”). This may appear as a natural choice since CEOs are in charge of most entrepreneurial decisions in everyday business operations. Notwithstanding, a narrower definition of the entrepreneur as the owner or actual founder of a firm may come closer to the classical concept of entrepreneurs as individuals who *undertake* a venture instead of relying on wage employment. To check if our regression results depend on the specific definition of the entrepreneurial role we run the same regressions also for the sub-sample of 604 owner-entrepreneurs (denoted as “Owners” in the regressions) and the group of 546 founders, who have actually started their company (denoted as “Founders”).

4.1 Risk

We begin by investigating the R1 task and compare entrepreneurs receiving treatment 3 with the control group receiving treatment 8. Table 7 summarizes the mean and standard deviations of the individual switching points. Clearly, both groups exhibit a certain degree of risk aversion, since a risk neutral subject should switch at decision 5 and a risk-lover at an earlier decision. This result is consistent with studies of risk aversion in other groups where the multiple price list method is used (for college students e.g. Holt and Laury, 2002, and for the general population Harisson,

³⁰ For each subject we record the interviewer who did the experiment. In the regressions each interviewer is treated as a dummy.

Lau, Rutström, 2007 and Gaudecker, Soest and Wengström, 2010). Contrary to what many probably would expect, the entrepreneurs are not more risk-taking than others. In fact, their average switching point (5.98) is slightly higher than the one for the control group (5.77), although the difference is not significant in a Wilcoxon-Mann-Whitney test (henceforth WMN-test). Note, since entrepreneurs have on average substantively higher incomes than the control group, this would reinforce risk-taking in the former group.³¹

TABLE 7.

When the decision is between a riskless outcome and a risky one, the entrepreneurs show a significantly lower inclination to take risk than the control group (see Table 7). The switching points among the entrepreneurs are significantly higher (MWM, $p=0.021$). However, this result is not robust in the regression analysis (see Table 8) when we include the control variables, which suggest that we do not find robust evidence against either of H1a and H1b. In the regressions the sign of the various definitions of entrepreneurs are negative, suggesting the reverse impact (i.e., less risk aversion) but the coefficients are far from significant. Few of the control variables predict the switching point well. Age is negatively correlated to risk aversion whereas education has the reverse sign. However, these coefficients are only marginally significant ($p<0.1$) and only in one regression equation each. We also observe some indications of experimenter effects, but

³¹ The effect of income on risk aversion in previous studies is not settled, but there is no evidence that it has a substantial impact on the subjects' risk-taking behavior (see e.g., Donkers et al, 2001, and Harrison et al., 2007, and von Gaudecker et al., 2010).

since there are more than twenty dummies representing different experimenters, this is not strange. Thus, we find no robust evidence of variables that predict standard risk-taking well, and in particular entrepreneurs do not differ from other ordinary people when it comes to these decisions.

TABLE 8.

4.2 Ambiguity

The results on the A1 and A2 tasks do not suggest that there are any notable differences on the level of ambiguity aversion between the groups (see Table 9). In regressions similar to those described above, we find no effects of being an entrepreneur (see Table 8). We only find that age and education have significant effects. Higher education is associated with lower ambiguity aversion in the A1 task when only owners and founder entrepreneurs are included. The effect is however only marginally significant. Age is negatively correlated to ambiguity aversion in the A2 task. This effect is more robust and holds at various levels of significance for all entrepreneurial specifications.

TABLE 9.

4.3 Willingness to compete

For the C1 and C2 tasks WTC is generally somewhat higher among entrepreneurs (see Table 10). The difference in switching point levels is significant for the C2 task and only at the ten percent

level (WMW, $p=0.082$). There is also a tendency that the entrepreneurs' distribution of switching points has a slightly lower variance. A Kolmogorov-Smirnov test rejects equality of distributions at the ten percent level of significance ($p=0.078$) for task C1. One possible explanation might be that entrepreneurs have a more distinct evaluation of this type of uncertainty. A natural question to ask is if the somewhat higher WTC among entrepreneurs is connected to the belief that they will have a higher score on the performance task than others. This is not the case, since the average relative performance beliefs of the entrepreneurs and the control subjects are almost identical.³² Hence, insofar the higher WTC among entrepreneurs seems to be driven by a preference for competition per se.

TABLE 10

In the regressions to predict the switching point of task C1, the coefficients for the entrepreneur variables are negative, suggesting higher willingness to compete among these groups (see Table 11). However, neither the entrepreneur variables nor the demographic variables are significant. The only significant variable is the one indicating the order of the task, which is of little interest since it is well known that the order of tasks may have effects in experiments. Estimation results for multilateral competition (task C2), however, reveal a different picture. Under inclusion of all control variables the entrepreneur variable is robustly significant at the five percent level (see Table 11). In all three samples, entrepreneurs are less averse to multilateral

³² In the C1 task both entrepreneurs and control subjects believed that 44.7 percent would have a higher score than themselves. In the C2 task entrepreneurs believed that 48.1 percent would have a higher score, and the corresponding figure among the control group was 48.9.

competition than ordinary people. We also find a significant gender effect. Male participants are more willing to compete than females, which is consistent with results reported by Gneezy et al. (2003).³³ Hence, the main conclusion in this section is that entrepreneurs are more willing to expose themselves to uncertainty related to competition in situations with more than one competitor.

TABLE 11

4.4 Trust

When it comes to trust, we find that entrepreneurs are more willing to expose themselves to social risks than the control group (see Table 12). The switching points of the entrepreneurs are significantly higher than for the control group (MWM, $p=0.012$).³⁴ The magnitude of the effect is moderate. The average difference between the switching points is 19 percent of the standard deviation. Since we compare two risky options, it is reasonable to interpret this difference as a higher confidence in another person's willingness to act favorably toward the subject.³⁵ Entrepreneurs routinely rely on on-going personal ties in upstream and downstream transactions with their suppliers and distributors. Moreover, in industrial clusters the capacity for on-the-fly

³³ The result by Gneezy et al. (2003) is based on student subjects. The present study's results suggest that these gender differences also hold in multilateral competition among more experienced subjects, namely CEO:s who own or founded their firms together with a control group..

³⁴ Note, in contrast to earlier tasks, the switching point is increasing in the subject's willingness to expose himself to this uncertainty (i.e., to trust).

³⁵ Note also that since we did not detect any significant difference in risk aversion when to risky alternatives were present, it is unlikely that this result is being driven by risk aversion.

cooperation between producers is an important source of competitive advantage (Uzzi 1996). Because business networks provide a ready conduit of fine-grained information on reputation and trustworthiness, trust in relational contracting may be a self-reinforcing feature of entrepreneurial activity.

The regression analysis strongly confirms the robustness of the result (see Table 11). The dummy for entrepreneur is significant with the expected sign at the 1 percent level in all three equations. In addition to the order variable, there is a marginally significant negative effect of income in one specification. The non-parametric result and the regression analysis suggest that we can be confident in the finding that entrepreneurs have a higher tolerance of social risks than other people.

TABLE 12.

5. Concluding Remarks

This paper reports a first large-scale experimental study based on a randomly sampled population to investigate whether entrepreneurs differ from other people in their willingness to expose themselves to various dimensions of uncertainty typically discussed in the entrepreneurship literature. Our design includes a stratified random sample of 700 established start-up entrepreneurs and 200 control group members from the Yangzi delta region in China who are exposed to experimental tasks with substantial monetary incentives. We employ a multidimensional design emphasizing that uncertainty has many facets, which all need careful consideration in any attempt to understand the nature of distinct entrepreneurial traits. In contrast to common wisdom, our results do not suggest that entrepreneurs generally differ from other

people when it comes to behavior under uncertainty. Entrepreneurs do not seem to cope better than others when exposed to non-strategic forms of uncertainty such as situations involving standard risk or ambiguity. Although this contradicts some theories (e.g. of Kihlstrom and Laffont, 1979), the result may be less striking given our focus on established entrepreneurs. In this sense, our sample may reflect that the market punishes and weeds out less prudent individuals who are willing to take unnecessary risks.³⁶

At the same time, entrepreneurs seem to be more willing to bear uncertainties involving a strategic element. First of all, entrepreneurs are significantly more willing to enter situations involving multilateral competition than members of the control group. This result is not unexpected. An essential feature of entrepreneurship is to compete with other firms in various respects and also to expose others (e.g., upstream firms and employees) to competitive pressure. Established entrepreneurs can therefore not shy away from competition. It is also quite possible that this group, as suggested by e.g., Marshall and Schumpeter, has a particular preference for such situations. Secondly, entrepreneurs are more willing to accept uncertainties related to trusting an anonymous other. Due to our design and our previous result we can clearly rule out lower risk aversion among entrepreneurs as a causal explanation. Still, several alternative explanations remain and further research is needed to disentangle the deeper mechanisms involved. A preliminary but plausible explanation is that entrepreneurship requires a balanced amount of trust, and that individuals with this ability are selected into the group of entrepreneurs. Clearly entrepreneurship is not a purely individualistic endeavor and requires cooperation with

³⁶ This interpretation would be at least partly consistent with the finding that the survival rate among entrepreneurs who score high on risk attitude questionnaires is smaller than the one for entrepreneurs who score at the medium level (see Caliendo et al. 2010).

suppliers, customer, and also competitors. Trust may therefore provide the glue that makes business networks actually work.

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Appendix

Content

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- Figures

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-Experimental Instructions and Tasks to Subjects*

- Written instructions to research assistants in China*

* Not for publication. Will be made available online.

Tables

Table 1. Decisions in Task R1 and R2

	Task R1		Task R2	
Decision	Option A (probabilities of payoffs)	Option B (probabilities of payoffs)	Option A	Option B (probabilities of payoffs)
1	10% of 300 CNY 90% of 240 CNY	10% of 580 CNY 90% of 15 CNY	360 CNY	10% of 580 CNY 90% of 15 CNY
2	20% of 300 CNY 80% of 240 CNY	20% of 580 CNY 80% of 15 CNY	330 CNY	20% of 580 CNY 80% of 15 CNY
3	30% of 300 CNY 70% of 240 CNY	30% of 580 CNY 70% of 15 CNY	300 CNY	30% of 580 CNY 70% of 15 CNY
.....
9	90% of 300 CNY 10% of 240 CNY	90% of 580 CNY 10% of 15 CNY	120 CNY	90% of 580 CNY 10% of 15 CNY
10	100% of 300 CNY	100% of 580 CNY	90 CNY	100% of 580 CNY

Table 2. Decisions in Task A1 and A2.

	Task A1		Task A2	
Decision	Option A	Option B (probabilities of payoffs)	Option A	Option B (probabilities of payoffs)
1	360 CNY	? of 580 CNY ? ? of 15 CNY	360 CNY	At least 25% of 580 CNY At least 25% of 15 CNY
2	330 CNY	? of 580 CNY ? ? of 15 CNY	330 CNY	At least 25% of 580 CNY At least 25% of 15 CNY
.....
9	120 CNY	? of 580 CNY ? ? of 15 CNY	120 CNY	At least 25% of 580 CNY At least 25% of 15 CNY
10	90 CNY	? of 580 CNY ? ? of 15 CNY	90 CNY	At least 25% of 580 CNY At least 25% of 15 CNY

Table 3. Decisions in Task C1.

Decision	Option A (Amount earned per correct answer)	Option B (Amount earned per correct answer)	Circle your choice of Option
1	50 CNY	50 CNY if you have the highest number of correct answers 5 CNY if your co-participant has the highest number of correct answers	A B
2	45 CNY	50 CNY if you have the highest number of correct answers 5 CNY if your co-participant has the highest number of correct answers	A B
.....
9	10 CNY	50 CNY if you have the highest number of correct answers 5 CNY if your co-participant has the highest number of correct answers	A B
10	5 CNY	50 CNY if you have the highest number of correct answers 5 CNY if your co-participant has the highest number of correct answers	A B

Table 4. Decisions in Task T.

Decision	Option A	Option B (probabilities for payments)	Circle your choice of Option
1	X decides between Payment I and II.	10% of Payment I 90 % of Payment II	A B
2	X decides between Payment I and II.	20 % of Payment I 80 % of Payment II	A B
.....
9	X decides between Payment I and II.	90 % of Payment I 10 % of Payment II	A B
10	X decides between Payment I and II.	100 % of Payment I	A B

Table 5. Session design.

Entre-preneurs							Control Group				
Treatment	1	2	3	4	5	6	Treatment	7	8	9	10
1 st task	A1	A2	R1	R2	C1	C2	1 st task	A1	R2	R1	C1
2 nd task	R2	R1	A2	A1	T	T	2 nd task	R2	A1	A2	T
3 rd task	T	T	T	T	A1	A2	3 rd task	T	T	T	A1
4 th task	C1	C2	C1	C2	R2	R1	4 th task	C1	C2	C1	R1
# subjects	117	117	117	117	116	116	# subjects	50	50	50	50

Table 6. Descriptive characteristics of subjects.

Variable	Entrepreneurs	Control Group
Gender (% males)	83.3	85.5
Age (median age at the start of 2009)*	41.5	40.5
Education (% junior high school or lower)	13.9	30.5
Vocational school/high school	28.6	32.5
Junior college	32.1	26
Undergraduate university (or higher)	25.4	11
Median annual income (1000CNY)	21.6	175

Table 7. Results on the risk-taking tasks.

	Entrepreneurs	Control Group	Hypothesis
R1 task			
Mean	5.98	5.77	H1a not rejected
Standard deviation	1.69	2.36	
#observations	111	48	
Treatment group(s)	3	8	
R2 task			
Mean	5.86	5.30	H1b rejected**
Standard deviation	1.80	1.86	
#observations	234	98	
Treatment group(s)	1, 4	7, 8	

** Statistical significant at the 5 percent level.

Table 8: Non-strategic uncertainty

	R1 task			R2 task			A1 task			A2 task		
	Coeff			Coeff			Coeff			Coeff		
	(se)			(se)			(se)			(se)		
Entrepreneur	-.153 (.243)			-.003 (.253)			-.064 (.234)			-.173 (.284)		
Owner	-.087 (.025)			-.011 (.267)			.026 (.248)			-.016 (.291)		
Founder	-.092 (.253)			-.050 (.288)			.093 (.265)			-.026 (.0298)		
Male	-.096 (.133)	-.096 (.145)	-.074 (.149)	-.005 (.146)	-.058 (.160)	-.024 (.172)	.079 (.139)	.031 (.151)	.034 (.0161)	-.053 (.140)	-.132 (.152)	-.082 (.157)
Age	-.010 (.006)	-.010 (.007)	-.012* (.007)	-.002 (.007)	-.002 (.007)	-.005 (.008)	.002 (.006)	.003 (.007)	-.002 (.007)	-.013* (.007)	-.015** (.007)	-.017** (.008)
Education	.015 (.019)	.014 (.021)	.005 (.021)	.028 (.020)	.033 (.022)	.044* (.024)	.030 (.019)	.035* (.021)	.041* (.022)	.005 (.021)	.006 (.022)	.002 (.023)
Log Income	.009 (.061)	-.005 (.063)	-.010 (.064)	.003 (.073)	.016 (.076)	.018 (.082)	-.037 (.068)	-.040 (.070)	-.017 (.075)	.006 (.064)	-.031 (.067)	-.046 (.069)
Task 2	-.071 (.133)	-.156 (.141)	-.087 (.145)	.084 (.120)	-.006 (.127)	-.015 (.134)	.075 (.120)	.156 (.127)	.137 (.134)	-.009 (.137)	.026 (.145)	-.012 (.149)
Task 3							.030 (.119)	.033 (.126)	.029 (.134)	-.008 (.136)	.021 (.147)	-.012 (.153)
Task 4	-.170 (.119)	-.201 (.126)	-.174 (.130)	.117 (.135)	-.007 (.147)	.095 (.158)						
Interviewer ^a	YES	YES	YES	YES*	YES*	YES*	YES*	YES*	YES**	YES	YES	YES
Prob>Chi2	.009	.019	.012	.002	.008	.019	.005	.009	.003	.048	.033	.039
Pseudo R2	.032	.032	.035	.037	.037	.038	.030	.031	.037	.028	.032	.033
Observations	429	382	362	430	381	344	466	418	381	391	346	326

^a Dummy variables indicate the main interviewer conducting the experiment; level of significance reflects highest level of significance found for at least one dummy variable.

* Statistically significant at 10 percent level; ** statistically significant at 5 percent level, *** statistically significant at 1 percent level.

Table 9. Results on the ambiguity tasks.

	Entrepreneurs	Control Group	Hypothesis
A1 task			
Mean	6.25	6.11	H2 not rejected
Standard deviation	2.05	2.45	
#observations	347	147	
Treatment group(s)	1, 4, 5	7, 8, 10	
A2 task			
Mean	6.22	6.28	H2 not rejected
Standard deviation	2.10	2.43	
#observations	115	49	
Treatment group(s)	3	9	

Table 10: Results on the willingness-to-compete tasks.

	Entrepreneurs	Control Group	Hypothesis
C1 task			
Mean	6.21	6.39	H3 not rejected
Standard deviation	1.69	1.91	
#observations	344	147	
Treatment group(s)	1, 3, 5	7, 9, 10	
C2 task			
Mean	6.10	6.76	H3 rejected*
Standard deviation	1.71	1.97	
#observations	116	50	
Treatment group(s)	4	8	

* Statistical significant at the 10 percent level.

Table 11: Strategic Uncertainty

	C1 task			C2 task			T task		
	Coeff			Coeff			Coeff		
	(se)			(se)			(se)		
Entrepreneur	-.192 (.229)			-.731** (.283)			.534*** (.170)		
Owner	-.289 (.238)			-.639** (.294)			.564*** (.177)		
Founder	-.213 (.255)			-.641** (.299)			.560*** (.184)		
Male	-.014 (.135)	.049 (.145)	.035 (.152)	-.228 (.145)	-.354** (.162)	-.411** (.170)	.066 (.096)	.024 (.105)	.099 (.111)
Age	-.003 (.006)	-.006 (.007)	-.007 (.007)	-.012* (.006)	-.010 (.007)	-.013* (.007)	.000 (.004)	.001 (.005)	-.002 (.005)
Education	-.005 (.019)	-.009 (.020)	.006 (.021)	-.032 (.021)	-.030 (.023)	-.030 (.024)	.013 (.014)	.019 (.015)	.0173 (.0153)
Log Income	-.006 (.061)	.0132 (.062)	-.001 (.065)	.082 (.074)	.070 (.078)	.081 (.082)	-.077* (.046)	-.078 (.047)	-.050 (.050)
Task 3							.136* (.076)	.163** (.081)	.180** (.086)
Task 4	-.217** (.103)	-.184* (.110)	-.184 (.117)	-.293** (.119)	-.176 (.131)	-.127 (.137)			
Interviewer	YES**	YES**	YES***	YES**	YES***	YES***	YES*	YES*	YES**
Prob>Chi2	.000	.000	.000	.000	.001	.000	.000	.000	.000
Pseudo R2	.040	.042	.050	.049	.047	.052	.025	.028	.028
Observations	467	425	390	391	337	317	862	766	708

^a Dummy variables indicate the main interviewer conducting the experiment; level of significance reflects highest level of significance found for at least one dummy variable.

* Statistically significant at 10 percent level; ** statistically significant at 5 percent level, *** statistically significant at 1 percent level

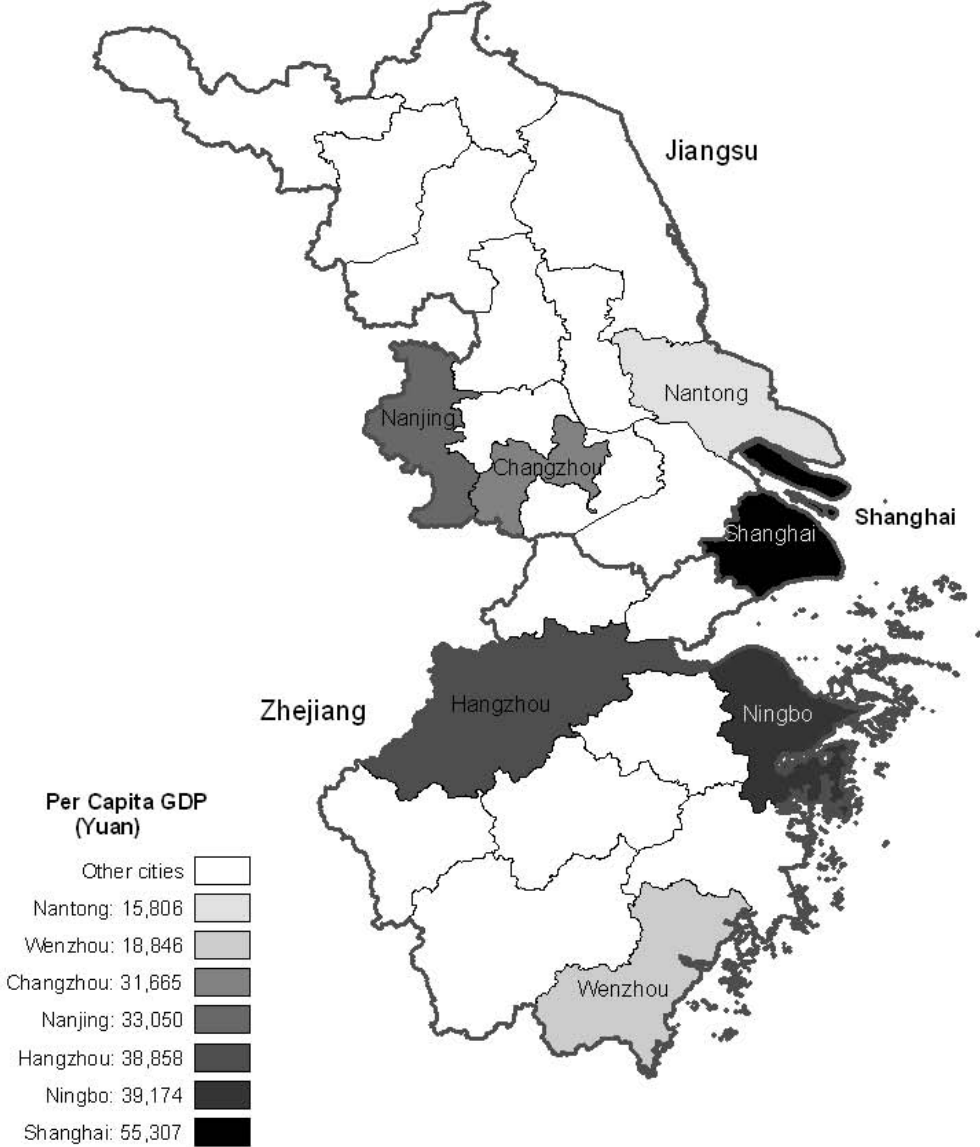
Table 12. Results on trust task.

	Entrepreneurs	Control Group	Hypothesis
T task			
Mean	5.16	4.79	H4 rejected**
Standard deviation	2.00	1.95	
#observations	464	197	
Treatment group(s)	1, 3, 4, 5	7, 8, 9, 10	

** Statistical significant at the 5 percent level.

Figures

Figure 1. Location and economic conditions of the research sites in the Yangzi region



Experimental Instructions and Tasks to Subjects (Not to be published, will be available online)

QID |_|_|_|_|_|

Firm name: _____

Interviewer name: _____

General information (GI)

The purpose of this part of the study is to gain additional insights into economic behavior. You will make choices in different situations that will be explained later. To make it more interesting, realistic and fun, we will, at random let participants in this study earn some real money. One of your choices made will be selected at random to determine a “money-earning decision” and you will be paid today according to your choice in this task. Hence, the amount of money you earn will depend on the choices made. This means that you may earn money on any of the decisions made, but you will not know how much you will earn, before you have made all choices. The maximum amount you can earn is 580 CNY and the minimum is 0 CNY.

You should know the possibility to earn real money is important in economic experiments and that there are strict rules against deceiving persons that participate. Hence, all information given here about money and other aspects are true and will be carried out according to the information given. Please, note also that there are no “right” or “wrong” choices in the decisions you are going to make. Therefore, make decisions according to what you think is best. Your answers will only be used for research purposes and will be kept strictly confidential.

Read the instructions to each task carefully. Ask the Interviewer if there is anything you do not understand. In each task you will make ten decisions where you choose between two options.

(A1)

(Note, A2 was formulated exactly in the same way but the payoffs reflect partial ambiguity as explained in 3.1.2.)

We offer you two different options. Please choose the option that seems preferable to you (to be described below):

Option A: You receive a given sum of money.

Option B: You either receive a high payoff (580 CNY) or a low payoff (15 CNY). The probabilities of the high payoff and the low payoff are unknown.

The exact probabilities of the outcomes in Option B will be determined afterwards, which means that right now they are also unknown to the Interviewer.

Decision 1: (Circle your choice of Option below):

Option A I would like to get 360 CNY for sure.

Option B I would like to have a random draw where I either get 580 CNY or 15 CNY though the winning probabilities are not known.

Decision 2: (Circle your choice of Option below):

Option A I would like to get 330 CNY for sure.

Option B I would like to have a random draw where I either get 580 CNY or 15 CNY though the winning probabilities are not known.

Decision 3: (Circle your choice of Option below):

Option A I would like to get 300 CNY for sure.

Option B I would like to have a random draw where I either get 580 CNY or 15 CNY though the winning probabilities are not known.

Decision 4: (Circle your choice of Option below):

Option A I would like to get 270 CNY for sure.

Option B I would like to have a random draw where I either get 580 CNY or 15 CNY though the winning probabilities are not known.

Decision 5: (Circle your choice of Option below):

Option A I would like to get 240 CNY for sure.

Option B I would like to have a random draw where I either get 580 CNY or 15 CNY though the winning probabilities are not known.

Decision 6: (Circle your choice of Option below):

Option A I would like to get 210 CNY for sure.

Option B I would like to have a random draw where I either get 580 CNY or 15 CNY though the winning probabilities are not known.

Decision 7: (Circle your choice of Option below):

Option A I would like to get 180 CNY for sure.

Option B I would like to have a random draw where I either get 580 CNY or 15 CNY though the winning probabilities are not known.

Decision 8: (Circle your choice of Option below):

Option A I would like to get 150 CNY for sure.

Option B I would like to have a random draw where I either get 580 CNY or 15 CNY though the winning probabilities are not known.

Decision 9: (Circle your choice of Option below):

Option A I would like to get 120 CNY for sure.

Option B I would like to have a random draw where I either get 580 CNY or 15 CNY though the winning probabilities are not known.

Decision 10: (Circle your choice of Option below):

Option A I would like to get 90 CNY for sure.

Option B I would like to have a random draw where I either get 580 CNY or 15 CNY though the winning probabilities are not known.

(R2)

(Note, R1 was formulated exactly in the same way but the options were the ones given in section 3.1.1.)

We offer you two different options. Please choose the option that seems preferable to you (to be described below):

Option A: You receive a given sum of money.

Option B: You either receive a high payoff (580 CNY) or a low payoff (15 CNY). The probabilities of the high payoff and the low payoff are given below.

Decision 1: (Circle your choice of Option below):

Option A I would like to get 360 CNY for sure.

Option B I would like to have a random draw: I either get 580 CNY or 15 CNY. The probability of 580 CNY is 10% and the probability of 15 CNY is 90%.

Decision 2: (Circle your choice of Option below):

Option A I would like to get 330 CNY for sure.

Option B I would like to have a random draw where I either get 580 CNY or 15 CNY. The probability of 580 CNY is 20% and the probability of 15 CNY is 80%.

Decision 3: (Circle your choice of Option below):

Option A I would like to get 300 CNY for sure.

Option B I would like to have a random draw where I either get 580 CNY or 15 CNY. The probability of 580 CNY is 30% and the probability of 15 CNY is 70%.

Decision 4: (Circle your choice of Option below):

Option A I would like to get 270 CNY for sure.

Option B I would like to have a random draw where I either get 580 CNY or 15 CNY. The probability of 580 CNY is 40% and the probability of 15 CNY is 60%.

Decision 5: (Circle your choice of Option below):

Option A I would like to get 240 CNY for sure.

Option B I would like to have a random draw where I either get 580 CNY or 15 CNY.
The probability of 580 CNY is 50% and the probability of 15 CNY is 50%.

Decision 6: (Circle your choice of Option below):

Option A I would like to get 210 CNY for sure.

Option B I would like to have a random draw where I either get 580 CNY or 15 CNY.
The probability of 580 CNY is 60% and the probability of 15 CNY is 40%.

Decision 7: (Circle your choice of Option below):

Option A I would like to get 180 CNY for sure.

Option B I would like to have a random draw where I either get 580 CNY or 15 CNY.
The probability of 580 CNY is 70% and the probability of 15 CNY is 30%.

Decision 8: (Circle your choice of Option below):

Option A I would like to get 150 CNY for sure.

Option B I would like to have a random draw where I either get 580 CNY or 15 CNY.
The probability of 580 CNY is 80% and the probability of 15 CNY is 20%.

Decision 9: (Circle your choice of Option below):

Option A I would like to get 120 CNY for sure.

Option B I would like to have a random draw where I either get 580 CNY or 15 CNY.
The probability of 580 CNY is 90% and the probability of 15 CNY is 10%.

Decision 10: (Circle your choice of Option below):

Option A I would like to get 90 CNY for sure.

Option B I would like to get 580 CNY for sure.

(T)

In this situation one of two payments is possible. Each payment will give you and a person you probably do not know (say person X) a certain payoff:

Payment I: you get 580 CNY and X gets 50 CNY.

Payment II: you get 15 CNY and X gets 55 CNY.

You can not choose payment, but you can choose between two options (A, B) of how the payment is to be decided:

Option A: You let X decide about the payment of money. (See further explanation below.)

Option B: Payment I and II are chosen according to the probabilities below.

Further explanation: X has already made his/her decisions, but we will not tell you about them. So you have to make your own decision based on what you think X has decided.

We have information about X:s decisions in an envelope. This envelope will be opened only if one of the decisions below is randomly selected as your “money-earning decision”. X has been informed that you will be asked to choose between the two options (A, B). X made his/her choice contingent on you choosing Option A in each of the decisions below. X does not know your identity and you will not learn the identity of X either. However, you should know that X is borne and lives in China.

Decision 1: (Circle your choice of Option below):

Option A I let X decide between Payment I (I get 580 CNY and X gets 50 CNY) and Payment II (I get 15 CNY and X gets 55 CNY).

Option B I would like to get Payment II for sure.

Decision 2: (Circle your choice of Option below):

Option A I let X decide between Payment I (I get 580 CNY and X gets 50 CNY) and Payment II (I get 15 CNY and X gets 55 CNY).

Option B I would like to have a random draw where we either get Payment I or Payment II. The probability of Payment I is 10% and the probability of Payment II is 90%.

Decision 3: (Circle your choice of Option below):

Option A I let X decide between Payment I (I get 580 CNY and X gets 50 CNY) and Payment II (I get 15 CNY and X gets 55 CNY).

Option B I would like to have a random draw where we either get Payment I or Payment II. The probability of Payment I is 20% and the probability of Payment II is 80%.

Decision 4: (Circle your choice of Option below):

Option A I let X decide between Payment I (I get 580 CNY and X gets 50 CNY) and Payment II (I get 15 CNY and X gets 55 CNY).

Option B I would like to have a random draw where we either get Payment I or Payment II. The probability of Payment I is 30% and the probability of Payment II is 70%.

Decision 5: (Circle your choice of Option below):

Option A I let X decide between Payment I (I get 580 CNY and X gets 50 CNY) and Payment II (I get 15 CNY and X gets 55 CNY).

Option B I would like to have a random draw where we either get Payment I or Payment II. The probability of Payment I is 40% and the probability of Payment II is 60%.

Decision 6: (Circle your choice of Option below):

Option A I let X decide between Payment I (I get 580 CNY and X gets 50 CNY) and Payment II (I get 15 CNY and X gets 55 CNY).

Option B I would like to have a random draw where we either get Payment I or Payment II. The probability of Payment I is 50% and the probability of Payment II is 50%.

Decision 7: (Circle your choice of Option below):

Option A I let X decide between Payment I (I get 580 CNY and X gets 50 CNY) and Payment II (I get 15 CNY and X gets 55 CNY).

Option B I would like to have a random draw where we either get Payment I or Payment II. The probability of Payment I is 60% and the probability of Payment II is 40%.

Decision 8: (Circle your choice of Option below):

Option A I let X decide between Payment I (I get 580 CNY and X gets 50 CNY) and Payment II (I get 15 CNY and X gets 55 CNY).

Option B I would like to have a random draw where we either get Payment I or Payment II. The probability of Payment I is 70% and the probability of Payment II is 30%.

Decision 9: (Circle your choice of Option below):

Option A I let X decide between Payment I (I get 580 CNY and X gets 50 CNY) and Payment II (I get 15 CNY and X gets 55 CNY).

Option B I would like to have a random draw where we either get Payment I or Payment II. The probability of Payment I is 80% and the probability of Payment II is 20%.

Decision 10: (Circle your choice of Option below):

Option A I let X decide between Payment I (I get 580 CNY and X gets 50 CNY) and Payment II (I get 15 CNY and X gets 55 CNY).

Option B I would like to have a random draw where we either get Payment I or Payment II. The probability of Payment I is 90% and the probability of Payment II is 10%.

(C1)

(Note, C2 was formulated exactly in the same way but the options reflect multilateral competition as explained in section 3.1.3.)

This decision concerns a little 10-item trivia quiz. The topic could be anything from “sports” to “movie stars”. The task is to answer as many questions correctly as possible, but we will only actually ask you these questions, if this task is randomly selected as your “money-earning-decision”. You will then be paid according to the number of correct answers. At this stage you must choose between two options of how to be paid (see below).

Option A: A certain amount per correct answer.

Option B: You choose to be randomly matched with another participant in this study (who already has answered the questions).

You will earn 50 CNY per correct answer, if you have the highest number of correct answers.

You earn 5 CNY per correct answer if your co-participant answers more questions correctly than you.

In case of a tie, a random draw determines if you receive 50 CNY or 5 CNY per correct answer.

The interviewer has an envelope with results from other participants. If this task is randomly selected (as your “money-earning-decision”), you will be asked to draw a co-participant to be matched with at random.

Decision 1: (Circle your choice of Option below):

Option A I would like to earn 50 CNY per correct answer..

Option B I would like to be matched with another participant and earn 50 CNY if I have the higher number of correct answers and 5 CNY if my co-participant has the higher number of correct answers.

Decision 2: (Circle your choice of Option below):

Option A I would like to earn 45 CNY per correct answer..

Option B I would like to be matched with another participant and earn 50 CNY if I have the higher number of correct answers and 5 CNY if my co-participant has the higher number of correct answers.

Decision 3: (Circle your choice of Option below):

Option A I would like to earn 40 CNY per correct answer..

Option B I would like to be matched with another participant and earn 50 CNY if I have the higher number of correct answers and 5 CNY if my co-participant has the higher number of correct answers.

Decision 4: (Circle your choice of Option below):

Option A I would like to earn 35 CNY per correct answer..

Option B I would like to be matched with another participant and earn 50 CNY if I have the higher number of correct answers and 5 CNY if my co-participant has the higher number of correct answers.

Decision 5: (Circle your choice of Option below):

Option A I would like to earn 30 CNY per correct answer..

Option B I would like to be matched with another participant and earn 50 CNY if I have the higher number of correct answers and 5 CNY if my co-participant has the higher number of correct answers.

Decision 6: (Circle your choice of Option below):

Option A I would like to earn 25 CNY per correct answer..

Option B I would like to be matched with another participant and earn 50 CNY if I have the higher number of correct answers and 5 CNY if my co-participant has the higher number of correct answers.

Decision 7: (Circle your choice of Option below):

Option A I would like to earn 20 CNY per correct answer..

Option B I would like to be matched with another participant and earn 50 CNY if I have the higher number of correct answers and 5 CNY if my co-participant has the higher number of correct answers.

Decision 8: (Circle your choice of Option below):

Option A I would like to earn 15 CNY per correct answer..

Option B I would like to be matched with another participant and earn 50 CNY if I have the higher number of correct answers and 5 CNY if my co-participant has the higher number of correct answers.

Decision 9: (Circle your choice of Option below):

Option A I would like to earn 10 CNY per correct answer..

Option B I would like to be matched with another participant and earn 50 CNY if I have the higher number of correct answers and 5 CNY if my co-participant has the higher number of correct answers.

Decision 10: (Circle your choice of Option below):

Option A I would like to earn 5 CNY per correct answer..

Option B I would like to be matched with another participant and earn 50 CNY if I have the higher number of correct answers and 5 CNY if my co-participant has the higher number of correct answers.

You are now asked to guess how good your performance in the quiz will be in comparison to all other participants that have taken the quiz.

If you do the quiz how many percent of the other participants do you think will have more correct answers than you? _____ (a number between 0 and 100).

Quiz-form (C1 and C2 task)

10 trivia Quiz (Yes / or no questions/statements)

1. Shanghai World Financial Center (SWFC) has more than 105 floors?
2. As a young boy, Barack Obama's lived more than three years in Malaysia and went to local schools in Kuala Lumpur?
3. China won most gold medals in the summer Olympics game in Beijing.
4. China won less than 25 silver medals in the Olympic games in Beijing.
5. Abba was a pop group from from Sweden.
6. Zhang Yimou is 55 years old.
7. In 2006, Beijing's officially registered population was more than 18 million.
8. Gong Li acted in the movie House of Flying Daggers (**Shí Miàn Mái Fú**)
- 9..Deng Xiaoping was born in 1901 in Guangan.
10. According to information from China's statistical yearbook, China has produced more than 500 million mobile phones in 2006.

Instructions to Interviewers (not to be published, will be available online)

This part contains instructions to interviewers. For each task there are instructions and a list of material needed (forms, decks of cards etc).

Task: General Information (GI):

Instruction for conversation:

Interviewer, please note, don't read sentences in **【】**

Instruction:

1. Please read the General Information page. Please do not turn pages. I will explain it to you after you finish reading.
2. Each of the following pages describes different tasks and there are 4 different tasks. Each task has ten decisions for you to make and these different tasks are independent of each other.
3. Next I will explain how the payment works. After you have made all decisions, we will have a deck of cards **【Interviewer, please show the envelope of cards that will be used – envelope marked “Money earning decisions”】** . Each of your decision is represented with one card in this deck. We will ask you to draw one card from the deck and that card will determine the money earning decision.
4. Do you have any questions?
5. **【Interviewer, answer the questions until you are sure that the subject understands.】**
6. now please turn to the next page.

<p><i>Material:</i> GI-form, Envelope marked “Money earning decisions”, Questionnaire with experimental tasks in proper order (one for each of the eight treatments), pen (do not use pencils).</p>

Task A1, A2

1. Please read the form.
2. **【Interviewer, please observe whether the subject has finished reading】** Let me explain it to you. You have read in the General Information that we will ask you to randomly select one of your decisions as the money earning decision. If any of the decisions in this task is randomly selected as the money earning decision, the payment proceeds as follows.

If you have chosen option A, you will receive the specified amount.

If you have chosen option B, a draw of cards decides about your payment.

3. The draw of cards will proceed as follows: First I will ask you to choose a deck of cards.
【Interviewer, show the subject the two envelopes marked “Deck 1” and “Deck 2”】 . These two decks contain different proportions of red and black cards. Secondly, when you have chosen a deck, I will ask you to draw a card from this deck. If the color of the card is red you will receive the high payoff; if it is black you will receive the low payoff.
4. Do you have any questions **【Interviewer, answer the questions until you are sure that the subject understands.】**
5. Please fill in the A1-form (or A2-form).

6. **【Interviewer, please look at the questionnaire, if you see that the subject has chosen the same option for all decisions or made some suspected mistakes such as switching in the “wrong” order (i.e., from B to A) explain again. If this is the case】**

May I explain to you again?

[If you have offered additional explanation, mark Yes in the corresponding box in the questionnaire.]

【Explanation....Be careful to point out that, compared to Option A, B gets increasingly attractive as (s)he moves down to later decisions.】

【Interviewer note, let the subjects change his/her decisions if (s)he wants, and mark the form with an “X” if the subject changed any decision. If (s)he does not want to change decision move on.】

Material: A1 or A2-form, two envelopes marked “Deck 1” and “Deck 2”, “Deck 1” contains 4 red and 6 black cards. “Deck 2” contains 3 red and 7 black cards.
--

Task R1

1. Please read the form.
2. **【Interviewer, please observe whether the subject has finished reading】** Let me explain it to you. You have read in the General Information that we will ask you to randomly select one of your decisions as the money earning decision. If any of the decisions in this task is randomly selected as the money earning decision, the payment proceeds as follows.

We will ask you to draw a card from a deck of cards that is prepared such that the probability of getting the high and low payoff is consistent with the description in the money earning decision.

3. The draw of cards will proceed as follows: **【Interviewer, show the subject the envelope marked “20”.】** We will prepare a deck of ten cards. A red card stands for the high payoff and a black card stands for the low payoff. The probability a red card would be chosen will be equal to the probability of the high payoff in the money earning decision and the probability a black card would be chosen will be equal to the probability for the low payoff in the money earning decision. We will then ask you to draw a card. If the color of the card is red you will receive the high payoff; if it is black you will receive the low payoff.

4. Do you have any questions **【Interviewer, answer the questions until you are sure that the subject understands.】**

5. Please fill in the R1-form.

6. **【Interviewer, please look at the questionnaire, if you see that the subject has chosen the same option for all decisions or made some suspected mistakes such as switching in the “wrong” order (i.e., from B to A), or chosen Option A for decision 10, explain again. If this is the case】**

May I explain to you again?

[If you have offered additional explanation, mark Yes in the corresponding box in the questionnaire.]

【Explanation....Be careful to point out that, compared to Option A, B gets increasingly attractive as (s)he moves down to later decisions.】

【Interviewer note, let the subject change his/her decisions if (s)he wants, and mark the form with an “X” if the subject changed any decision. If (s)he does not want to change decision move on.】

Material: R1 -form, Envelope marked “20” with 10 red and 10 black cards.
--

Task R2

1. Please read the form.

2. **【Interviewer, please observe whether the subject has finished reading】** Let me explain it to you. You have read in the General Information that we will ask you to randomly select one of your decisions as the money earning decision. If any of the decisions in this task is randomly selected as the money earning decision, the payment proceeds as follows.

If you have chosen option A, you will receive the specified amount.

If you have chosen option B, a draw of cards decides about your payment.

3. The draw of cards will proceed as follows: **【Interviewer, show the subject the envelope marked “20”.】** We will prepare a deck of ten cards. A red card stands for the high payoff and a black card stands for the low payoff. The probability a red card would be chosen will be equal to the probability of the high payoff in the money earning decision and the probability a black card would be chosen will be equal to the probability for the low payoff in the money earning decision. We will then ask you to draw a card. If the color of the card is red you will receive the high payoff; if it is black you will receive the low payoff.

4. Do you have any questions **【Interviewer, answer the questions until you are sure that the subject understands.】**

5. Please fill in the R2-form.

6. **【Interviewer, please look at the questionnaire, if you see that the subject has chosen the same option for all decisions or made some suspected mistakes such as switching in the “wrong” order (i.e., from B to A) or chosen Option A for decision 10, explain again. If this is the case】** May I explain to you again?

[If you have offered additional explanation, mark Yes in the corresponding box in the questionnaire.]

【Explanation....Be careful to point out that, compared to Option A, B gets increasingly attractive as (s)he moves down to later decisions.】

【Interviewer note, let the subject change his/her decisions if (s)he wants, and mark the form with an “X” if the subject changed any decision. If (s)he does not want to change decision move on.】

Material: R2 -form, Envelope marked “20” containing 10 red and 10 black cards.
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Task (T)

1. Please read the form.
2. **【Interviewer, please observe whether the subject has finished reading】** Let me explain it to you. Here is the envelope with X:s Payment decisions **【show the subject the envelope marked “X:s decisions in T” for T】** .
3. X:s decision will be revealed if any of these decisions are randomly selected as the money earning decision. If any of the decisions in this task is randomly selected as the money earning decision, the payment proceeds as follows.

If you have chosen option A, X’s payment decision decides the payoff.

If you have chosen option B, a draw of cards decides about your payment.

4. The draw will proceed as follows: **【Interviewer, Show the subject the envelope marked “20”.】** We will prepare a deck of ten cards from this envelope such that the probability of you drawing a red card will be equal to the probability of Payment I (with the higher payoff for the respondent) in the money earning decision and the probability of you drawing a black card is equal to the probability for Payment II (lower payoff for respondent) in the money earning decision. If the color of the card you have drawn is red, you will receive payoff according to Payment I (the high payoff); if it is black you will receive payoff according to Payment II (the low payoff).

5. Do you have any questions **【Interviewer, answer the questions until you are sure that the subject understands.】**

6. Please fill in the T-form.

7. **【Interviewer, please look at the questionnaire, if you see that the subject has chosen the same option for all decisions or made some suspected mistakes such as switching in the “wrong” order (i.e., from B to A), or chosen Option B for decision 1 explain again. If this is the case】** May I explain to you again?

[If you have offered additional explanation, mark Yes in the corresponding box in the questionnaire.]

【Explanation....Be careful to point out that, compared to Option A, B gets increasingly attractive as (s)he moves down to later decisions.】

【Interviewer note, let the subject change his/her decisions if (s)he wants, and mark the form with an “X” if the subject changed any decision. If (s)he does not want to change decision move on.】

Material: T -form, Envelope marked “X:s decisions in T” (containing a form with X:s decisions for T), Envelope marked “20” with 10 red and 10 black cards.
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Task (C1 and C2)

1. Please read the form.
2. **【Interviewer, please observe whether the subject has finished reading】** Let me explain it to you. You can either be paid independently of others or you can choose to compete with other co-participant(s) in C1 (C2). You will earn more if you are better in answering the questions than the co-participant(s) or earn less if you are worse than the co-participant(s).
【Interviewer, please show the subject the envelope marked “Quiz results” with results from co-participants performances】 This envelope has quiz results for other co-participants.
3. I want to explain that, at this moment, you will not be asked quiz questions. As you have read in the General Information, we will ask you to randomly select one decision as your money earning decision. If one of these decisions is randomly selected as your money earning decision, we will then ask you these questions.
4. Do you have any questions **【Interviewer, answer the questions until you are sure that the subject understands.】**
5. Please fill in the C1 or C2 -form.
6. **【Interviewer, please look at the questionnaire, if you see that the subject has chosen the same option for all decisions or made some suspected mistakes such as switching in the “wrong” order (i.e., from B to A), or chosen Option B for decision 1, or Option A for decision 10 explain again. If this is the case】**
May I explain to you again?
[If you have offered additional explanation, mark Yes in the corresponding box in the questionnaire.]
【Explanation....Be careful to point out that, compared to Option A, B gets increasingly attractive as (s)he moves down to later decisions.】
【Interviewer note, let the subjects change his/her decisions if (s)he wants, and mark the form with an “X” if the subject changed any decision. If (s)he does not want to change decision move on.】

Material: Envelope with a co-participants results marked “Quiz results”, C1 or C2 form.

Instructions to procedure after all tasks are completed:

Random selection of money earning decision:

1. Take out the deck of card from the envelope denoted “Money earning decision”.
2. Inform the subject that (s)he will now draw a card representing one decision previously made. Money will be paid according to this selected decision. Remind the subject that many decisions will result in rather small amounts of money.
3. Ask the subject to draw a card.
4. Write down the decision drawn and the option chosen on the Earnings-form.
5. Circle the money earning decision with a pen on the subject’s questionnaire. (Example: if the subject draws a card with “T4” go to Decision 4 on the T-form.) Point it out to the subject so that (s)he understands, which decision was chosen to determine the payoff and which option the respondent has selected.
6. The continuing procedure will depend on the decision drawn:

Material: Envelope marked “Money earning decisions”, Deck representing the 40 decisions marked: A1-A10, R1-R10, T1-T10, C1-C10, Earnings-form.
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--> *If an A1 or A2 decision is drawn.*

I. Look at the subject's decision at the A1 or A2 form.

- If the subject has chosen Option A for this decision, inform the subject that (s)he has chosen the secure payment and write down the sum the subject earns on the Earnings-form. Pay him/her the amount earned and fill out the receipt form.

- If the subject has chosen Option B for this decision pick out the envelopes labelled "Deck 1" and "Deck 2" and proceed as follows:

The draw for A1 and A2:

i). Ask the subject to choose a deck ("Deck 1" or "Deck 2"). Remind the participant that this draw decides about the probabilities to win either the high or low payoff.

ii) Take the chosen deck point at it and explain to the subject that if (s)he draws a red card (s)he gets the large amount 580 and if he draws a black card he gets the small amount 15.

iii) Ask the subject to draw one card from the chosen deck. Remind her/him that only one draw will be made and that there is a risk that (s)he will only earn a small amount.

iv). Ask the subject to show you the color of his card and write down on the Earnings-form if the cards was red or black.

v). Show the subject the color of the cards in the deck that was not drawn.

vi) Pay the subject and ask her/him to fill out the receipt form.

II. Thank the subject for participating.

Material: A1 or A2-form, Envelopes labeled "Deck 1" and "Deck 2". "Deck 1" contains 4 red and 6 black cards. "Deck 2" contains 3 red and 7 black cards, Earnings-form.

--> *If an R1 is drawn:*

I. Look at the subject's money earning decision at the R1 form.

- If the money earning decision is Decision 10 pay the subject the amount attached to the chosen option. Write down the sum the subject earns on the Earnings-form and ask her/him fill out the receipt form.

- For all other options on decision 1 to 9 proceed as follows:

i) Prepare a deck of cards containing 10 cards from the envelope marked "20". The number of red cards in the deck should correspond to the probability of the higher amount described in the money earning decision. The number of black cards should correspond to the probability of getting the small amount. Examples:

If R3 is chosen and if Option B is chosen so that the probability for winning 580 CNY and 15 CNY is 30% and 70%, respectively, prepare a deck with three red cards and seven black cards.

If R6 is chosen and if Option A is chosen so that the probability for winning 300 CNY and 240 CNY is 60% and 40%, respectively, prepare a deck with six red cards and four black cards.

ii) Explain to the subject that if he draws a red card (s)he gets the larger amount and if he draws a black card he gets the smaller amount.

iii) Reshuffle the cards so that it is not possible for the subject to find out or see the color of the cards.

iv) Ask the subject to draw one card from the prepared deck. Remind her/him that only one draw will be made and that there is a risk that (s)he will only earn a small amount.

v). Ask the subject to show you the color of his card and write down on the Earnings-form whether the cards was red or black.

vi). Show the subject the color of the cards in the deck that was not drawn.

vii) Pay the subject, write down the sum the subject earns on the Earnings-form and ask her/him fill out the receipt form.

II. Thank the subject for participating.

Material: R1-form, envelope to deck of cards labeled "20" (containing 10 red and 10 black cards) , Earnings-form.

--> *If an R2 is drawn:*

I. Look at the subject's money earning decision at the R2 form.

- If the subject has chosen Option A, inform the subject that (s)he has chosen the secure payment and write down the sum the subject earns on the Earnings-form. Pay him/her the amount earned and fill out the receipt form.

- If the money earning decision is Decision 10 pay the subject the amount attached to the chosen option (90 CNY for option A; 580 CNY for option B). Write down the sum the subject earns on the Earnings-form. Pay him/her the amount earned and fill out the receipt form.

- If the subject has chosen Option B on decision 1 to 9 proceed as follows:

i) Prepare a deck of cards containing 10 cards from the envelope marked "20". The number of red cards in the deck should correspond to the probability of the higher amount described in the money earning decision. The number of black cards should correspond to the probability of getting the small amount. Examples:

If R3 is chosen and if Option B is chosen so that the probability for winning 580 CNY and 15 CNY is 30% and 70%, respectively, prepare a deck with three red cards and seven black cards.

ii) Explain to the subject that if he draws a red card (s)he gets the larger amount and if he draws a black card he gets the smaller amount.

iii) Reshuffle the cards so that it is not possible for the subject to find out or see the color of the cards.

iv) Ask the subject to draw one card from the prepared deck. Remind her/him that only one draw will be made and that there is a risk that (s)he will only earn a small amount.

v). Ask the subject to show you the color of his card and write down on the Earnings-form if the cards was red or black.

vi). Show the subject the color of the cards in the deck that was not drawn.

vii) Write down the sum the subject earns on the Earnings-form. Pay the subject and ask her/him fill out the receipt form.

II. Thank the subject for participating.

Material: R2-form, envelope to deck of cards labeled "20" (containing 10 red and 10 black cards) , Earnings-form.

--> *If a T decision is drawn:*

I. Look at the subject's decision at the T form.

II. Take out X:s decision sheet ("X:s decision in T" for T). Show it to the subject and look up, which decision X made in the money earning decision. Point at the decision made by X and show it to the subject.

- If the subject chose Option A and X chose Payment I, inform the subject that (s)he did earn the large amount of 580 CNY.

- If the subject chose Option A and X chose Payment II, inform the subject that regretfully (s)he did only earn the small amount of 15 CNY.

- If the subject chose Option B and the money earning decision is 1, inform the subject that (s)he has earned 15 CNY. Write down the sum the subject earns on the Earnings-form. Pay him/her the amount earned and fill out the receipt form.

- If the subject chose Option B and the money earning decision is 2-10, pick out the deck of cards in the envelope marked "20" and proceed as follows:

i) Prepare a deck of cards containing 10 cards. The number of red cards in the deck should correspond to the probability of Payment I described in the money earning decision. The number of black cards should correspond to the probability of getting the small amount. Examples: If T3 is chosen and if Option B is chosen so that the probability for Payment I and Payment II is 20% and 80%, respectively, prepare a deck with two red cards and eight black cards.

ii) Explain to the subject that if he draws a red card (s)he gets Payment I (and the larger amount) and if he draws a black card he gets Payment II (the smaller amount).

iii) Reshuffle the cards so that it is not possible for the subject to find out or see the color of the cards.

iv) Ask the subject to draw one card from the prepared deck. Remind her/him that only one draw will be made and that there is a risk that (s)he will only earn a small amount.

v). Ask the subject to show you the color of his card and write down on the Earnings-form if the cards was red or black.

vi). Show the subject the color of the cards in the deck that was not drawn.

vii) Write down the sum the subject earns on the Earnings-form. Pay the subject and ask her/him fill out the receipt form.

III. Thank the subject for participating.

Material: T -form, Envelope marked "X:s decisions in T" (containing a form with X:s decisions for T), Envelope marked "20" with 10 red and 10 black cards, Earnings-form.

--> *If a C1 or C2 decision is drawn:*

. Look at the subject's decision at the C1 or C2-form.

II. Take out the Quiz-form. Inform the subject that you will ask 10 quiz questions where the respondent is asked whether the stated information is correct or false. Inform the subject that the more questions that are correctly answered the more he earns.

III. Ask the subject the quiz questions and mark each question (s)he is correct in the Quiz-form

IV. When the subject has finished. Count the number of correct answers and write down this number on the Earnings-form.

V. Determine the earnings. This depends on the Option chosen by the subject:

-If Option A is chosen, multiply the number of correct answer by the amount earned per correct number in the money earning task (5-50) and write down this number on the Earnings-form (amount earned).

- If Option B is chosen. Take out the envelope marked "Quiz results" and let the subject draw one (in the case of C1) or three (in the case of C2) co-participant(s) result(s).

-If the subject has the best result (subject answered more questions correctly than any of the co-participant(s)), multiply the number of correct answers by 50 and write down this number on the Earnings-form (amount earned).

- If at least one co-participant has a better result multiply the number of correct answers by 5 and write down this number on the Earnings-form (amount earned).

-If the subject has the same result as his co-player (C1) or as the best one of his co-players (C2). Inform the subject that in this case it will randomly determined if he will earn 5 or 50 per correctly answered question. Take out envelope marked "20". Inform the subject that there are 10 black and 10 red cards in the deck. Reshuffle. Inform the subject that (s)he will earn 5 per correct question if (s)he draws a black card and 50 if (s)he draws a red card. Ask the subject to draw one card from the deck. Remind her/him that only one draw will be made. Ask the subject to show you the color of his card and write it down on the Earnings-form if the card was red or black.

-If black card, multiply the number of correct answers by 5 and write down this number on the Earnings-form (amount earned).

-If red card, multiply the number of correct answers by 50 and write down this number on the Earnings-form (amount earned).

VI) Pay the subject and ask her/him fill out the receipt form.

VII). Thank the subject for participating.

Material: Earnings-form, Quiz-form, Envelope marked "Quiz results", C1 or C2-form, Envelope marked "20" with 10 red and 10 black cards.