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Risk Preferences in China — Results from Experimental Economics*

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Summary
The propensity to take risks is a fundamental trait that determines the nature of decision making. For example, risk taking is regarded as an important driver of entrepreneurial and innovative behavior in an economy. In this paper, we survey the empirical evidence on individual risk-taking behavior in China. We focus on those studies that elicit preferences for risk taking involving real monetary stakes under controlled conditions, using the methods of Experimental Economics. The studies that we summarize compare Chinese subjects to those in other countries. While non-incentivized surveys find that Chinese subjects are more willing to take risks than Germans and Americans are, the existing experimental studies suggest that this relationship is less clear cut.

Keywords: Experimental Economics, risk preferences, China, survey, cross-cultural experiments

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Introduction

For economists, the taste for risk is a fundamental human trait that characterizes individual decisions taken under uncertainty. The attitude toward risk is decisive in many economic models, explaining, for example, educational choice, household savings, or health-related behavior (e. g. Bonin et al. 2007; Noussair et al. 2014; Felder and Mayrhofer 2011). When explaining regional differences in economic outcomes based on microeconomic models, it is therefore important to know whether local preferences differ with respect to risk. In China, risk taking is necessary for entrepreneurs and innovators to cope with the country's transition — as pointed out by Tan (2001). Risk taking is also considered a driver of innovation and entrepreneurship in general (see Khilstrom and Laffont 1979 for a classical model, and Åstebro, et al. 2014 for a summary of empirical evidence from Behavioral Economics).

Chinese people have been found to behave differently from those in Western countries in their strategic interactions with others (e. g. Hennig-Schmidt et al. 2008; Hennig-Schmidt and Walkowitz 2016). In this paper we ask whether Chinese people also differ systematically from those in other countries with respect to individual decision making. We focus specifically on their risk attitudes, and review evidence collected under controlled conditions using the tools of Experimental Economics. Nowadays, experimental methods are used by many micro- and macroeconomists. As Guala (2012) summarizes, the key idea of experimentation is the observation of events under controlled conditions. Control not only concerns variables that are changed by the experimenter but also the background conditions. More specifically, in Experimental Economics the background conditions are partly controlled by running the experiment in a laboratory — which allows decisions to be observed while controlling communication, anonymity, and incentives. Following Roth (1995), the aims of conducting experiments can be loosely classified into testing economic theories, observing regularities in human behavior, and generating policy advice by testing economic institutions.

Testing theories was the most common aim of early experimental economics research — and it still is today. The laboratory allows the creation of decision situations that closely follow theoretical models; observed decisions can then be contrasted with theoretical predictions. Experiments that aim to uncover patterns in human behavior are closely linked to work on testing theories: Experiments can guide the development of theories in situations for which no theories exist yet, or they can stimulate the development of new theories that are better at explaining observed behavior. The work by Kahneman and Tversky (1979, cf. Section 2) on decision making under uncertainty that led to the development of Prospect Theory may be the most prominent example hereof. Experiments that aim to inform policymakers, for example by comparing different market institutions, were pioneered by Smith (1991). These experiments are commonly applied in market

design, and have been used to study several institutions implemented in real-world markets — such as online auctions (e. g. Ockenfels et al. 2006; Brosig-Koch and Heinrich 2014), spectrum auctions (e. g. Grimm, et al. 2003; Abbink et al. 2005), and entry-level labor markets (e. g. Kagel and Roth 2000; Roth, 2002).

Recently, economic experiments have also been used to compare the behavior of different subject pools in different locations. The main contribution of our own paper is a systematic review of those experimental studies that compare the risk attitudes of Chinese people to those of inhabitants of other countries. As an additional contribution, we review different approaches to conducting cross-regional experiments.

Our paper proceeds as follows: In the next section, we describe some of the methods that are used to elicit risk preferences in experimental economics research. In the third section, we then explain the challenges of collecting comparable data in multiple locations and summarize the results of existing studies and their attempts to create comparability. The fourth section concludes the paper with a discussion of limitations and future research.

Measuring risk preferences

An iconic example of decision making under risk is the Saint Petersburg paradox. Consider a gamble that is based on a series of coin throws. If the coin comes up heads on the first throw, you earn one euro and the game ends. If it comes up tails on the first throw, the stakes are doubled and you earn two euros should it come up heads on the second throw. Should it come up tails, the stakes are doubled again and you earn four euros if it comes up heads, and so on. This gamble has an expected value of infinity. Therefore, if you maximize expected payoffs you should be willing to pay a lot of money for being allowed to play the game. Yet few people would actually do so.

Bernoulli (1738) proposed a solution for this paradox and suggested that people maximize “moral expectation” and not expected payoffs. He suggested that the marginal value of money is decreasing, meaning that a wealthy person values an additional income of one euro much less than a poor person values the same amount. If people derive utility from money, this can be expressed by maximizing a utility function that is increasing in monetary value but has a decreasing slope. This kind of concave utility function implies risk aversion. For example, consider a lottery that either pays zero or ten euros with equal probability. Risk-averse people who own a ticket for this lottery will be willing to sell it for any price above five euros (the expected value). But because they are risk averse and the slope of their utility is diminishing then they will also accept a price below five euros for the ticket. How far below five euros, however, depends on the degree of risk aversion and the curvature of their utility function. In their seminal work, von Neumann and Morgenstern (1944) showed that preferences obeying a set of simple axioms could

be expressed by maximizing a utility function of this kind (and of many other kinds too).

These authors' expected utility framework is still dominant and used in many economic models today, even though it cannot explain some behavioral patterns that have been observed when people choose between different lotteries.[1] Allais (1953) was one of the first who pointed out systematic violations of the independence axiom of expected utility. Consider three lotteries A, B, and C. The independence axiom states that lottery A is preferred to lottery B if and only if pA+(1-p)C is preferred to pB+(1-p)C, where p is a probability between 0 and 1. In other words, making lotteries A and B each part of a new compound lottery by adding the same uncertainty should not alter their relative value to the decision maker. Yet as Allais (1953) demonstrated, it often does. Another prominent violation of the theory is the observation that experimental subjects exhibit preference reversals over identical lotteries depending on whether they can sell or buy these lotteries (Lichtenstein and Slovic 1971; Lindman 1971).

Kahneman and Tversky (1979) proposed Prospect Theory, which is consistent with many of these behavioral patterns. It models people as valuing outcomes relative to a given reference point. Gains relative to this reference point are valued with an increasing concave value function, while losses are valued with an increasing convex one — in other words people are viewed as risk-averse with respect to gains, but risk-seeking with respect to losses. In addition, probabilities are weighed non-objectively — meaning small probabilities are overweighed, and large ones underweighed. Prospect Theory is able to capture many deviations from Expected Utility Theory but it also has more degrees of freedom. For this reason, many economists still prefer the more parsimonious Expected Utility Theory.

Despite different theoretical approaches in modeling behavior under uncertainty, experimentally elicited risk preferences are widely used to explain behavior in other decision-making situations. There is some evidence that they are predictive of field behavior. Anderson and Mellor (2008) observe that subjects who are more risk seeking in an experiment are also more likely to smoke cigarettes, drink heavily, to be overweight, and to not use seatbelts. Noussair et al. (2014) find risk preferences to be predictive of decision making with respect to the savings and portfolio choices of households. In addition, the answers to experimentally validated survey questions

1 It is important to note that decision makers (outside of casinos) seldom know the exact probabilities of outcomes, as assumed in Expected Utility Theory (e.g. Knight, 1921). An early extension of Expected Utility Theory is Subjective Expected Utility Theory by Savage (1954), which does not rely on objectively known probabilities. It assumes people evaluate outcomes objectively, but models probabilities as being based on subjective evaluation. This theory is more widely applicable, but suffers from similar shortcomings (see the classical study by Ellsberg, 1961). To our knowledge, there are only two studies that compare risk preferences over lotteries with unknown probabilities between citizens of China and of other countries (see Vieider et al. 2015a; Vieider et al. 2015b).

about self-assessed risk attitudes have been found to be associated with field behavior. Jaeger et al. (2010) observe those who are more risk seeking to be more likely to migrate. Bonin et al. (2007) find those who are more risk seeking to be more likely to work in occupations with a high income-related risk. But the evidence is not clear cut. Sutter et al. (2013), for example, only find a negative correlation of risk aversion with body mass index but no significant correlation with savings behavior, smoking, or alcohol consumption in adolescents.

Risk preferences can be measured with a variety of experimental procedures. In the following, we will briefly describe three popular methods that have been used in the papers that we survey. Our description is based on the overviews provided by Harrison and Rutström (2008) and Charness et al. (2013).

Multiple price list

The multiple price list (MPL) is one of the most commonly used such methods. Most prominent herein is the version by Holt and Laury (2002), but, according to Harrison and Rutström (2008), the very first to use this mechanism were Miller et al. (1969). Table 1 below shows the original price list by Holt and Laury (2002). Subjects typically face a list of two binary lotteries. In each row of the list they choose the lottery that they prefer, and one of the rows is randomly chosen and played to determine their payoff.

The payoffs from the outcomes of the lotteries remain the same between rows, but their probabilities change. The payoffs on the left (Option A) have a lower spread than those on the right (Option B). Moving down from row to row, the probability of the larger outcome within each lottery increases while the probability of the smaller outcome decreases. This makes the righthand side option more attractive in terms of expected payoff when moving down the table (see the rightmost column). From the fifth row on, it is more attractive for someone who is indifferent with respect to risk to choose Option B. Because the spreads differ between the lotteries of both options, however, some people might switch earlier and some later — depending on their taste for risk. In fact, those who switch before the fifth row can be considered “risk seeking” and those who switch later as “risk averse.” The resulting switching point gives the experimenter an estimate of an individual’s attitude towards risk. Note, however, that a subject may behave inconsistently and switch multiple times. Another problem is that the price list induces subjects to switch in the middle of the table, as Harrison and Rutström (2008) point out (see Ebert and Wiesen 2014, and Heinrich and Mayrhofer 2014 for examples).

Table 1. MPL by Holt and Laury (2002)

Row	Option A	Option B	Expected payoff difference
1	1/10 of $2.00, 9/10 of $1.60	1/10 of $3.85, 9/10 of $0.10	$1.17
2	2/10 of $2.00, 8/10 of $1.60	2/10 of $3.85, 8/10 of $0.10	$0.83
3	3/10 of $2.00, 7/10 of $1.60	3/10 of $3.85, 7/10 of $0.10	$0.50
4	4/10 of $2.00, 6/10 of $1.60	4/10 of $3.85, 6/10 of $0.10	$0.16
5	5/10 of $2.00, 5/10 of $1.60	5/10 of $3.85, 5/10 of $0.10	-$0.18
6	6/10 of $2.00, 4/10 of $1.60	6/10 of $3.85, 4/10 of $0.10	-$0.51
7	7/10 of $2.00, 3/10 of $1.60	7/10 of $3.85, 3/10 of $0.10	-$0.85
8	8/10 of $2.00, 2/10 of $1.60	8/10 of $3.85, 2/10 of $0.10	-$1.18
9	9/10 of $2.00, 1/10 of $1.60	9/10 of $3.85, 1/10 of $0.10	-$1.52
10	10/10 of $2.00, 0/10 of $1.60	10/10 of $3.85, 0/10 of $0.10	-$1.85

In some versions of the MPL, one of the two options is a degenerate lottery with certain payoffs (see Schubert et al. 1999 for an early example). In the following, we denote this elicitation method as “MPL-1L” (because it only contains one nondegenerate lottery in each choice) and the standard Holt and Laury (2002) version as “MPL-2L” (because it contains two nondegenerate lotteries in each choice).

Random lottery pairs

The random lottery pairs (RLP) procedure presents subjects with a series of choices over two lotteries. In each choice they express their preference for one of the two lotteries, or, in some procedures, indifference. One of these choices is then selected randomly to determine the payoff. A prominent example is the study by Hey and Orme (1994). They confront subjects with a pair of two-outcome lotteries in each choice. The potential outcomes are taken from the set £0, £10, £20, and £30. The probabilities vary across lotteries and are displayed visually in a pie chart. This approach is very easy to understand, but it does not yield a clear-cut measure for attitude towards risk — as the switching point in the MPL does. As Harrison and Rutström (2008) point out, some form of statistical estimation is thus needed.

Figure 1. Lottery pair by Deck and Schlesinger (2014)

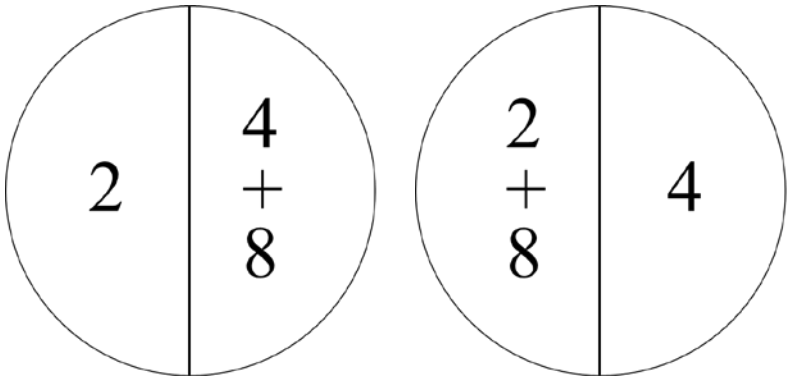

Figure 1 gives an example from the random lottery pairs developed by Deck and Schlesinger (2014), which are also used in the cross-regional comparison by Haering et al. (2017) described in the following section. Similar to Hey and Orne (1994), the probabilities are displayed in a pie chart. Different from their work, however, the random lottery pairs by Deck and Schlesinger (2014) used to elicit risk-averse or risk-seeking choices are all 50–50 lotteries — that is, all outcomes are equally likely.[2] Both lotteries have an expected value of 7 but the outcomes of the lottery on the left (2 and 12) have a larger spread than those on the right (10 and 4). This means that while a risk-neutral individual would be indifferent between both lotteries, every risk-averse person should in principle select the lottery on the right.

Becker-DeGroot-Marschak mechanism

The mechanism suggested by Becker et al. (1964) (BDM) can be used to elicit subjects' certainty equivalents for lotteries, meaning the amount that a subject has to receive with a probability of 100 percent to be willing to sell a lottery ticket that they own. This is a measure for risk attitude. A risk-averse subject will accept a price below the expected value. The more risk averse that they are, the lower this price will be. The mechanism works as follows: The subject owns a lottery and is informed about its characteristics. They also learn that a price for the lottery is picked at random, and that they can state the threshold at which they are willing to

2 The lottery pairs by Deck and Schlesinger (2014) also include lotteries to measure higher-order risk preferences like prudence and temperance, done by combining several 50–50 lotteries. Prudent individuals save more when their future income becomes more risky, while temperate individuals invest less in risky assets when their future income becomes more risky (Kimball, 1990, 1993). Because in other decision pairs the outcomes of different lotteries are added up, for consistency the addition of payoffs (4+8 and 2+8) is also used in the simple lottery that is displayed in Figure 1.

sell. If the price is above that threshold, the lottery will be sold at that price and they will be paid accordingly. If the price is below or equal to the threshold, the subject keeps the lottery and plays it. This mechanism is theoretically incentive compatible, meaning a subject will state their true threshold because they cannot gain from misstating it. Yet this logic is not always apparent. In order to pick the true threshold, one has to realize that the final selling price does not actually depend on the originally stated threshold (for recent criticism, see Cason and Plott, 2014).

Risk preferences in China

Control in cross-regional experiments

At first glance, conducting the same experiment in different regions, countries, or cultures appears a simple way to learn about behavioral differences. However, great care has to be taken to conduct experiments in a comparable way. Roth et al. (1991) ran bargaining and market experiments in Jerusalem, Ljubljana, Pittsburg, and Tokyo. They were among the first to systematically address the following confounding effects that can render observations incomparable:

Experimenter effects: If experiments in different locations are conducted by different experimenters, these experimenters or differences in their procedures might influence decisions differently. Roth et al. (1991) defined the detailed operational procedures that were followed by all experimenters. In addition, all experimenters conducted experiments in Pittsburg in order to detect pure experimenter effects.

Language effects: If languages differ across locations, it becomes necessary to translate the experiment instructions. Literal translations are usually impossible because certain words may not exist in all languages or they may differ in their connotations, which might influence behavior. Roth et al. (1991) aimed to write the original English-language instructions in terms that could be faithfully translated into other languages, "avoiding terms with heavy or ambiguous connotations" (p. 1072). Because they ran two treatments in each country, they had some additional control because — if present — a translation effect would have been observed in both. More commonly used is the back-translation procedure (Brislin 1970). In the first step, the instructions in the original language are translated into another one by a translator. In the second step, this translation is then independently translated back into the original language by a different translator. In the third step, the original and back-translated instructions are compared in order to identify and resolve any discrepancies therein.

Currency effects: Subjects in economic experiments are paid real money in order to provide salient incentives (Smith 1976). If subjects are paid in their local currency, country differences might be due to differences in the incentives that these payments provide. Or, they might be due to the different scales — for example if subjects prefer round numbers. To address the first problem, Roth et al. (1991) adjusted

payment amounts based on purchasing power in the respective countries. To address the second problem, they used "experimental currency units" — in other words, subjects in every country decided on the basis of the same number of tokens. These tokens are converted back to local currency only at the very end, when subjects are paid.

Based on the study by Roth et al. (1991), Herrmann et al. (2008a, 2008b) provide a detailed discussion of these effects and of additional measures to counteract them. For example, with respect to experimenter effects, they also highlight the importance of ensuring subjects' anonymity and of limiting their interaction with the experimenter by conducting a computerized experiment. All the effects mentioned are concerned with the procedures of the experiment itself. Even after these problems have been addressed, however, subjects are not randomly assigned to locations — as that would mean being assigned to different treatments of the same regular experiment. Differences in behavior can be due to all sorts of differences between the subject pools in different locations. Of course, it is impossible to find two subject pools that differ only with respect to their cultural background or country of origin. Therefore, Roth et al. (1991) are careful enough to suggest only that "different behavior in the different subject pools can *cautiously* be used as the basis for *preliminary conjectures* about cultural differences" (p. 1068, emphasis added).

An additional control that has been recently applied is to conduct experiments in (at least) two locations within each region. This way, differences within regions can be compared to those between regions (see Ehmke et al. 2010; and Vieider et al. 2015a). However, this approach does not help if a confounding factor is present in each and every location of a region (e.g. if recruitment procedures for subjects differ between countries for legal reasons).

Nevertheless, carefully designed experiments with hypotheses based on regional differences have discovered interesting behavioral differences across regions. Ockenfels and Weimann (1999), for example, capitalized on German reunification to conduct experiments in the east and west of Germany. Using the same language and currency, they still found pronounced behavioral differences in two regions that had been governed by opposing political systems. They found eastern subjects to behave more selfishly in anonymous laboratory settings.[3] To explain their findings, the authors argue that growing up in a socialist system may have led to solidarity and cooperative behavior in small non-anonymous groups and to egoism in large anonymous ones.

3 See also the follow-up study by Brosig-Koch et al. (2011), which was conducted 20 years after German reunification.

Henrich et al. (2005), meanwhile, conducted ultimatum, public good, and dictator game experiments in 15 small-scale societies around the world. They observed considerable heterogeneity in behavior across these societies. They reported evidence that regional differences in behavior within the societies under study are associated with differences in market integration and the payoffs from cooperation in everyday life.

Comparison of studies

To shed light on risk preferences in the People's Republic of China in comparison to in other countries, we conduct a systematic literature survey. We searched for studies that elicit risk preferences in China and in at least one other region. We only considered experimental studies, meaning those that comply with the standards of Experimental Economics. The main features hereof (in comparison to experimental research in Psychology) are the mandatory use of monetary incentives (Smith, 1976) and the ban on deliberately deceiving subjects (Ortmann and Hertwig, 2002). In addition, we only include those studies that perform statistical tests on the differences between countries.[4]

Table 2 below summarizes, at the top, the six experimental papers that fit our criteria. In addition, at the bottom we list four prominent papers employing a survey methodology (QUE) — in other words, these studies do not elicit decisions over lotteries with real monetary outcomes but ask subjects to make hypothetical decisions in a questionnaire. The first two studies (Weber and Hsee, 1998, and Hsee and Weber, 1999) were the first to focus on Chinese risk preferences. The latter two are, to the best of our knowledge, the most comprehensive survey studies on global differences with respect to risk attitudes. Regarding our research question, their findings exemplify the evidence from other surveys. The remaining surveys we found (Brumagim and Xianhua, 2005, Fan and Xiao, 2006, Lau and Ranyard, 2005, and Statman, 2008) all report the Chinese to be less risk averse than people from other countries are.

4 We used Google Scholar (http://scholar.google.com) and Ideas (http://ideas.repec.org) for a keyword search in order to identify relevant studies in the first round of filtering. The following keywords were used: risk China; risk Chinese; risk preferences China; risk preferences Chinese; risk behavior China; risk behavior Chinese; risk tolerance China; risk tolerance Chinese; Risikopräferenzen China; risk assessment China; risk cross-cultural; cross-cultural risk China; risk cross-country; risk preference cross-country; risk preference cross-country China; risk perception; cross-cultural risk; risk cross-cultural China; and, cross-cultural risk preferences. This resulted in a huge number of studies being discovered. In a second round of filtering, we focused on those studies that compare China with at least one other country. In a third step, we focused on those studies using the methods of Experimental Economics. In the final step, we excluded two studies that did not statistically compare results between countries (Bohnet et al. 2008; Bruhin et al. 2010). We nevertheless discuss these two in due course.

The second column of Table 2 below lists the countries compared in the respective studies. It makes clear that the United States is the most common reference point, followed by Germany. We therefore focus on Germany and the US in the following. The next three columns list the measures taken to ensure the comparability of data collection across locations with respect to the effects pointed out by Roth et al. (1991). The comparisons reveal near consensus with respect to language effects: of the nine studies conducted in different languages, eight use the back-translation method (Brislin 1970). Despite the drawbacks mentioned by Roth et al. (1991), eight out of ten studies opt to display varying payoffs in local currency instead of in experimental currency. This saves subjects from calculating actual payoffs and might make payoffs more salient, but it also potentially creates confounding scale effects. Nine out of ten studies also report how they converted payoffs between countries. All studies use measures that reflect the income differences between the respective subjective pools. However, there appears to be no consensus on the reference measure: some studies use the country-based purchasing power parity (PPP) measure while others rely on more local measures, such as the wages of student research assistants.

With respect to potential experimenter effects, there appears to be even more heterogeneity. Only four out of nine relevant studies actually mention the approach taken. All of these studies relied on the support of local researchers or interpreters. Those by Haering et al. (2017), Rieger et al. (2014), and Falk et al. (2015) also relied on standardized protocols. Haering et al. (2017) are the only ones to control for experimenter differences, by additionally having all experimenters conduct one session in the same location — as advocated by Roth et al. (1991).

In addition, Table 2 lists the general parameters of the studies that we survey. These use different elicitation methods, different sample sizes, and different control variables to capture subject pool differences. There is considerable heterogeneity with respect to the control variables. Ideally, researchers would include many demographic controls to exclude confounding subject pool differences when looking for cross-regional differences in behavior. Yet this also requires larger samples, creating additional costs.

The last two columns of Table 2 summarize the results. The “Risk aversion” one lists significant differences between regions, while the “Other” column lists additional findings. Let us consider the survey papers first, as this methodology has been the standard approach used by economists and other social scientists to assess risk attitudes for many years now. The three survey studies that compare China directly to other countries find Chinese people to be less risk averse than Germans and Americans are. In this respect, they are similar to other surveys not included in Table 2 (Brumagim and Xianhua 2005; Fan and Xiao 2006; Lau and Ranyard, 2005, and Statman 2008).

The fourth mentioned survey study was recently conducted by Falk, Becker, et al. (2015). It is the first study to assess risk preferences (as well as other characteristics of human decision making) in representative samples using an experimentally validated survey measure. This means that the authors also conducted another study (as described in Falk et al. 2016) in which survey answers were compared to the choices made with real monetary stakes by the same subjects. This allows for the selection of survey questions that are highly correlated with the choices made when actual money is involved.

The drawback of their approach is that the cross-regional comparison of risk preferences is only valid if the correlation between imagined and real choices is similar across regions. Vieder et al. (2015b) find that the correlation between survey questions and incentivized measures in fact varies across countries. As they point out, the correlation is significantly positive in 19 to 29 of the 30 countries that they cover (depending on the question and on the domain of payoffs). This might explain why survey questions have been found to correlate with experimentally elicited measures of risk aversion by some (Dohmen et al. 2011 and Falk et al. 2016) but not all authors (Anderson and Mellor, 2009, Lönnqvist et al. 2011).

Falk et al. (2015) do not directly compare risk preferences across countries. Instead, they correlate the average risk attitude in 76 countries with other characteristics of these countries. They find the degree of risk aversion to be significantly and positively correlated with life expectancy, less inequality (as measured by the Gini coefficient), and the higher rigidity of employment laws. It is weakly significantly correlated with a larger level of redistribution (measured as the share of government transfers of national income) and a lower number of homicides. There is no significant correlation with gross domestic product (GDP) per capita or the degree of institutionalized democracy.[5]

Let us now consider the experimental studies that collect decisions made over real monetary stakes. Even though we list six experimental papers, the results are only drawn from five datasets — because Vieider et al. (2015a) consider a subset of the data presented in Vieider et al. (2015b). In three of the five datasets, the respective authors find differences in line with the results of the survey studies: Ehmke et al. (2010) find Chinese participants to be less risk averse than those in the French and American subject pools are. Vieider et al. (2015b) find Chinese participants to be

5 Falk et al. (2015) do not provide a direct comparison of risk preferences in China and in other countries. However, based on the correlations that they provide one can derive an ordering of risk preferences: When comparing China to the US and Germany, for example, we would expect Chinese people to be the least risk averse based on life expectancy, Gini coefficient and redistribution of GDP. Based on labor regulations and the number of homicides per capita, we would expect Americans to be the least risk averse.

less risk averse than German ones.[6] Haering et al. (2017) find Chinese participants to be less risk averse than American and German ones. However, in the remaining two experimental datasets (Kachelmeier and Shehata 1992, and Liu, Meng, et al. 2014), the authors find no significant differences between locations. These results make clear that Chinese participants *cannot* be unequivocally regarded as less risk averse than German and American ones, as the previous survey evidence suggests. These findings also highlight that more research is needed to analyze why hypothetical decisions differ from real ones in a variety of ways across countries.[7]

Two further studies have experimentally elicited risk preferences in China and in other countries but are not listed in Table 2. Bohnet et al. (2008), on the one hand, compare the attitude toward risk in situations where nature resolves uncertainty to the attitude toward risk in situations in which another person resolves it. They find people in Brazil, China, Oman, Switzerland, Turkey and the US to be "betrayal averse", meaning that they prefer risks in which uncertainty is resolved by nature. They also elicit risk preferences in each country, but do not compare them directly. They compare each country to the sample mean, finding only subjects in Oman to be more risk averse than the average. Bruhin et al. (2010), on the other hand, conduct experiments in two locations in Switzerland and two in China. They are interested in identifying behavioral types, so they do not directly compare risk attitudes between countries or between locations. In both countries they find that roughly 80 percent of subjects can be classified as behaving consistent with Prospect Theory, while the remaining subjects maximize expected values. However, they point out that some of the Prospect Theory-type subjects in China strongly overweigh gain and underweigh loss probabilities — which could explain a general tendency to be less risk averse.

6 In the case of lotteries with unknown probabilities (cf. Footnote 1), Vieider et al. (2015b, online appendix) find Chinese people to be less risk averse than both Americans *and* Germans.

7 Also note that Vieider et al. (2015a) report only very small within-country differences in China and in Ethiopia, while Ehmke, Lusk and Tyner (2010) make a similar observation in the US.

Table 2. Comparison of studies

Study	Comparison countries[1]	Cross-regional controls				Elicitation method[2]
		Experimenter	Language	Currency display	Currency conversion[3]	
Kachelmeier & Shehata (1992)	CA, US	Assistance by local interpreter	Back translation	Local currency	n/a	BDM
Ehmke et al. (2010)	FR, NE, US	n/a	Back translation	Local currency	PPP	MPL-2L
Liu et al. (2014)	TW	Not required	Not required	Experimental currency	Wage of a student research assistant	MPL-2L
Vieider et al. (2015b)	DE, US, & 42 others	n/a	Back translation	Local currency	Wage of a student research assistant, PPP adjusted	MPL-1L
Vieider et al. (2015a)	ET	n/a	Back translation	Local currency	Wage of a student research assistant, PPP adjusted	MPL-1L
Haering et al. (2017)	DE, US	Detailed protocol, local experimenters, supervising experimenter	Back translation	Experimental currency	PPP, UBS, adjusted by local guidelines for subject payment	RLP
Weber & Hsee (1998)	DE, PL, US	n/a	Back translation	Local currency	Expenses of students	QUE
Hsee & Weber (1999)	US	n/a	Back translation	Local currency	Expenses of students	QUE
Rieger et al. (2014)	DE, US, & 50 others	Standardized oral introductions read aloud by the local lecturer	Translated by professional translators or translators with an economics background	Local currency	Income and expenses of students, PPP adjusted	QUE
Falk et al. (2015)	DE, US, & 73 others	Professional interviewers using a standardized procedure across Countries	Back translation	Local currency	Median household income	QUE

1: CA: Canada; CN: People's Republic of China; DE: Germany; ET: Ethiopia; FR: France; NE: Niger; PL: Poland; TW: Taiwan; US: United States of America.

2: BDM: Becker-DeGroot-Marschak; MPL-1L: Multiple Price List one lottery; MPL-2L: Multiple Price List two lotteries; QUE: Questionnaires, RLP: Random Lottery Pairs.

3: BNT: Berlin Numeracy Test; CRT: Cognitive Reflection Test; Econ: Economics; IRB form: In the US, subjects need to be presented with a form by the Institutional Review Board for experiments with human subjects beforehand; Math: Mathematics; Major: Major field of study; Stats: Statistics; UBS Prices & Earnings 2014, available online at: www.ubs.com/pricesandearnings.

Table 2. (continued)

	Subject Pool		Results	
Study	Country: Location or University (*N*)[1]	Control variables[3]	Risk aversion[1]	Other
Kachelmeier & Shehata (1992)	CN: Beijing Univ. (40) CA: "Medium sized university" (32) US: "Large university" (28)	None	No significant differences.	Subjects in China are more risk averse when monetary payoffs are increased tenfold
Ehmke et al. (2010)	CN: Hangzhou (96), FR: Grenoble (70), US: West Lafayette (63), Manhattan (57), NE: Niamey (60)	Gender	CN & NE < FR & US	Within-country differences in risk preferences are small
Liu et al. (2014)	CN: Beijing Univ. (185), TW: National Taiwan Univ. (195)	Gender, age, graduate student, major, conservative upbringing, father's education, mother's education	No significant differences.	Beijing University students become significantly more risk loving after being primed with Confucianism
Vieider et al. (2015b)	31 universities in 30 countries (2,939)	Gender, age, major, GDP/capita, Gini coefficient	ET < CN < DE	Incentivized measures correlate with survey questions in a majority of countries
Vieider et al. (2015a)	CN: Jiao Tong Univ. (124), Beijing Normal Univ. (80), ET: Two campuses of Addis Ababa Univ. (83 & 62)	Gender, age, major	ET < CN	Within-country differences in risk preferences are small
Haering et al. (2017)	CN: Nankai Univ. (140), DE: Univ. of Duisburg-Essen (145), US: Harvard Business School (129)	Experimenter, gender, age, CRT score, BNT score, sum of math, stats & econ courses, IRB form	CN < US & DE	Subjects in China are more risk averse when monetary payoffs are increased tenfold
Weber & Hsee (1998)	CN: (85), DEU: (31), PO: (81), USA: (86) "Major urban universities"	Major	CN < PO < DE & US	Chinese are closer to risk neutral in pricing options
Hsee & Weber (1999)	US: Univ. of Chicago (99), Ohio State Univ. (66), CN: Chengjian Univ. (110), Jiao Tong Univ. (65)	n/a	CN < US	Chinese are more risk seeking in investments but not in medical or academic decisions
Rieger et al. (2014)	>60 universities in 53 countries (6,912)	Gender, age, GDP/capita, individualism, uncertainty avoidance index	CN < US < DE	People in richer countries are more risk averse in gains
Falk et al. (2015)	Representative samples in 76 countries (>80,000)	None	n/a	Risk aversion correlates with life expectancy, Gini coefficient, redistribution of GDP, labor regulation, and number of homicides on a country level

Conclusion

We started out with the aim of assessing the risk attitude of Chinese people in comparison to the inhabitants of other countries. Most commonly, survey studies have been used to compare risk attitudes across countries. These studies are based on choices over hypothetical stakes. Virtually all of them find a higher propensity of Chinese participants to take risks relative to American or German participants. However, in Experimental Economics we are interested in preferences over actual monetary outcomes. If we want to draw conclusions about these types of preference based on survey studies using hypothetical outcomes, we have to assume that choices over hypothetical outcomes correlate with choices over monetary ones too — but this is not always the case, as observed by Vieider et al. (2015b). When comparing answers across countries, we also have to assume that this correlation is similar.

However, with respect to China, it is not always clear that instruments for empirical data collection that have been developed in Western countries can be readily transferred to that national context (see Roy et al. 2001 and Stening and Zhang 2007 for overviews). For example, there appears to be evidence for a tendency of Chinese respondents to choose midpoints on Likert scales in questionnaires (Shenkar 1994). The experimental studies that are based on choices over real monetary stakes suggest that differences in preferences are less clear: three studies find Chinese people to be less risk averse than Germans or Americans are, while two studies find no significant differences between them.

However, not all of the studies that we cover can be readily compared because of their varying designs. For example, several reported studies display the varying payoffs in local currency which might lead to confounding scale effects. For a more extensive discussion of how differences in experimental design may account for differences in behavior, see Goerg et al. (2016). It is also possible that our comparison of studies is confounded by regional differences within countries, or by changes in risk attitudes over time. We have not focused on the last point in this paper. Yet macroeconomic conditions have been found to influence decision making under risk (e. g. Browne, Jaeger, et al. 2015, Cohn, Engelmann, et al. 2015), and these conditions have changed quite dramatically in China in recent decades. Also note that the number of experimental studies comparing the risk preferences of the Chinese to those of other peoples is relatively small. If more data becomes available, a quantitative meta-analysis would be the next step.[8]

8 In our review, we only considered individual decision making. Yet cross-regional experimental studies comparing behavior in strategic interactions in Western and Eastern countries generally observe a high degree of dissimilarity (see, for example, Oosterbeek, et al. 2004). By exploring the negotiation behavior of teams from China and Germany, for example, Hennig-Schmidt and Walkowitz (2016) observe that the latter put great weight on fairness issues and try to reach an

In general, our overview summarizes the popular design approaches taken in cross-regional experiments. It highlights the importance of general standards, such as the back-translation procedure, for the comparability of results. One method that is not widely used yet is to run experiments in different locations within the same region, as a control. This is a promising approach because it allows research to compare within-region differences to between-region ones. Due to their cost, experiments are usually restricted to small samples from student subject pools. One alternative to experimental studies are experimentally validated survey measures. These can be applied to representative samples more efficiently. However, their contribution with respect to risk preferences over real monetary stakes is based on a rather strong assumption: the validation that took place in one country is assumed to hold true within all countries under study.

Even if risk preferences are found to differ systematically between individuals or regions, little is known at present about the underlying drivers thereof. Often variations in risk preferences are attributed to cultural differences between countries. For example, Hsee and Weber (1999) found that Chinese people are more likely to take risks than Americans are when deciding over hypothetical payoffs. They explain their finding by the much lower individualism in China relative to in the US, which was also observed by Hofstede (1980). Based on the "cushion hypothesis" people from China are therefore less likely than those from the US to deal with the consequences of risky decisions on their own.

Hofstede (1980) originally identified four dimensions that characterize a culture: power distance, individualism, masculinity, and uncertainty avoidance. Uncertainty avoidance has also been reported to be associated with risk taking. A higher degree of uncertainty avoidance means that members of a society try harder to avoid situations with high uncertainties. This is not synonymous with risk aversion, however. Instead, people might also take additional risks to avoid ambiguity — that is, situations in which the probabilities of outcomes are not known. Nevertheless, in their own survey Rieger et al. (2015) observe that more uncertainty avoidance is associated with less risk taking. However, with respect to uncertainty avoidance China differs less from Western countries — for example the US ranks 57th and China 63rd out of the 69 countries that were surveyed (Hofstede et al. 2010).

It has also been observed that risk preferences are transmitted from one generation to the next (Dohmen et al. 2012), and that they are at least partly genetically determined (Cesarini et al. 2009). Quite recent observations by Becker et al. (2015) suggest that differences in risk preferences between countries (elicited through representative surveys) can be explained by genetic and migratory distance. Their

acceptable payoff within a reasonable timeframe. In contrast, teams from China try to collect as much information on their negotiation partners as possible so as to anticipate their behavior.

results also highlight the importance of environmental factors, including the prevailing institutions for the shaping of risk preferences (see also, Callen et al. 2014 and Browne et al. 2016).

Given the rapid change in living conditions as well as in the institutional environment in China, it thus remains to be seen how risk preferences develop along economic and cultural parameters there. In future, longitudinal studies that combine experiments (or experimentally validated survey measures) with representative samples will help to disentangle the different drivers of decision making under uncertainty. The observation of behavior over time could inform new theories to help explain individual decision making. As an important application, such data may also be able to help explain regional differences in innovativeness and its development.

References

Abbink, Klaus; Irlenbusch, Bernd; Pezanis-Christou, Paul; Rockenbach, Bettina; Sadrieh, Abdolkarim; Selten, Reinhard (2005): "An experimental test of design alternatives for the British 3G/UMTS auction", in: *European Economic Review*, 49: 505–530

Allais, Maurice (1953): "Le comportement de l'homme rationnel devant le risque: Critique des postulats et axiomes de l'ecole americaine", in : *Econometrica*, 21: 503–546

Anderson, Lisa R.; Mellor, Jennifer M. (2008): "Predicting health behaviors with an experimental measure of risk preference", in: *Journal of Health Economics*, 27.5: 1260–1274

— (2009): "Are risk preferences stable? Comparing an experimental measure with a validated survey-based measure", in: *Journal of Risk and Uncertainty*, 39.2: 137–160

Åstebro, Thomas; Herz, Holger; Nanda, Ramana; Weber, Roberto A. (2014): "Seeking the roots of entrepreneurship: insights from behavioral economics", in: *Journal of Economic Perspectives*, 28.3: 49–69

Becker, Anke; Enke, Benjamin; Falk, Armin (2015): "The ancient origins of the cross-country heterogeneity in risk preferences". https://www.cens.uni-bonn.de/team/board/armin-falk/falk-risk-sent.pdf (accessed 2016-03-30)

Becker, Gordon M.; DeGroot, Morris H.; Marschak, Jacob (1964): "Measuring utility by a single-response sequential method", in: *Systems Research and Behavioral Science*, 9: 226–232

Bernoulli, Daniel (1738): "Specimen theoriae novae de mensura sortis", in: *Commentarii Academiae Scientiarum Imperialis Petropolitanae*, 5: 175–192

Bohnet, Iris; Greig, Fiona; Herrmann, Benedikt; Zeckhauser, Richard (2008): "Betrayal aversion: Evidence from Brazil, China, Oman, Switzerland, Turkey, and the United States", in: *The American Economic Review*, 98.1: 294–310

Bonin, Holger; Dohmen, Thomas; Falk, Armin; Huffman, David; Sunde, Uwe (2007): "Cross-sectional earnings risk and occupational sorting: The role of risk attitudes", in: *Labour Economics*, 14.6: 926–937

Brislin, Richard W. (1970): "Back-translation for cross-cultural research", in: *Journal of Cross-Cultural Psychology*, 1.3: 185–216

Brosig-Koch, Jeannette; Helbach, Christoph; Ockenfels, Axel; Weimann, Joachim (2011): "Still different after all these years: Solidarity behavior in East and West Germany", in: *Journal of Public Economics*, 95.11: 1373–1376

Brosig-Koch, Jeannette; Heinrich, Timo (2014): "Reputation and mechanism choice in procurement auctions: An experiment", in: *Production and Operations Management*, 23.2: 210–220

Browne, Mark J.; Jaeger, Verena; Steinorth, Petra (2015): "Impact of economic conditions on individual risk attitude", SSRN 2631066

Browne, Mark J.; Jaeger, Verena; Richter, Andreas; Steinorth, Petra (2016): "Familiy transitions and risk attitude", in: *MRIC Working Paper No. 32*

Bruhin, Adrian; Fehr-Duda, Helga; Epper, Thomas (2010): "Risk and rationality: Uncovering heterogeneity in probability distortion", in: *Econometrica*, 78.4: 1375–1412

Brumagim, Alan L.; Xianhua, Wu (2005): “An examination of cross-cultural differences in attitudes towards risk: Testing prospect theory in the People's Republic of China”, in: *Multinational Business Review*, 13.3: 67–86

Callen, Michael; Isaqzadeh, Mohammad; Long, James D.; Sprenger, Charles (2014): “Violence and risk preference: Experimental evidence from Afghanistan”, in: *American Economic Review*, 104.1: 123–148

Cason, Timothy N.; Plott, Charles R. (2014): “Misconceptions and game form recognition: challenges to theories of revealed preference and framing.” *Journal of Political Economy*, 122.6: 1235–1270

Cesarini, David; Dawes, Christopher T.; Johannesson, Magnus; Lichtenstein, Paul; Wallace, Björn (2009): “Genetic variation in preferences for giving and risk taking”, in: *Quarterly Journal of Economics*, May 2009: 809–842

Charness, Gary; Gneezy, Uri; Imas, Alex (2013): “Experimental methods: Eliciting risk preferences”, in: *Journal of Economic Behavior & Organization*, 87: 43–51

Cohn, Alain; Engelmann, Jan; Fehr, Ernst; Maréchal, Michel A. (2015): “Evidence for countercyclical risk aversion: an experiment with financial professionals”, in: *American Economic Review*, 105.2: 860–885

Deck, Cary; Schlesinger, Harris (2014): “Consistency of higher order risk preferences”, in: *Econometrica*, 82.5: 1913–1943

Dohmen, Thomas; Falk, Armin; Huffman, David; Sunde, Uwe; Schupp, Jürgen; Wagner, Gert G. (2011): “Individual risk attitudes: Measurement, determinants, and behavioral consequences”, in: *Journal of the European Economic Association*, 9.3: 522–550

Dohmen, Thomas; Falk, Armin; Sunde, Uwe (2012): “The intergenerational transmission of risk and trust attitudes”, in: *Review of Economic Studies*, 72: 645–677

Ebert, Sebastian; Wiesen, Daniel (2014): “Joint measurement of risk aversion, prudence, and temperance”, in: *Journal of Risk and Uncertainty*, 48.3: 231–252

Ehmke, Mariah; Lusk, Jayson; Tyner, Wallace (2010): “Multidimensional tests for economic behavior differences across cultures”, in: *Journal of Socio-Economics*, 39.1: 37–45

Ellsberg, Daniel (1961): “Risk, ambiguity, and the Savage axioms”, in: *Quarterly Journal of Economics*, 75: 643–669

Falk, Armin, Becker, Anke, Dohmen, Thomas; Huffman, David; Sunde, Uwe (2016): “The preference survey module: A validated instrument for measuring risk, time, and social preferences.”, in: *IZA Discussion Paper (9674)*

Falk, Armin; Becker, Anke; Dohmen, Thomas; Enke, Benjamin; Huffman, David; Sunde, Uwe (2015): “The nature and predictive power of preferences: Global Evidence”, in: *IZA Discussion Paper (9504)*

Fan, Jessie X.; Xiao, Jing Jian (2006): “A cross-cultural study in risk tolerance: Comparing Chinese and Americans”, in: *Journal of Personal Finance*, 5.3: 54–75

Felder, Stefan; Mayrhofer, Thomas (2011): *Medical decision making: A health economic primer*. Heidelberg: Springer Science & Business Media

Goerg, Sebastian J.; Hennig-Schmidt, Heike; Walkowitz, Gari; Winter, Eyal (2016): “In wrong anticipation-miscalibrated beliefs between Germans, Israelis, and Palestinians”, in: *PLoS One*, 11.6, https://doi.org/10.1371/journal.pone.0156998

Grimm, Veronika; Riedel, Frank; Wolfstetter, Elmar (2003): “Low price equilibrium in multiunit auctions: The GSM spectrum auction in Germany”, in: *International Journal of Industrial Organization*, 21: 1557–1569

Guala, Francesco (2012): “Experimentation in economics”, in: Mäki, U. (ed.): *Philosophy of Economics* (Handbook of the Philosophy of Science, 13). Oxford, UK and Amsterdam: Elsevier, 597–640

Haering, Alexander; Heinrich, Timo; Mayrhofer, Thomas (2017): “Exploring the consistency of higher-order risk preferences”, in: *Ruhr Economics Papers* #688

Harrison, Glenn W.; Rutström, Elisabet E. (2008): “Risk aversion in the laboratory”, in: Cox, James C.; Harrison, Glenn W. (eds.): *Risk Aversion in Experiments* (Research in Experimental Economics, 12). Bingley: Emerald, 41–196

Heinrich, Timo; Mayrhofer, Thomas (2014): “Higher-order risk preferences in social settings”, in: *Ruhr Economic Paper* #508

Hennig-Schmidt, Heike; Li, Zhu-Yu; Yang, Chaoliang (2008): “Why people reject advantageous offers – Non-monotonic strategies in ultimatum bargaining: Evaluating a video experiment run in PR China”, in: *Journal of Economic Behavior & Organization*, 65.2: 373–384

Hennig-Schmidt, Heike; Walkowitz, Gari (2016): “Negotiations among Chinese and Germans – An experimental case study”, in: *Homo Oeconomicus*, 32.3/4: 451–488

Henrich, Joseph; Boyd, Robert; Bowles, Samuel; Camerer, Colin; Fehr, Ernst; Gintis, Herbert; McElreath, Richard; Alvard, Michael; Barr, Abigail; Ensminger, Jean; Henrich, Natalie S.; Hill,

Kim; Gil-White, Francisco; Gurven, Michael; Marlowe, Frank W.; Patton, John Q.; Tracer, David (2005): "'Economic man' in cross-cultural perspective: Behavioral experiments in 15 small-scale societies", in: *Behavioral and Brain Sciences*, 28.6: 795–815

Herrmann, Benedikt; Thöni, Christian; Gächter, Simon (2008a): "Antisocial punishment across societies", in: *Science*, 319.5868: 1362–1367

— (2008b): "Antisocial punishment across societies", in: *Science*, 319.5868: Supplementary Material

Hey, John D.; Orme, Chris (1994): "Investigating generalizations of expected utility theory using experimental data", in: *Econometrica*, 62.6: 1291–1326

Holt, Charles A.; Laury, Susan K. (2002): "Risk aversion and incentive effects", in: *American Economic Review*, 92.5: 1644–1655

Hsee, Christopher K.; Weber, Elke U. (1999): "Cross-national differences in risk preference and lay predictions", in: *Journal of Behavioral Decision Making*, 12: 165–179

Hofstede, Geert (1980): *Culture's consequences: International differences in work-related values*. Beverly Hills: Sage Publications

Hofstede, Geert; Hofstede, Gert J.; Minkov, Michael (2010): *Cultures and Organizations - Software of the Mind: Intercultural Cooperation and Its Importance for Survival (Business Skills and Development)*. London: McGraw-Hill

Jaeger, David A.; Dohmen, Thomas; Falk, Armin; Huffman, David; Sunde, Uwe.; Bonin, Holger (2010): "Direct evidence on risk attitudes and migration", in: *Review of Economics and Statistics*, 92.3: 684–689

Kagel, John H.; Roth, Alvin E. (2000): "The dynamics of reorganization in matching markets: A laboratory experiment motivated by a natural experiment", in: *Quarterly Journal of Economics*, 115: 201–235

Kachelmeier, Steven J.; Shehata, Mohamed (1992): "Examining risk preferences under high monetary incentives: Experimental evidence from the People's Republic of China", in: *American Economic Review*, 82.5: 1120–1141

Kahneman, Daniel; Tversky, Amos (1979): "Prospect theory: An analysis of decision under risk", in: *Econometrica*, 47: 263–291

Khilstrom, Richard E.; Laffont, Jean-Jacques (1979): "A general equilibrium entrepreneurial theory of firm formation based on risk aversion", in: *Journal of Political Economy*, 87.4: 719–748

Kimball, Miles S. (1990): "Precautionary saving in the small and in the large", in: *Econometrica*, 58.1: 53–73

— (1992): "Precautionary motives for holding assets", in: Newman, P.; Milgate, M.; Falwell, J. (eds.): *The New Palgrave Dictionary of Money and Finance*. London: MacMillan, 158–161

Knight, Frank H. (1921): *Risk, uncertainty and profit*. New York: Hart, Schaffner and Marx

Lau, Lai-Yin; Ranyard, Rob (2005): "Chinese and English probabilistic thinking and risk taking in gambling", in: *Journal of Cross-Cultural Psychology*, 36.5: 621–627

Lichtenstein, Sarah; Slovic, Paul (1971): "Reversals of preference between bids and choices in gambling decisions", in: *Journal of Experimental Psychology*, 89.1: 46–55

Lindman, Harold R. (1971): "Inconsistent preferences among gambles", in: *Journal of Experimental Psychology*, 89.2: 390–397

Liu, Elaine M.; Meng, Juanjuan; Wang, Joseph T. Y. (2014): "Confucianism and preferences: Evidence from lab experiments in Taiwan and China", in: *Journal of Economic Behavior & Organization*, 104: 106–122

Lönnqvist, Jan-Erik; Verkasalo, Markku; Walkowitz, Gari (2011): "It pays to pay – Big Five personality influences on co-operative behavior in an incentivized and hypothetical prisoner's dilemma game", in: *Personality and Individual Differences*, 50.2: 300–304

Miller, Louis; Meyer, David E.; Lanzetta, John T. (1969): "Choice among equal expected value alternatives: Sequential effects of winning probability level on risk preferences", in: *Journal of Experimental Psychology*, 79.3: 419–423

Noussair, Charles N.; Trautmann, Stefan T.; Van de Kuilen, Gijs (2014): "Higher order risk attitudes, demographics, and financial decisions", in: *Review of Economic Studies*, 81.1: 325–355

Ockenfels, Axel; Reiley, David; Sadrieh, Abdolkarim (2006): "Online auctions", in: Hendershott, T. (ed.): *Handbooks in Information Systems, vol. 1*. Amsterdam: Elsevier, 571–628

Ockenfels, Axel; Weimann, Joachim (1999): "Types and patterns: An experimental East-West-German comparison of cooperation and solidarity", in: *Journal of Public Economics*, 71: 275–287

Oosterbeek, Hessel; Sloof, Randolph; Van De Kuilen, Gijs (2004): "Cultural differences in ultimatum game experiments: Evidence from a meta-analysis", in: *Experimental Economics*, 7.2: 171–188

Ortmann, Andreas; Hertwig, Ralph (2002): "The costs of deception: Evidence from psychology", in: *Experimental Economics*, 5.2: 111–131

Rieger, Marc O.; Wang, Mei; Hens, Thorsten (2014): "Risk preferences around the world", in: *Management Science*, 61.3: 637–648

Roth, Alvin E. (1995): "Bargaining experiments", in: Kagel, John H.; Roth, Alvin E. (eds.): *Handbook of Experimental Economics*. Princeton: Princeton University Press, 254–348

— (2002): "The economist as engineer: Game theory, experimentation, and computation as tools for design economics", in: *Econometrica*, 70: 1341–1378

Roth, Alvin E.; Prasnikar, Vesna; Okuno-Fujiwara, Masahiro; Zamir, Shmuel (1991): "Bargaining and market behavior in Jerusalem, Ljubljana, Pittsburgh, and Tokyo: An experimental study", in: *American Economic Review*, 81.5: 1068–1095

Roy, Abhik; Walters, Peter G.; Luk, Sherriff T. (2001): "Chinese puzzles and paradoxes: Conducting business research in China", in: *Journal of Business Research*, 52.2: 203–210

Savage, Leonard J. (1954): *The Foundations of Statistics*. New York: Wiley Publications in Statistics

Schubert, Renate; Brown, Martin; Gysler, Matthias; Brachinger, Hans W. (1999): "Financial decision-making: Are women really more risk-averse?", in: *American Economic Review*, 89.2: 381–385

Shenkar, Oded (1994): "The People's Republic of China: Raising the bamboo screen through international management research", in: *International Studies of Management & Organization*, 24.1–2: 9–34

Smith, Vernon L. (1976): "Experimental economics: Induced value theory", in: *American Economic Review*, 66.2: 274–279

— (1991): *Papers in Experimental Economics*. Cambridge: Cambridge University Press

Statman, Meir (2008): "Countries and culture in behavioral finance", in: *CFA Institute Conference Proceedings Quarterly*, 25.3: 38–44

Stening, Bruce W.; Zhang, Marina Y. (2007): "Methodological challenges confronted when conducting management research in China", in: *International Journal of Cross Cultural Management*, 7.1: 121–142

Sutter, Matthias; Kocher, Martin G.; Glätzle-Rützler, Daniela; Trautmann, Stefan T. (2013): "Impatience and uncertainty: Experimental decisions predict adolescents' field behavior", in: *American Economic Review* 103.1: 510–531

Tan, Justin (2001): "Innovation and risk-taking in a transitional economy: A comparative study of Chinese managers and entrepreneurs", in: *Journal of Business Venturing*, 16.4: 359–376

Vieider, Ferdinand M.; Chmura, Thorsten; Fisher, Tyler; Kusakawa, Takao; Martinsson, Peter; Thompson, Frauke M.; Sunday, Adewara (2015a): "Within-versus between-country differences in risk attitudes: implications for cultural comparisons", in: *Theory and Decision*, 78.2: 209–218

Vieider, Ferdinand M.; Lefebvre, Mathieu; Bouchouicha, Ranoua; Chmura, Thorsten; Hakimov, Rustamdjan; Krawczyk, Michal; Martinsson, Peter (2015b): "Common components of risk and uncertainty attitudes across contexts and domains: Evidence from 30 countries", in: *Journal of the European Economic Association*, 13.3: 421–452

Von Neumann, John; Morgenstern, Oskar (1944): *Theory of Games and Economic Behavior*. Princeton: Princeton University Press

Weber, Elke U.; Hsee, Christopher (1998): "Cross-cultural differences in risk perception but cross-cultural similarities in attitudes towards perceived risk", in: *Management Science*, 44.9: 1205–1217