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## **THREE ESSAYS ON RISK ATTITUDES AND SOCIAL IMAGE**

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# General Introduction

Conventional economic theories are based on the premise that individuals are homogeneous in risk attitudes and risk-neutral in decision-making. They usually assume that individuals maximize their sole monetary payoffs. This dissertation departs from these conventional assumptions and adopts the analysis in the perspective of behavioral economics. In one essay, we study how individuals' heterogeneous risk attitudes contribute to explain their migrations decisions in a field setting. In the other two essays, we analyze whether individuals' willingness to maintain self- and others' social image leads them to sacrifice resources and to behave reciprocally in terms of image.

Risk attitudes represent how individuals perceive, understand and respond to the predictable and unpredictable events. On the stock market, traders have to constantly respond to volatile information of listed companies' shares and estimate the potential gain or loss before they determine to buy or sell the shares. In credit markets, credit managers have to evaluate the qualification and competence of firms and assess the risk of defaulting before lending money to them. When making decisions, individuals estimate the possibility of failure and success and evaluate to what extent they can



bear the variance in payoffs. Therefore, the investigation of individuals' risk attitudes is of critical essential to understand economic behavior.

To explore risk attitude is important to distinguish between three kinds of uncertainties. Under stable uncertainty, the decision-maker knows the occurrence probability of each possible outcome. Under ambiguity, the decision-maker does not know the occurrence probability of each outcome. Under strategic uncertainty, the occurrence probability of each outcome is not only determined by the decision-maker but also by the decisions of other decision-makers.

The first essay of this dissertation aims at investigating whether individuals' risk attitudes are relevant to individuals' migration status and in particular, which kind of risk attitude is better able to predict their migration status. Migration across countries or across regions has become a prevailing and important phenomenon around the world. According to United Nation global migration statistics, the number of international migrants increases sharply in recent decades. There are 232 million international migrants worldwide in 2013, constituting 3.2% of the world's population. In economic perspective, migration plays an important role in reallocating human resources efficiently and effectively on labor market. However, out-migration for individuals intending to migrate is a critical and risky decision. Individuals intending to migrate might face unpredictable living environment and confront unforeseeable working competitions in the in-flowing locations. Furthermore, migrants have to give up their local social networks and whether it's feasible to build new social network in in-flowing locations is unknown to them. All in all, out-migration is a process filled

with a mixture of diversified uncertainties. Nevertheless, the relationship between individual's risk attitudes and their migration decision is relatively underexplored in current literatures (Jaeger *et al.*, 2010, Williams and Balaz, 2012). In addition, which specific dimension of risk attitudes could explain individuals' migration decisions still remain unanswered?

An artefactual field experiment was conducted in China to collect incentivized data on risk attitudes in an ecological validated environment and then relate the data to individuals' migration status. Migrants in their inflowing locations and stayers in their hometowns were recruited and invited to take part in the experiment. We classified stayers to two categories, the first category is stayers in locations with a high proportion of out-migration and the other category is stayers in locations with a low proportion of out-migration. The comparison between the two categories of stayers allows us to control the distribution variance of individuals' risk attitudes due to a possible self-selection process – more risk-seeking individuals firstly choose to migrate to other regions, while more risk-averse individuals remain at their home.

Incentive compatible tasks were used to elicit participants' risk attitudes over stable uncertainty, ambiguity and strategic uncertainty. Our results show that migration is correlated with a higher tolerance to strategic uncertainty - Compared with stayers in locations with out-migration; migrants show more competitiveness in a strategic environment. In contrast, participants in east China and participants in west China show significant differences in stable uncertainty and ambiguous uncertainty other than in strategic uncertainty. The behavioral differentials across different regions

in China suggest that different economic systems between east China and west China due to the progressive transition to market economy perhaps reshape individuals' behavioral preferences.

The two other essays study how individuals' behavior is affected by image concern and group identity. Current literature in economics has validated that the positive image deriving from social approval by others and the negative image arising from deviating from the social norm substantially influence individuals' behavior (Johansson-Stenman and Martinsson, 2005; Alpizar *et al.*, 2008; Ariely *et al.*, 2009; Lacera and Macis, 2010; Johansson-Stenman and Svedsater, 2012;). The incentive to seek social approval is prevalent across various countries and societies. In particular, people trying to maintain face and saving others' face is particularly emphasized in Confucian cultures.

The second essay studies whether individuals are willing to sacrifice part of their resources to save own and others' image. Because the public exposure of the least performers in a working group may generate public embarrassment, our setting allows us to test how the motivation to preserve social recognition leads individuals to deviate from a purely monetary maximization strategy and act pro-socially to preserve self- or others' image. In our experiment, individuals are allowed to avoid self- or other group members' public exposure by sacrificing a proportion of their monetary payoffs. The social distance between individuals is manipulated by creating group identity. Individuals are matched with co-workers who have either the same group affiliation or the opposite group affiliation (Akerlof and Kranton, 2000).

Our second essay finds that most of the least performers chose to incur a cost to avoid the exposure in public. A significant proportion of participants are allowed to sacrifice a portion of their monetary payoffs to avoid others' lose face. This other-regarding behavior is robust to a variation of the social distance between the group members. Furthermore, the public exposure of the least performers has an influence on effort provision in the following stage - the least performers who were publicly exposed in front of other individuals reduce their effort provision in the last stage of the experiment. This evidence indicates that the public exposure of a lower performance crowds out intrinsic motivation.

These findings in complement the previous literature on the importance of image on individuals' pro-social contribution, coordination, effort provision etc. Individuals are not only concerned about their self-image but also are concerned about others' image even at the cost of their own monetary interests. Individuals' willingness to preserve others' self-esteem provides an insight into analyzing human's social interactions and communication relationships.

Our third essay extends the study of image to reciprocal behavior. Specifically, it explores whether individuals demonstrate reciprocal behavior in terms of image and how the availability of image reciprocity affects individuals' effort provision. Reciprocity in the experiment has been shown to be the essential vehicle through which individuals care about others' payoffs and achieve Pareto improvements in the general welfare (Kirchler *et al.*, 1996, Fehr *et al.*, 1998, Fehr *et al.*, 1997, Fehr *et al.*, 1998, Fehr *et al.*, 2002, Falk, 2007, Blumenstock, 2011). In line with findings in

empirical research, economists have incorporated reciprocity into theory to better explain human behavior (Charness and Rabin, 2002, Falk and Fischbacher, 2006).

However, most of the economics literature focuses on monetary payoff, in this essay; we are concerned about the reciprocity in the non-monetary domain, specifically image reciprocity. Indeed, it's a conventional wisdom that in trade negotiations and commercial communication, individuals show respect with each other and avoid others' embarrassment especially in public. Because of the importance of social recognition and respect (Ellingsen and Johannesson, 2007, 2008a), behavior to maintain others' self-esteem and avoid embarrassment is considered as a kind behavior and could result in positive reciprocal feedback. The opposite holds if individuals spoil somebody's self-esteem does not make any action to avoid others' embarrassment.

The design of this essay allows individuals to reward somebody's kind behavior to examine positive reciprocity in terms of public praise. In the negative domain, individuals are allowed to punish somebody's unkind behavior and express negative reciprocity in terms of image by preventing the public praise of their good performance. Finally, we also examine whether the availability of image reciprocity leads individuals to perform strategically in effort provision.

Our experiment finds that individuals positively respond to others' kind behavior in terms of image. We also observed indirect reciprocity - individuals positively reward somebody who saved the face of a third party. In contrast, individuals were not found to reciprocate negatively to others' unkind behavior in terms of image. Data

collected from surveys show that lifting anonymity of the least performer leads to negative emotions, while the public praise of the best performer arouse happiness. This constitutes the psychological foundation of people's positive reciprocal behavior. The behaviors to avoid others' negative emotions and to promote others' positive emotions induce others' positive reciprocal feedbacks. This dissertation sheds light on the understanding of risk attitudes and social-image and paves the way for the future research on these issues.

# Essay 1

## Strategic Uncertainty and Migration Decisions: A Field Experiment in China<sup>1</sup>

### 1.1 Introduction

Migration plays a critical role in efficiently re-allocating labor to the place where it is valued the most; migration is the “grease for the wheel of the labor market” (Borjas, 2001). Therefore, it is important to understand migration decisions: what types of people choose to migrate? Are there common characteristics among migrants? The past few decades have witnessed a burgeoning interest in understanding the individual determinants of migration decisions, including expected income differences (Harris and Todaro, 1970; Brucker and Jahn, 2011); rank in the local income distribution (Stark and Taylor, 1991); age and education (Sjaastad, 1962; Schwartz, 1976; Chiswick, 1986; Malamud and Wozniak, 2012); family and personal networks (Boyd, 1989; Pedersen *et al.*, 2008; Munshi, 2003); concentration of peers in the area of

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<sup>1</sup> This chapter is a joint work with Li Hao, Daniel Houser and Marie Claire Villeval. We acknowledge the financial supports from the French National Research Agency (HEIDI grant ANR-11-EMCO-011) and the Interdisciplinary Center for Economic Science at George Mason University.

destination (Mora and Taylor, 2005); asymmetric information on skills (Katz and Stark, 1987; Chen, 2005) .

This paper focuses on the relationship between individuals' risk preferences and their migration status. The decision to relocate to a new environment naturally involves uncertainty, *e.g.*, regarding prospects on the labor market, income, housing and lifestyles, especially at the beginning of the relocation. Nonetheless, and although early theoretical literature has recognized its importance (Stark, 1981; Stark and Levarhi, 1982; Katz and Stark, 1986), very few empirical studies on migration have measured the role of individuals' risk preferences (Williams and Balaz, 2012). Moreover, the empirical evidence in the literature has largely relied on census or survey data with self-reported risk preferences that were not elicited in an incentive compatible way (David, 1974; Stark and Levhari, 1982; Guiso and Paiella, 2006; Gibson and McKenzie, 2009; Jaeger *et al.* 2010; Czaika, 2012). For example, Jaeger *et al.* (2010) used survey data from Germany<sup>1</sup> to provide evidence that migration propensity is positively associated with willingness to take risks. To the best of our knowledge, we are the first to use an incentivized field experiment to measure risk preferences directly and investigate the relationship between risk preferences and migration propensity.<sup>2</sup>

We conducted our experiment in China, where the current rural-urban labor

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<sup>1</sup> Jaeger *et al.* (2010) used survey data from the German Socio-Economic Panel (SOEP) where the risk preferences are measured on an eleven-point scale with the question "willingness to take risk in general," with no monetary incentives provided to survey respondents.

<sup>2</sup> More generally, see McKenzie and Yang (2012) on the advantages of using experiments to study migration.



migration flows are the largest in the history of humanity (Meng *et al.*, 2010). China's transition to a market economy first began in its eastern and southern cities in 1978, while the suppression of labor mobility also gradually lessened (Lin *et al.*, 1998; Zheng *et al.*, 2003). The abundant labor in rural areas (80% of China's population in early 1980's) began to move to urban areas in search of job opportunities in the rapidly growing manufacturing and service sectors. The scale of migration continued to rise, with the number of migrants surpassing 260 million in the year 2012 alone.<sup>1</sup> These migrant workers are mainly low skilled; they live in employer-provided dormitories, and save aggressively to support family members back home.

This paper reports data from an artefactual field experiment investigating whether Chinese migrants exhibit attitudes towards risk and uncertainty that differ from their counterparts who did not migrate. Our subjects consist of both migrants and non-migrants. Migrants are people who work in a county or a city different from the one listed as their domicile residence in the *Hukou* system (*i.e.*, Household Registration System).<sup>2</sup> Non-migrants, or "stayers," are those who stay in their hometowns. We elicited each subject's preferences under risk and ambiguity, as well as willingness to compete in an environment with strategic uncertainty.

We want to clarify important design features in our experiment.

First, we consider two types of stayers: (i) those in locations where there is little out-migration; and (ii) those in locations where there is substantial out-migration.

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<sup>1</sup> According to the 2012 annual report of migrant workers published by the National Bureau of Statistics of China: [http://www.stats.gov.cn/tjfx/jdfx/t20130527\\_402899251.htm](http://www.stats.gov.cn/tjfx/jdfx/t20130527_402899251.htm).

<sup>2</sup> This is the generally agreed-upon definition, which is used by the Chinese Census Bureau.

We hypothesize that these two types of stayers could exhibit different preferences. If migration is indeed a self-selection process in which risk-seeking individuals migrate and risk-averse individuals stay (Umblijs, 2012), then stayers in locations with substantial out-migration are the most risk-averse people in the population, and migrants are the most risk-seeking. These stayers are also possibly less competitive as large-scale migration can “improve” the situation of stayers through less competition for jobs at the local level (Mishra, 2007; McKenzie and Yang, 2012). On the other hand, stayers in locations with little out-migration are still a mixture of risk-seeking and risk-averse individuals. This leads to our prediction regarding the risk preferences of all three groups: stayers in locations with significant out-migration are more risk-averse, followed by stayers in locations with little out-migration; finally, migrants are the most risk-seeking.<sup>1</sup>

Second, we conducted our experiment in both East China and West China, to capture the potential differences across regions. As we discussed earlier, a market economy was first introduced in East China, and then gradually extended to West China (Lin *et al.*, 1998; Zheng *et al.*, 2003). Hence, East Chinese are more experienced with the market economy, and thus more accustomed to wage and price differences and volatilities. Therefore, we predict that East Chinese are no more risk-averse than West Chinese and this may influence the propensity to migrate.

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<sup>1</sup> The reason that out-migration occurs in some locations, but not in others, is largely due to history-dependence. Chinese migrants rely heavily on their social networks to learn about their job prospects in new locations (see, *e.g.*, Zhao, 2003; Giles, 2006; Chen *et al.*, 2010). As long as the first group of people migrated, people who stayed have better information about migration, which leads to decreased uncertainty. As a result, more migration occurs.

Third, we distinguish between two different sources of uncertainty: state uncertainty and strategic uncertainty. State uncertainty refers to unknown outcomes, with or without information regarding the probability distributions (Ellsberg, 1961; Fox and Tversky, 1995). Strategic uncertainty, on the other hand, is caused by the purposeful behavior of other players in an interactive decision situation (Brandenburger, 1996). Migration exposes individuals to competition from other migrants and local residents, which involves the strategic element by other decision-makers.<sup>1</sup> In our experiment, we use both incentivized lottery choices to elicit risk and ambiguity preferences and a market entry game inspired by Camerer and Lovo (1999) to elicit willingness to compete, *i.e.*, preference under strategic uncertainty with risk of losses.

Finally, we also included in our experiment a measure for inequality aversion, as income inequality could generate feelings of being relatively deprived or relatively satisfied, both of which influence individuals' migration decisions (Stark and Bloom, 1985). However, the results are insignificant and so we comment very briefly on this aspect.

Our main finding is that migrants are significantly more willing to enter competition under strategic uncertainty than non-migrants; nonetheless, these populations do not demonstrate differences in risk or ambiguity attitudes under state uncertainty.

Our contributions are twofold. First, we report the first incentivized field

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<sup>1</sup> This is even more the case when countries use visa lotteries to select among applicants (like the U.S. Green Card Lottery) (see examples in McKenzie and Yang, 2012).

experiment investigating the relationship between risk preferences and migration propensities. Second, we are the first to study the impact of different sources of risk and uncertainty, namely, state risk and uncertainty resolved by die rolls and strategic uncertainty due to other people's beliefs and actions. This is important in that the commonly-used incentivized lottery-type elicitation is often found to have quite weak predictive power (Dohmen *et al.*, 2005; 2011). It follows that it is important to examine alternative approaches. In this sense, our paper makes a methodological contribution by studying the differences between migrants' and non-migrants' behavior in ecologically valid market entry games.

Our paper proceeds as follows. Section 2 briefly reviews the related literature. Section 3 describes our experimental design. Section 4 reports our results. Section 5 discusses these results and Section 6 concludes.

## **1.2 Related Literature**

Our paper contributes to two related literatures. The first is the literature on risk attitudes as a determinant of migration decisions, and the second is the literature on the methodology of eliciting risk attitudes.

In the theoretical literature on the determinants of migrations, Stark (1981) was among the first to recognize risk preferences as a major cause of the migration decision. Stark and Levhari (1982) have shown that risk aversion may explain that rural families in developing countries may push one member to migrate to the urban sector in order to diversify their income portfolio. Katz and Stark (1986) have

considered intertemporal risk and uncertainty and demonstrated that migrants may accept an immediate higher risk against the perspective of a great improvement of their future status and a subsequent lower risk. Dustmann (1997) has shown how uncertainty affects the length of migrations and the re-migration decision. In contrast to the previous studies based on the expected utility theory, Czaika (2012) has modeled the migration decision under the prospect theory of Kahneman and Tversky (1979): potential migrants update their expectations about their future prospects when deviating from their reference point and migration flows react more to negative than equivalent positive economic prospects.

The empirical literature on risk attitudes and migrations has developed more recently. An early exception is Sahota (1968) who evokes the higher dynamism and greater tolerance for risk of migrants in Brazil. It is interesting to note that contrary to the early theoretical literature, most empirical studies have identified a negative link between risk aversion and migration propensity. Heitmueller (2005) found that risk-averse individuals have a lower propensity to migrate. In a field experiment conducted in Bangladesh, Bryan *et al.* (2012) found that the migration decision is positively influenced by the provision of insurance in addition to a loan. This is an indirect measure of the impact of risk attitudes. Direct measures include self-reported risk preferences. Many studies have used the data from the German Socio-Economic Panel (SOEP) to study migration propensities. In particular, respondents reported their “willingness to take risks, in general” on a scale from 0 to 10, where 0 indicates “unwilling to take risks” and 10 indicates “very willing to take risks.” Using SOEP

data and defining migrants as individuals who changed region at least once between 2000 and 2006, Jaeger *et al.* (2010) provided the first direct evidence that individuals who are more willing to take risks are more likely to migrate. Constant *et al.* (2011) found that second generation migrants are more willing to take risks than natives. Finally, Dohmen *et al.* (2005; 2011)<sup>1</sup> considered self-reported willingness to take risks in specific domains/contexts, such as car driving, financial matters, sports/leisure, career and health. They found that the only risk measure that has predictive power on respondents' decision to move is the global self-assessment of risk. In other words, none of the domain-specific risk measurements are significant at explaining migration decisions. The result holds for migration from East Germany to West Germany, as well as from West to East Germany. Using survey data from three Pacific countries, Gibson and McKenzie (2009) also found that migration propensity is positively associated with willingness to take risks.

In contrast, Conroy (2009) reported opposing results for Mexico: more risk-averse women are more likely to migrate from countryside to urban areas than less risk-averse women, whereas risk preferences have no predictive power of men's migration decisions. Risk-averse women might use migration as a means to escape from environments with higher income variability.

However, the risk preference measures from survey responses used in these studies were not given any incentives for accurate reporting. In addition to the

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<sup>1</sup> Dohmen *et al.* (2005) is the discussion paper version of the published paper Dohmen *et al.* (2011). The former reports more comprehensive results than the latter. Hence, some of the results we discuss here are only available in Dohmen *et al.* (2005).

survey data, Dohmen *et al.* (2005; 2011) also studied the measurement of risk attitudes using incentivized lottery-type elicitation commonly used in experimental research (see *e.g.*, Holt and Laury, 2002; Andersen *et al.*, 2008). Their experiment was conducted in subjects' homes, where subjects first completed the SOEP questionnaire, and then participated in a paid lottery experiment (similar to our risk elicitation under state uncertainty). The authors found that when predicting risk-taking behavior across different domains or contexts (*i.e.*, different sources of uncertainty), global self-assessment of risks is an overall better predictor than risk attitudes elicited using incentivized lotteries. They concluded that risk attitudes do not hold constant across domains. This finding seems to raise questions regarding the validity of the conventional practice of using lottery-type risk elicitation to explain behaviors in other domains.

A potential concern with the use of incentivized lottery-type elicitation methods is a risk of confusion. However, Charness and Viceisza (2011) indicate that both incentivized lottery-type risk elicitation and non-incentivized willingness-to-take-risk scale are at the cost of diminished level of comprehension in the rural developing world. They reported a low level of comprehension under both elicitation approaches. Aware of these difficulties, we did our best to facilitate our subjects' understanding of the instructions.

We contribute to this literature by using monetary incentives to provide more accurate measures not only of attitudes towards risk and ambiguity, but also towards strategic uncertainty.

## 1.3 Experimental Procedures and Design

### 1.3.1 Subjects Recruitment and Experiment Locations

In this study, migrants are individuals who move from rural to urban areas for work opportunities, and non-migrants are those who stay in their hometown in rural areas. Among non-migrants, we differentiate between those who live in areas with significant out-migrations versus areas with no out-migration. Hence, we study three types of subjects:

1. Migrants who work and live in urban locations,
2. Stayers in rural areas with out-migrations and
3. Stayers in rural areas without out-migrations.

Due to the fact that migrants in cities and comparable stayers in rural areas are not in the same location, it would have been highly impractical to conduct our experiment sessions with mixed types of subjects. Hence, each location in our experiment consisted of a single type. For each type, we had two locations: one in East China, and one in West China. Therefore, we had a total of six experiment locations. These locations are described in Table 1 and by the map in Figure 1.<sup>1</sup>

At each location, we conducted two sessions, with 12 subjects per session, and 24 subjects per location. The same group of three experimenters conducted all 12 sessions. As shown in Table 1, migrants were recruited in the cities of Beijing (East)

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<sup>1</sup> These locations were chosen for two reasons: First, the local migration flow had to satisfy our requirements based on the type of subjects we wanted to recruit. Second, they were local contacts that we could trust.



and Chengdu (West). Stayers in rural areas with out-migration were located near Yancheng, Jiangsu (East) and Xianyang, Shaanxi (West). Stayers in rural area with no out-migrations were located near Xuzhou, Jiangsu (East) and Jiuquan, Gansu (West).

Table 1. Number of Sessions and Subjects at Each Location

Subjects type	Location	Location	# of sessions	# of subjects
	West China	East China		
Migrants	Chengdu	Beijing	4	48
Stayers with Out-migration	Xianyang	Yancheng	4	48
Stayers with No Out-migration	Jiuquan	Xuzhou	4	48
Total number of subjects	72	72		144

Figure 1. Experimental Locations



We included both an East and a West location for each type of subjects for two reasons: First, to control for the gap in income and economic environments between East and West China. The East coast offers a much greater exposure to market-oriented economic activities as well as higher income than West China. Second, migrating from rural to urban areas within West China has become a new trend, so it is important to include migrants in West China in our study. Historically, the main pattern was migrating from rural inland areas to big cities in East and South

China, such as Beijing, Shanghai, and Guangzhou. In recent years, manufacturers have gradually moved their factories from the coast to inland provinces, due to the more abundant, hence cheaper, labor.

Subjects were recruited via flyers in all treatments. In addition, we used door-to-door recruiting with stayers in rural areas, and face-to-face recruitment for migrants living in cities. Potential participants were informed that they had the opportunity to earn cash if they participated in an experiment at the given location and time. As subjects arrived, they first completed a short survey (see Appendix 1) regarding their migration experience. We used the survey answers to determine whether each respondent qualified for the experiment. To qualify in Beijing and Chengdu as a migrant, one's domicile residence (*Hukou*) could not be part of the city, and the person must have resided in the city for at least 6 months. In the four rural locations, we required that participants have no migration experience at all.

Qualified subjects were invited to stay and participate in the main experiment that immediately followed the survey. Those who did not qualify received compensation for showing up and responding to the survey.<sup>1</sup> The qualification criterion was not made common knowledge. Subjects did not know any details about the experiment until the session started. No qualified subjects declined the opportunity to participate in the experiment; nor did anyone quit in the middle of the experiment. The two sessions in each location were conducted immediately back-to-back to

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<sup>1</sup> Disqualified survey respondents received gift bags that were equivalent to 8 Yuan. The gifts included everyday household items such as toothpaste, laundry detergent, etc. These seemed to be preferred over the small amount of cash. This does not interfere with the fact that subjects who participated in our main experiment received cash payment.

minimize communication among subjects about the experiment. A typical session lasted about 90 minutes. Mean earnings for subjects were 29.71 Yuan (about \$4.90) (Standard Deviation= 6.82).

### *1.3.2 Experimental Design*

The goal of our experimental design is to investigate whether migrants and stayers exhibit different preferences under state uncertainty and strategic uncertainty. The traditional preference elicitation approach only focuses on state uncertainty resolved via randomization devices. Here, we broaden the traditional approach by eliciting attitudes towards risk and uncertainty under state uncertainty, as well as willingness to compete in an environment with strategic uncertainty. The strategic element is especially important for migration decisions, because other job seekers' decisions immediately affect the prospect of getting a job in a new location.

Our main experiment includes three components. Part I elicits risk and ambiguity preferences under state uncertainty. Part II elicits attitudes towards inequality. Part III elicits preferences of competitiveness under strategic uncertainty, using a variant of the market entry game in Camerer and Lovo (1999).

At the beginning of each part, subjects were given very detailed instructions (see Appendix 2). They were also required to complete comprehension tests. They proceeded in the experiment only after demonstrating that they understood the environment. All decisions were made on paper.

#### *Part I: Risk Attitudes under State Uncertainty*

To elicit risk and ambiguity, we used a multiple price list approach following a

procedure similar to that of Fox and Tversky (1995). Each subject was presented with a set of choices between two options, A and B, as shown in Table 2.

Table 2: Risk and Ambiguity Elicitation

Risk:	Option A Certain payoff in Yuan	Option B 10 balls in an urn, 5 blue and 5 yellow; Blue pays 10 Yuan, Yellow pays 0.
Decision 1:	1	
Decision 2:	2	
Decision 3:	3	
Decision 4:	4	
Decision 5:	5	(10 Yuan, 50%; 0, 50%)
Decision 6:	6	
Decision 7:	7	
Decision 8:	8	
Decision 9:	9	
Decision 10:	10	
Ambiguity:		10 balls in an urn, unknown blue or yellow; Blue pays 10 Yuan, Yellow pays 0.
Decision 11:	1	
Decision 12:	2	
Decision 13:	3	
Decision 14:	4	
Decision 15:	5	10 Yuan or 0; unknown probability
Decision 16:	6	
Decision 17:	7	
Decision 18:	8	
Decision 19:	9	
Decision 20:	10	

For risk elicitation, there were a total of 10 decisions, one in each row, as shown in the first 10 rows in Table 2. For example, in the first row, Option A offered a certain payoff of 1 Yuan, while Option B was a lottery that paid 10 Yuan with 50% chance and 0 otherwise. To facilitate comprehension, we illustrated Option B using an urn with 10 balls, 5 black and 5 white. Subjects were told that if a black ball was drawn they would receive 10 Yuan, and if a white ball was drawn they would receive nothing.

As the subject moved down the list of 10 decisions, the lottery in Option B remained the same, while the certain payoff in Option A increased by 1 Yuan each row (ending at 10 Yuan).

To elicit preferences under ambiguity, we followed the same procedure with the exception that the composition of the urn (*i.e.*, the probability of winning 10 Yuan in Option B) was unknown to subjects.

After each subject submitted all 20 decisions in Table 2, only one out of the 20 decisions was randomly selected for payment. For this payment-binding decision, if Option A was chosen, the subject received the corresponding cash amount. If Option B was chosen, the subject drew a ball from the corresponding urn and was paid according to its color. Decisions were made at the beginning of the sessions but the random draws and payment were made only at the end of the session to avoid contamination of decisions across games.

### *Part II: Preference towards Inequality*

To elicit advantageous inequality aversion, we used a procedure inspired by the Modified Dictator Game of Blanco *et al.* (2011).<sup>1</sup> In this part, all the subjects made decisions in the role of a dictator, under the veil of ignorance. Each subject chose between two different allocations of income between himself and another player, Option A or Option B, as illustrated in Table 3. For example, in the first row, Option A offered equal earnings of 1 Yuan to both players, while Option B offered the first player an earning of 8 Yuan, and the second player 2 Yuan. As the subject moved

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<sup>1</sup> We did not elicit disadvantageous inequality aversion because the opportunity to migrate should increase the income gap between migrants and stayers at the benefit of the former, not the latter.

down the rows, the unequal earnings in Option B remained exactly the same, while the equal earnings in Option A increased 1 Yuan per row per player. The first 8 rows are in the gain domain, while the last 8 rows are in the loss domain.

Table 3: Inequality Elicitation

	Option A Equal earnings for Players X and Y	Option B Unequal earnings for Players X and Y
<b>Gain Domain</b>		
Decision 1:	X earns 1; Y earns 1	
Decision 2:	X earns 2; Y earns 2	
Decision 3:	X earns 3; Y earns 3	
Decision 4:	X earns 4; Y earns 4	
Decision 5:	X earns 5; Y earns 5	X earns 8; Y earns 2
Decision 6:	X earns 6; Y earns 6	
Decision 7:	X earns 7; Y earns 7	
Decision 8:	X earns 8; Y earns 8	
<b>Loss Domain</b>		
Decision 1:	X loses 1; Y loses 1	
Decision 2:	X loses 2; Y loses 2	
Decision 3:	X loses 3; Y loses 3	
Decision 4:	X loses 4; Y loses 4	
Decision 5:	X loses 5; Y loses 5	X loses 8; Y loses 2
Decision 6:	X loses 6; Y loses 6	
Decision 7:	X loses 7; Y loses 7	
Decision 8:	X loses 8; Y loses 8	

Earnings were calculated as follows. After all 16 decisions were submitted, only one decision was randomly selected for payment. Subjects were randomly matched in pairs, and assigned the role of either Player 1 or Player 2. For each pair, Player 1's choice for this decision was chosen to determine both Player 1 and Player 2's earnings. Subjects did not know whether they were Player 1 or Player 2 before the end of the session.

*Part III: Competitiveness: Preference under Strategic Uncertainty*

To investigate preferences under strategic uncertainty, we employed a variant of

Camerer and Lovoalvo's (1999) market entry game. In this game, subjects decided whether to enter a market with limited capacity or stay out. If the subject stayed out, she neither gained nor lost. If she entered, she would either gain or lose, depending on the total number of entrants and her rank among them. In our experiment, the ranks of entrants were determined by a random number generator. All 12 subjects in a session made their entry decisions simultaneously, so subjects had to take into account how many of their fellow participants they thought would enter the market. The fact that other people's decisions could affect one's earnings was the strategic uncertainty.

Before each subject made her entry decision for a given market capacity in a round, they also had to predict how many of the 11 other participants would enter the market in this round. These beliefs indicate whether individuals adjust their behavior to their perception of other players' competitiveness. They were incentivized with a simple rule such that the subject earned 2 Yuan if her prediction equaled the actual number of entrants for that round. This was in addition to their earnings from the game.

There were a total of 12 rounds of market entry game; payoffs are illustrated in Table 4. For example, in the first round (the first column in Table 4), the total number of prizes was 4, and the top 4 entrants earned 9 Yuan each. Any entrant ranked 5<sup>th</sup> place or lower lost 6 Yuan each. This is in contrast to earning zero if they chose to stay out. If the number of entrants was smaller than the number of prizes, then every entrant won a prize.

Table 4: Payoffs in Market Entry Game

Rank	Gain domain						Ambiguity		Loss domain			
	R.1 c=4	R.2 c=9	R.3 c=2	R.4 c=9	R.5 c=2	R.6 c=6	R.7 c=6	R.8 c=4	R.9 c=?	R.10 c=?	R.11 -	R.12 -
1	+9	+8	+18	+4	+27	+12	+6	+18	+6	+12	-1	-3
2	+9	+7	+18	+4	+9	+9	+6	+12	?	?	-2	-3
3	+9	+6	-6	+4	-6	+7	+6	+4	?	?	-3	-3
4	+9	+5	-6	+4	-6	+4	+6	+2	?	?	-6	-3
5	-6	+4	-6	+4	-6	+3	+6	-6	?	?	-6	-6
6	-6	+2	-6	+4	-6	+1	+6	-6	?	?	-6	-6
7	-6	+2	-6	+4	-6	-6	-6	-6	?	?	-6	-6
8	-6	+1	-6	+4	-6	-6	-6	-6	?	?	-6	-6
9	-6	+1	-6	+4	-6	-6	-6	-6	?	?	-6	-6
10	-6	-6	-6	-6	-6	-6	-6	-6	?	?	-6	-6
11	-6	-6	-6	-6	-6	-6	-6	-6	?	?	-6	-6
12	-6	-6	-6	-6	-6	-6	-6	-6	-6	-6	-6	-6
Stay out:	0					0				-4		

The number of prizes and payoffs at each rank varied from round to round. In the first 8 rounds, top ranks earned positive amounts that were either the same for all or decreasing with ranks. While the number of the prizes and the amounts changed, the sum of all prizes was always 36 Yuan. Next, the 9<sup>th</sup> (10<sup>th</sup>) round offered prizes of 6 (12) Yuan to top ranks, and losses of 6 Yuan to bottom ranks, but the total number of prizes was unknown to subjects. Hence, the degrees of ambiguity in rounds 9 and 10 were higher than in the first eight rounds. Up until round 10, staying out always yielded an earning of zero.<sup>1</sup>

To help make the game easier to understand, we framed the market as a fishing pond, and the total number of prizes was referred to as pond capacity. Subjects did not receive any feedback until all 12 rounds were finished, and they were clearly

<sup>1</sup> Rounds 11 and 12 explored the domain of negative earnings to capture attitudes towards losses in the presence of strategic uncertainty. In these rounds, staying out generated a loss of 4 Yuan, while entering and ranking among the top ranks resulted in a loss of less than 4 Yuan. Entering and ranking near the bottom resulted in a loss of 6 Yuan. We do not report the results on the last rounds in this paper.



informed that only one out of all 12 rounds would be randomly selected for payment at the end of the session.

## 1.4 Results

We first present key demographic characteristics. We then show that migrants and stayers do not exhibit any difference regarding their preferences under state uncertainty. Finally, we investigate their preference under strategy uncertainty using the market entry game. Our main results are that: (i) migrants are significantly more likely to enter competition than stayers in locations with out-migration; (ii) stayers in locations with no out-migration are more likely to enter competition than stayers in locations with out-migration.

### 1.4.1 Demographic Statistics

Table 5 summarizes some key demographics variables of the three groups of subjects in our experiment.

First, regarding age, migrants were youngest; stayers with no out-migration were older; and stayers with out-migration were the oldest. This is consistent with the observation that younger people migrate, and older people stay in their hometowns. Locations with no out-migration have more balanced age groups, so the average is in between. Income is ordered in exactly the opposite direction of subjects' ages, due to the fact that people migrate for better pay in urban areas. In all three groups, we had more men than women. Subjects, on average, were either middle school graduates or high school dropouts who spent 9 to 10 years in school. Naturally, the number of

elderly dependents (as grown children in China are expected to support their elderly parents and grandparents) is negatively correlated with subjects' age; it is also positively correlated with their income. Migrants reportedly support more elders on average than stayers, suggesting that greater family responsibility is a major motivation for young people to migrate for job opportunities.

Table 5: Demographic Statistics

Status	Migrants	Stayers with no out-migration	Stayers with out-migration
Age	32.2 (1.73)	37.3 (1.62)	45.12 (2.26)
Income/day (Yuan)	62.4 (10.3)	40.4 (3.80)	28.4 (3.80)
Male	0.60 (0.07)	0.51 (0.07)	0.75 (.06)
Education	9.8 (0.31)	8.5 (0.31)	10 (0.40)
Elderly dependents	2.27 (0.25)	2.02 (0.23)	1.36 (0.20)
Observations	48	48	48

*Notes:* Means are reported. Standard errors are reported in parentheses. \* 10% significance level; \*\* 5%, and \*\*\* 1%.

#### 1.4.2 Preference regarding Risks, Ambiguity, and Inequality

In this subsection, we report data on preferences towards risks, ambiguity, and inequality from Parts I and II of the experiment.

In Part I, a rational decision maker should switch at most once from the lottery (Option B) to the certain payoff (Option A) in both the risky and the ambiguous lotteries. The switch points in the two sets of decisions are informative about the individual's attitudes towards risk and uncertainty, respectively. We measure

preferences using the number of risky or ambiguous Option B chosen by the subject.<sup>1</sup> Option B has an expected payoff of 5 Yuan. Subjects will switch to the “safe” Option A when it is attractive enough. Switching at decision 5 or 6 indicates neutrality; switching earlier (later, respectively) indicates risk aversion (risk loving, respectively). Hence, the number of Option B’s indicates a subject’s willingness to take risk; the greater this number, the more willing the subject is to take risk.

In Part II, a rational decision maker should also switch at most once from the asymmetric (Option B) to the symmetric allocation (Option A) in the gain domain, and in the other opposite direction in the loss domain. Preferences towards inequality are measured by the number of unequal Option B chosen by the subject. In the gain domain, this indicates the subject’s willingness to accept inequality in earnings. In the loss domain, this suggests the willingness to take unequal losses. In both domains, the later the switch, the less inequality averse is the subject.

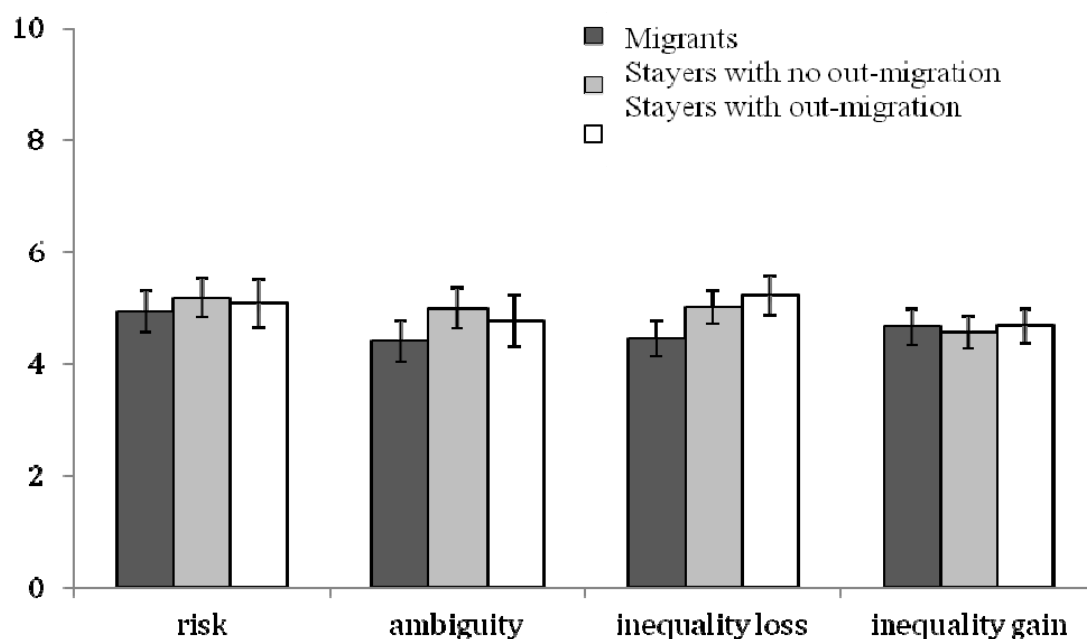
Figure 2 summarizes the mean and standard errors of the preferences by subject types. The first set of three bars indicates their risk preferences; the next sets of bars are for the attitudes towards ambiguity and towards inequality in the gain and the loss domains. None of the pair-wised comparisons between subject types is significant

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<sup>1</sup> Precisely, we take the midpoint of the decision numbers before and after the switch. For example, if a participant switches over to Option A from Option B at Decision #5, then we record 4.5 as his risk preference. For people who switch back and forth, we count the frequency of the risky option (Option B) chosen, and add 0.5 for the precision adjustment. In fact, 35, 30, 40 and 46 subjects switched more than once in the risk game, the ambiguity game, in the gain domain of the inequality game and in the loss domain of the inequality game, respectively. These values are high, but the frequency of multiple switching does not differ significantly between our groups of subjects (see Table A1 in Appendix 3), and frequent multiple switching is typical of experiments conducted in the field (see notably Charness and Viceisza, 2011).

(mean comparison tests,  $p > 0.10$ ) (see Table A2 in Appendix 3).

Figure 2. Preferences for Risk, Ambiguity and Inequality, by Migration Status



We formally show our first result using regression analysis with control variables shown in Table 6.

**Result 1.** (Preference under State Uncertainty). *Under state uncertainty, migrants and stayers do not exhibit any difference in preferences over risk and ambiguity.*

**Support for Result 1.** Table 6 reports multivariate regressions with robust standard errors for four dependent variables: subjects' preferences for risk, ambiguity, inequality in the gain domain, and inequality in the loss domain. These preferences are measured as the number of risky (or unequal) options subjects chose. We included a dummy variable *Multi-switcher* that takes value "one" if the subject switched between risky and safe options (or equal and unequal) more than once, and is zero otherwise. There are two regressions for each preference, where we either do or do

not include the variable *East*, a dummy variable that takes value “one” if the subject was located on the East coast, and is zero otherwise. Our main interests are the coefficients of “*Migrant*” and “*Stayer with no out-migration*”, which indicate whether these two groups behave different from the omitted category “*Stayer with out-migration*.” Other control variables are gender, age and income.

Regarding preferences towards risk and ambiguity, two results are robust. First, migrants do not differ from stayers with out-migration; second, stayers with no out-migration do not differ from stayers with out-migration. This result is in contrast with the conventional wisdom that migrants tend to be more willing to take risks.

Regressions of inequality in both gain and loss domains are hardly significant at the 5% level, with F-statistics smaller than 2.50 in all cases. Because conclusions can be misleading if one makes inferences based on insignificant models, the rest of this subsection focuses on preferences regarding risks and ambiguity only.

The control variables, such as gender and age, are significant in the direction we expected (Croson and Gneezy, 2009; Mather *et al.*, 2012). Males subjects are significantly more risk/ambiguity-seeking than females, while younger individuals are more risk/ambiguity-seeking than older ones, controlling for migration status. The variable *East* is worth noting here. In specifications (2) and (4), the regressions of *Risk* and *Ambiguity*, adding *East* significantly improved the regression’s goodness-of-fit, as evidenced by the fact the adjusted  $R^2$  more than doubled in both cases.

Table 6: Determinants of the Preferences under State Uncertainty

	Risk		Ambiguity		Inequality Gain		Inequality Gain	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Migrant	-0.895 (0.645)	-0.985 (0.616)	-0.978 (0.680)	-1.074 (0.667)	-1.238** (0.508)	-1.292** (0.510)	0.070 (0.519)	0.036 (0.524)
Stayer w. no out-migration	-0.147 (0.655)	-0.260 (0.632)	-0.025 (0.694)	-0.153 (0.667)	-0.485 (0.499)	-0.553 (0.500)	-0.015 (0.443)	-0.056 (0.448)
Male	1.389* (0.471)	1.323* (0.455)	1.102** (0.504)	1.009** (0.483)	0.569 (0.407)	0.536 (0.392)	0.211 (0.405)	0.189 (0.394)
Age	-0.044* (0.016)	-0.050* (0.016)	-0.030* (0.018)	-0.037** (0.017)	-0.027* (0.016)	-0.030* (0.015)	0.004 (0.015)	0.002 (0.015)
Income	0.006* (0.003)	0.004 (0.003)	0.009* (0.005)	0.007 (0.004)	0.004 (0.003)	0.003 (0.003)	-0.000 (0.002)	-0.001 (0.003)
Multi-switcher	0.654 (0.399)	0.579 (0.419)	0.484 (0.392)	0.509 (0.414)	-0.312 (0.371)	-0.308 (0.377)	-0.053 (0.345)	-0.060 (0.341)
East	-	1.432* (0.434)	-	1.663* (0.454)	-	0.839** (0.384)	-	0.501 (0.348)
Intercept	5.856* (1.013)	5.609* (1.005)	5.127* (1.081)	4.818* (1.100)	-6.038* (0.746)	5.883* (0.770)	4.358* (0.745)	4.269* (0.775)
R <sup>2</sup>	0.123	0.194	0.096	0.187	0.076	0.111	0.004	0.020
F	4.123	5.779	2.691	5.037	2.015	2.403	0.110	0.347
Nb of obs.	131		129		131		131	

Notes: OLS regressions with heteroskedasticity-robust standard errors reported in parentheses. Regressions of “Ambiguity” have two fewer observations due to missing observations in some of the regressors. \* is 10% significance level; \*\* is 5%, and \*\*\* 1%.

### 1.4.3 Preference regarding Competition under Strategic Uncertainty

We report in this subsection results from the first eight rounds of the market entry game where all payoffs are positive and the number of prizes is known to subjects.<sup>1</sup>

In these rounds, there are several asymmetric Nash equilibria in pure strategy, under the assumption of risk neutrality. If rational,  $c+5$  or  $c+6$  decision-makers should enter the market. For  $c=2$  and  $c=4$ , the  $c+6^{\text{th}}$  player should be indifferent because his expected payoff from entry is 0. Above  $c+6$  entrants, entering the market leads to negative expected payoffs. For  $c=6$  and  $c=9$ , all the players should enter the market

<sup>1</sup> Regressions of the last four rounds in the market entry game are not significant; therefore, we do not report those results.

(only the 12<sup>th</sup> subject should be indifferent when  $c=6$ ). A higher expected number of entrants above the market capacity should reduce the entry of risk-neutral individuals (except when  $c>4$ ). Naturally, risk and ambiguity aversion should lead players to be indifferent between entering and staying out at lower ranks above the capacity.

To analyze whether competitiveness can be predicted by one's migration status, we have estimated three Probit models in which the dependent variable is the decision to enter the market, with standard errors clustered at the individual level. We vary the number of control variables we include in the regression, such as male gender, age, income, risk preferences (measured by the switching point from the risky to the safe option) and East. The left panel of Table 7 reports marginal effects in these regressions.<sup>1</sup> This leads to Result 2.

**Result 2a.** (Competitiveness). *Migrants are significantly more likely to enter the market competition than stayers with out-migration.*

**Result 2b.** (Competitiveness). *Stayers with no out-migration are significantly more likely to enter the market competition than stayers with out-migration.*

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<sup>1</sup> Our results are unchanged under an alternative analysis which estimates effects using a linear probability model clustered at the individual level.

Table 7: Determinants of the Probability of Entry and Beliefs in Market Entry Game

	Decision to enter			Predicted markets competitiveness		
	(1)	(2)	(3)	(4)	(5)	(6)
Migrant	0.193*** (0.075)	0.189** (0.093)	0.209** (0.096)	0.164** (0.077)	0.173* (0.091)	0.209** (0.094)
Stayer w. no out-migration	0.134** (0.067)	0.135* (0.075)	0.139* (0.075)	0.177** (0.072)	0.185** (0.076)	0.198*** (0.076)
Male	-	0.022 (0.063)	0.004 (0.062)	-	0.005 (0.073)	0.028 (0.073)
Age	-	-0.000 (0.003)	0.000 (0.003)	-	-0.000 (0.003)	0.000 (0.003)
Income	-	-0.000 (0.001)	-0.000 (0.001)	-	-0.000 (0.002)	-0.001 (0.001)
Risk	-	0.017 (0.011)	0.017 (.011)	-	-	0.030** (0.013)
East	-	-0.039 (0.054)	-0.039 (0.054)	-	-	-0.042 (0.060)
Pseudo R <sup>2</sup>	0.026	0.026	0.034	0.019	0.021	0.037
Nb of clusters	130	129	129	130	129	129
Nb of obs.	1040	1032	1032	1040	1032	1032

*Notes:* Probit regressions clustered at individual level, with marginal effects reported as point estimates, and heteroskedasticity-robust standard errors reported in parentheses. \* is 10% significance level; \*\* is 5%, and \*\*\* 1%.

**Support for Result 2.** The left panel of Table 7 (specifications 1, 2 and 3) shows that, robust to a number of different sets of control variables, migrants are 21% more likely to enter the market than stayers with out-migration. Similarly, stayers with no out-migration are 14% more likely to enter the market competition than stayers with out-migration.

Then, we analyze the determinants of the predicted market competitiveness. Our next result follows.

**Result 3a.** (Prediction of Market Competition). *Migrants are significantly more likely to predict a number of entries in excess of the market capacity than stayers with out-migration.*



**Result 3b.** (Prediction of Market Competition). *Stayers with no out-migration are significantly more likely to predict a number of entries in excess of the market capacity than stayers with out-migration.*

**Support for Result 3.** The right panel of Table 7 (specifications 4, 5 and 6) reports three specifications of a Probit model in which the dependent variable is the predicted market competitiveness. This variable is equal to 1 if the subject's predicted number of entrants is greater than the number of prizes for the round; otherwise it is 0. These regressions show that, controlling for the usual variables, migrants are 21% more likely to predict high competition than stayers with out-migration. Similarly, stayers with no out-migration are also 20% more likely to predict high competition than stayers with out-migration. We also observe that those who are more risk-loving under state uncertainty are more likely to expect market competitiveness.

These two sets of results suggest that migrants are more strategic uncertainty seeking, than stayers. Indeed, they are both more likely to predict the competitiveness of others and more likely to enter the competition.

## 1.5 Discussion

We have investigated preferences between three groups of subjects: migrants, stayers with and without out-migration, considering two sources of uncertainty: state and strategic uncertainty. Two key issues are raised by our investigation.

*Two types of stayers.* – We use stayers at locations with out-migration as the base group to compare with the other two groups. These stayers are the people who choose

not to migrate despite having easier access to information regarding migration (from their migrating neighbors) than stayers in locations where only very few people have migrated. Our results confirm the hypothesis that stayers with out-migration are less willing to enter a competition with strategic uncertainty than stayers without out-migration. In contrast, no difference has been found across groups in attitudes towards risk and ambiguity under state uncertainty.

*East China vs. West China.* – An interesting and robust finding in our data is that people who reside in East China are significantly more willing to take risks under state uncertainty and they are less inequality averse in the gain domain, regardless of whether they are migrants or local residents. As shown in Tables 6 and 7, the goodness-of-fit of all regression models improves dramatically after including the control variable *East*, indicating the variable's significance in explaining the data. When the economic reform started three decades ago, it was focused in East and South coasts of China (mainly Shanghai and Shengzhen), while the reform occurred at a much slower pace in West China. Therefore, people in East China have been exposed to market economy longer, and more comprehensively. We speculate that people in East China are more used to higher variance in opportunities and wealth, and migrants who moved from inland to East China are self-selected to be similar, or have adapted to the norms. This result is in line with prior findings that economic regime could reshape individuals' preferences (Ockenfels and Weimann, 1999; Alesina and Fuchs-Schundeln, 2007; Brosig-Koch *et al.*, 2011). Finally, it is important to note that this East-West difference does not change our main findings regarding

migrants *vs.* non-migrants differences as regards strategic uncertainty, as shown in Table 7.

## 1.6 Conclusion

We conducted the first incentivized field experiment to study whether migration decisions could be explained by risk attitudes, competitiveness, or both. We find that migrants are significantly more willing than non-migrants to enter a competition with strategic uncertainty; in contrast, people from different groups demonstrate identical attitudes towards risk and ambiguity under state uncertainty.

Our contributions are twofold. First, our results contribute to the debate on the relationship between risk preferences and migration propensity. As our results show, the answer is not straightforward, and depends on how the uncertainty is generated: does it involve other people's decisions? Competing with other participants seems to resonate with migrants well, as they take significantly more risk in this environment than non-migrants, whereas no behavioral difference is found between the two groups when the risks are generated via die rolls. Intuitively, this finding is consistent with the fact that migrants move to urban locations to enter the competition in the labor market.

Second, our results suggest that the conventional methodology of eliciting risk preferences using lists of lotteries is not one-size-fits-all. As a complementary tool, the market entry game used in this paper seems quite suitable when the outcome variables of interest involve human interactions, and especially competition. Our

paper takes a first step towards enriching the toolbox of incentivized preference elicitation methods in a way that might be useful for better understanding migration decisions.

With a quarter billion Chinese people migrating from rural to urban areas in the year 2013 alone, there is clearly significant policy importance tied to understanding determinants of migration decisions. Large-scale migration not only provides rich labor resources to businesses in more developed regions, but also ameliorates unemployment and enables rural populations to escape poverty. At the same time, the influx of large migrant populations into cities raises widespread concerns regarding the adequacy of health care, education and housing. An improved understanding of migration decisions, and the preferences of migrants, is a step towards designing policies that enable communities to realize the substantial benefits of migration at minimum social cost.

## Appendix 1. Survey used to qualify participants.

We thank you for participating in this survey that may allow you to participate in an experiment. This experiment is part of an international research program on risk. Not all of you will be able to participate in the experiment but you have a great chance to be invited.

Please take some time to answer the following questions honestly. Your answers will only be used in research and will be kept anonymously and confidentially for the sole use of the researchers conducting this survey. They will not be communicated to anybody outside the research investigators. None of your answers in this survey will be associated with your performance in the following games if you are chosen to be a participant in the games.

### 1. Local Address

Province \_\_\_\_\_ City \_\_\_\_\_ District (County) \_\_\_\_\_ Street \_\_\_\_\_

### Family Address

Province \_\_\_\_\_ City (County) \_\_\_\_\_ District (Town) \_\_\_\_\_ Street (Village) \_\_\_\_\_

2. Family name \_\_\_\_\_ Given name \_\_\_\_\_

3. Cell Phone \_\_\_\_\_ Fixed-line Telephone \_\_\_\_\_

4. Year of birth \_\_\_\_\_

5. Gender \_\_\_\_\_ (Male/Female)

### 6. Attained Highest Education Level

- A. Illiterate
- B. Junior School
- C. Middle School
- D. High School
- E. Vocational Secondary School
- F. Junior College
- G. Bachelor Degree or more (Master Degree, PhD)

7. Nationality \_\_\_\_\_

8. Marital status \_\_\_\_\_ (Married/Single)

9. How many children do you have? \_\_\_\_\_

10. Do you have close relatives (parents, children, uncles or taunts, nephews or nieces) who left their county to work or run business in another county?

- A. Yes                      B. No

If your answer is yes, how many people left their county to work or run business in another county? \_\_\_\_

11. Do you personally know neighbors who left this county to work or run business in another county?

- A. Yes                      B. No

12. Have you ever worked or run business in another county?

- A. Yes                      B. No

**If your answer is yes, please answer the following questions.**

13. How long in total have you worked or run business in other county in the past 10 years? \_\_\_\_\_  
years \_\_\_\_\_ months.

14. How long have you worked or run business in other county in 2009?  
\_\_\_\_\_ months (input 0 if you stayed in this county all along the year 2009).

15. Where did you work or run business outside this county the last time?

16. Why did you leave your hometown?

- A. It is difficult to find a job in hometown
- B. To increase the household income
- C. To learn new skills
- D. Parents or friends advised me to work outside
- E. Other reason, please write it down

---

*Thank you for your answers!*

## Appendix 2. Instructions (translated into and from Chinese)

We thank you for participating in this experiment that is part of an international research program on risk. During this experiment you can earn a considerable amount of money if you read the instructions carefully.

This experiment consists of 3 parts during which you will make many decisions. During this session, your earnings will be calculated in points with the following conversion rate:

$$1 \text{ point} = 1 \text{ RMB}$$

The earnings in points you will make during these parts will be determined only at the end of the session. At the end of the session, these earnings in points you will make in the various parts will be added up, converted into RMB and paid to you in cash and in private.

All your decisions are anonymous and confidential. Your decisions will be communicated only to the researchers involved in this research program.

Throughout the session, you are not allowed to communicate with the other participants. Be aware that if you communicate with others, you will be excluded from the session and from the payments.

If at any stage, you have any question, please raise your hand and research assistants will answer your questions.

### Part One

On the attached form, we will present you successively with two urns that contain each ten balls, either white or black. The urn X contains 10 balls: **5 white balls and 5 black balls**. The urn Y contains 10 balls, **both white and black balls, but you do not know the proportion of balls of each color**.

For each urn, you must make 10 successive choices between extracting a ball from the urn with replacement (there are always 10 balls in the urn) or earning a certain amount of money. **If you decide to draw a ball from the urn and you extract a black ball, you earn 10 points; if you extract a white ball, you earn 0 point**. The **10 certain amounts will vary between 1 point and 10 points**. Only one of these twenty decisions for two urns will matter for determining your earnings in this part, as explained below.

Please indicate on the attached form for each proposed choice if you prefer receiving the certain amount or extracting a ball from the urn.


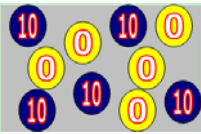
#### How do we determine your earnings in this part?

At the end of the session, you are requested to flip a coin to determine which urn will be actually used to determine your earnings (either the urn X or the urn Y). If the side has a tail on it, the urn X (with 5 black balls and 5 white balls) will be used. If the side has a head on it, the urn Y (with unknown number of black and white balls) will be used.

Next, for this urn, you will randomly draw a number between 1 and 10 to determine which of your 10 decisions will matter for determining your earnings.


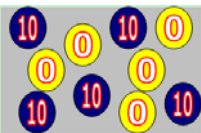
For this decision, if you have ticked “I choose the certain amount”, you will earn this amount. If you have chosen to extract a ball from the urn, you will extract the ball from the selected urn. If you extract a black ball, 10 points will be added to your other earnings from the experiment. If you extract a white ball, you earn nothing.

**Consider a first example.** Imagine that decision 4 in the urn X is selected:

<u>Decision Number</u>	<b>Option A</b> 	<b>Option B</b> <b>Urn X</b> 
<u>Decision 4</u>	<input type="checkbox"/> I choose to earn the certain amount of 4 points	<input type="checkbox"/> I choose to extract a ball from urn X



For this decision, suppose you have chosen option A. You will earn 4 points for sure.

**Consider a second example.** Imagine that decision 8 in the urn X is selected.

<u>Decision Number</u>	<b>Option A</b> 	<b>Option B</b> <b>Urn X</b> 
<u>Decision 8</u>	<input type="checkbox"/> I choose to earn the certain amount of 8 points	<input type="checkbox"/> I choose to extract a ball from urn X

Suppose that for this decision, you chose option B. You will draw one ball from urn X. If the ball color indicates black, you earn 10 points. If the ball color indicates white, you earn 0 point.

**Consider a third example.** Imagine that the urn Y is selected and decision 6 is selected.

<u>Decision Number</u>	<b>Option A</b> 	<b>Option B</b> <b>Urn Y</b> 
<u>Decision 6</u>	<input type="checkbox"/> I choose to earn the certain amount of 6 points	<input type="checkbox"/> I choose to extract a ball from urn Y



Suppose that for this decision, you chose option B. You will draw one ball. If the ball color indicates black, you earn 10 points. If the ball color indicates white, you earn 0 points.

If you have any question, please raise your hand and we will answer your question in private.

## Part Two

In this part, we form groups of two players, player X and player Y. Your earnings or losses depend on your decision or on the decision of another person and on a random draw.

You will make 16 successive decisions in the role of player X. In each decision, player X must choose a payoff distribution between himself and player Y. Player Y can only accept the payoff chosen by player X.

For each of the 16 decisions, you have to choose privately between option A (left column) or option B (right column). Every decision will have an equal chance to be chosen for actual payment at the end of the session, so you should make every decision seriously.

At the end of the session, we will match you with another person in this room. You will never be informed on the identity of the other person. Next, we will randomly draw your role and that of the other person such that there is one player X and one player Y in each pair.

Next, you will randomly draw a number between 1 and 16 to determine which of your 16 decisions will matter for determining your earnings or loss.

If you have been assigned the role of player X, you earn or lose the amount you have chosen for yourself in that decision. If you are assigned the role of player Y, you earn or lose the amount that player X with whom you are paired has chosen for person Y in this decision.

**Consider a first example.** Imagine that you have been assigned the role of player Y and that decision 3 is selected.

Option A Player X earns 3 and Player Y earns 3 <input type="checkbox"/> I choose option A	Option B Player X earns 8 and Player Y earns 2 <input type="checkbox"/> I choose option B
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If the player X has chosen option A, he/she earns 3 points and you earn 3 points. If the player X has chosen option B, he or she earns 8 points and you earn 2 points.

**Consider a second example.** Imagine that you have been assigned the role of player X and that decision 6 is selected.

Option A	Option B
Player X earns 6 and Player Y earns 6	Player X earns 8 and Player Y earns 2
<input type="checkbox"/> I choose option A	<input type="checkbox"/> I choose option B

If you have chosen option A, you earn 6 points and player Y earns 6 points. If you have chosen option B, you earn 8 points and player Y earns 2 points.

**Consider a third example.** Imagine that you have been assigned the role of player X and that decision 12 is selected.

Option A	Option B
Player X earns - 4 and Player Y earns - 4	Player X earns - 2 and Player Y earns - 8
<input type="checkbox"/> I choose option A	<input type="checkbox"/> I choose option B

If you have chosen option A, you lose 4 points and player Y loses 4 points. If you have chosen option B, you lose 2 points and player Y loses 8 points.

**Consider a fourth example.** Imagine that you have been assigned the role of player Y and that decision 16 is selected.

Option A	Option B
Player X earns - 8 and Player Y earns - 8	Player X earns - 2 and Player Y earns - 8
<input type="checkbox"/> I choose option A	<input type="checkbox"/> I choose option B

If the player X has chosen option A, he/she loses 8 points and you lose 8 points. If the player X has chosen option B, he or she loses 2 points and you lose 8 points.

If you have any question, please raise your hand and we will answer your questions in private. Any communication between participants is forbidden throughout the experiment.

### Part Three

In this part, there will be 3 sub-parts including totally 12 trials and the three sub-parts will be run one by one. Every sub-part involves a series of decisions about whether or not to go fishing. After completion of the whole session, one of the 12 trials will be randomly chosen for true payment.

There are eight trials in the first sub-part. You receive an initial endowment of 6 points in every decision. In all of the eight trials in this sub-part, we will announce a number C. C is the capacity of the














pond, i.e. the number of anglers who can catch fish. For example, if  $C=3$ , then the 3 highest-rank entrants will be successful (earn points) and lower-ranked entrants will be unsuccessful (lose points). In all of the eight decisions, the successful entrants earn some points and the unsuccessful entrants lose some points.

In each decision, your task is you decide simultaneously with other participants if you go fishing in the pond. In the eight trials, if you do not go fishing, then you earn nothing and lose nothing. Therefore, if you want to guarantee that you will lose nothing, simply do not go fishing. If you go fishing, then your payoff in points is determined by the payoff table shown on each form, and by your rank relative to the ranks of the other participants who decided to go fishing as you (as explained below).

In each trial, we will distribute one sheet indicating the capacity of the pond for the current trial and a payoff table. First, we ask you to estimate how many of the 11 other participants in this session (excluding you) you expect will go fishing in the pond. Next, you will indicate whether you decide to go fishing, by checking the appropriate box.

The following table gives you an example of the payoff table in a trial.

For example, suppose  $C$  (capacity of the pond) =4 and your initial endowment is 6 points:

 Pond Capacity=4	
Rank Level	Payoff
1	 +18
2	 +12
3	 +4
4	 +2
5	 -6
6	 -6
7	 -6
8	 -6
9	 -6
10	 -6
11	 -6
12	 -6

In the four rows above, payoffs are positive; in the remaining rows below, payoffs are always - 6

Please indicate the number of other participants you believe will choose to enter (a number between 0 and 11) \_\_\_\_\_

Please indicate your decision:  I enter    I stay out

Suppose that you have decided to go fishing in the pond. If you are the first highest-ranked among those participants who have decided to go fishing in pond, you earn 18 points. You earn 12 points if you are ranked second. You earn 4 points if you are ranked third; you earn 2 points if you are ranked fourth. If you are ranked fifth or more, you lose 6 points.

**How is your rank determined?**

Your rank is determined as follows. At the end of this session, if this trial is chosen for actual payment, we will prepare messages indicating the id number of participants who chose to enter and we will randomly assign messages to ranks. If the message indicating your id number is chosen first, you are assigned the highest rank; if the message indicating your id number is chosen secondly, you are

assigned the second highest rank. Like this, you will be assigned the lowest rank if the message indicating your id number is chosen lastly.

**How is your payoff determined in this part?**

At the end of the session, we will put 12 messages representing 12 trials in the three sub-parts, numbered from 1 to 12, in a bag. We will extract one message from the bag. Its number will indicate the number of the trial that will be paid. Because every trial has an equal chance of being chosen for payment, you should make every decision seriously.

In the trial that is chosen for actual payment, we determine your payoff as follows.

- If your prediction for the number of participants who go fishing in the pond is correct, you earn 2 points.
- We will calculate the number of participants who go fishing in the pond in this trial. If you have decided to go fishing in the pond, we determine your rank relative to the rank of the other participants who have chosen to fish as you. If your rank is less than or equal to the pond capacity,  $C$ , you earn points accordingly. If your rank level is more than the market capacity,  $C$ , you will lose points accordingly.
- Your total payoff is the sum of your initial endowment in this trial + your earnings for your correct predictions + the points earned from your fishing decision /or/ - the points lost from your fishing decision in this trial.

If you have any question, please raise your hand and we will answer your questions in private. Any communication between participants is forbidden throughout the experiment.

# Essay 2

## Saving Face: An Experiment on Image and Group Identity<sup>1</sup>

### 2.1 Introduction

The concern for one's and other's image is crucial for diplomacy, informal contract enforcement, maintenance of business networks, good employment relationships, successful bargaining situations (Ting-Toomey, 2005). Yet, individuals or organizations' image may be threatened by the development of practices like the dissemination of performance rankings that praise the best performers but may also shame the least performers. Examples include school quality rankings, citation indices and rankings in academia, ranking of sellers on on-line purchasing websites, employee performance evaluations in organizations.<sup>2</sup> While rankings may motivate

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<sup>1</sup> This chapter is a joint work with Tor Eriksson and Marie Claire Villeval. We acknowledge the financial support by a grant from the French National Research Agency (ANR, EMCO program, HEIDI grant) and was performed within the framework of the LABEX CORTEX (ANR-11-LABX-0042) of Université de Lyon, within the program "Investissements d'Avenir" (ANR-11-IDEX-007) operated by the French National Research Agency (ANR).

<sup>2</sup> Many firms struggle to find a well-functioning performance evaluation system. Recently, well-known companies have abolished their annual performance review (Adobe) or moved from a rigid,

individuals with competitive preferences to outperform others, they may also generate losses of utility in terms of image and a decrease of efficiency. Indeed, individuals who lose face may be less willing to identify with the company and they may focus on activities that threaten less their face.

If individuals and organizations make efforts or sort themselves from certain situations to protect their own image, it is, however, less obvious whether they are willing to sacrifice resources to save other's face. Social psychologists have shown how preserving image is important for humans in society (Spencer *et al.*, 2001; Baumeister *et al.*, 2005; Mruk, 2006). Sociologists have studied how self-esteem and considerateness for others lead people to preserve self- and others' face in social encounters. In particular, Goffman has defined face as "an image of self delineated in terms of approved social attributes" (2005, p.5), and shown that face-saving practices are a condition for social interactions. In contrast, economists have not widely explored the importance of face-saving for the self and others.<sup>1</sup> This study aims at contributing to its understanding by combining the economic analysis of image and social preferences. Behavioral economics has recently incorporated self-image in economic modeling as a dimension of ego utility (Benabou and Tirole, 2002, 2006; Koszegi, 2006). These models and empirical tests of image concern

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forced ranking approach to systems that are considerably more flexible (Microsoft, Yahoo). One aspect of these evaluation policies that are not recognized in the literature is the loss of face (self- as well as others' image) associated with performance evaluations in which individuals' ranks are publicly exposed.

<sup>1</sup> An exception is Hugh-Johns and Reinstein (2010) who study loss of face as the disutility for common-knowledge of rejection. The fear of losing face leads to inefficiencies in markets that involve notably matching because it leads to fewer offers.

(Johansson-Stenman and Svedsater, 2012; Johansson-Stenman and Martinsson, 2005; Alpizar *et al.*, 2008; Ariely *et al.*, 2009; Lacera and Macis, 2010; Cappelen *et al.*, 2012) demonstrate that individuals care about how others perceive their actions. People are motivated by what others think about them and appreciate being paid respect (Ellingsen and Johannesson, 2007, 2008a; Erikson and Villeval, 2011). These studies, however, do not explore directly the value for individuals to maintain self- and others' face in public.

The contribution of our paper is four-fold. Firstly, we study experimentally whether people sacrifice monetary resources to avoid being publicly exposed –to save face - when exposure signals that the individual's performance in a task is the lowest compared to others, in an environment where not exerting effort is the equilibrium. We do not intend to measure the precise value of face-saving but whether or not individuals use the opportunity to avoid exposure. Secondly, we analyze how large is the share of individuals who accept incurring costs to save the face of others without reaping any personal material benefit from this action. In our context, this behavior cannot be explained in terms of inequity aversion or reciprocity. It can be related to altruism (Andreoni and Miller, 2002) and norm enforcement to maintain the integrity of a society (Fehr and Fischbacher, 2003) in the non-pecuniary domain of image and esteem.

Thirdly, we investigate whether group identity strengthens the willingness to preserve self- and others' image. In general the link between individual and group identity, on the one hand, and face, on the other hand, has been little explored in the



literature (Spencer-Oatey, 2007).<sup>1</sup> In our perspective, are individuals who belong to the same group as their triad members more willing to pay for saving their face and the face of others, compared to individuals who are matched with out-groups? By addressing these questions, we contribute to the recent economic literature on group identity (Akerlof and Kranton, 2000; Bowles and Gintis, 2004; Fershtman and Gneezy, 2001; Bernhard *et al.*, 2006; Charness *et al.*, 2007; Chen and Li, 2009; Hargreaves Heap and Zizzo, 2009; Zizzo, 2011; Goette *et al.*, 2012; Masella *et al.*, 2012).

A fourth contribution of our paper is examining how effort is affected both by the threat of public exposure and by exposure itself. *Ex ante*, does the threat of public exposure boost performance to avoid exposure? For example taxpayers are more compliant when detection of fraud leads to the public display of the evaders' pictures because of anticipatory shame emotions (Coricelli *et al.*, 2010, 2013). On the other hand, we know that the threat of monetary sanctions by principals in case of insufficient effort may crowd-out workers' intrinsic motivation (Gneezy and Rustichini, 2000; Dickinson and Villeval, 2009). We study whether this also applies to threats on image. *Ex post*, does the shaming effect of public exposure crowd-out or crowd-in intrinsic motivation? Indeed, individuals may either work harder to restore their image or less hard if their intrinsic motivation has been altered. By interacting this analysis with group identity, we also contribute to the understanding of how identity influences the efficiency of incentives schemes on performance in the presence of image concerns (Masella *et al.*, 2012).

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<sup>1</sup> According to Spencer-Oatey (2007), face is associated with positively-valued attributes that are affectively sensitive and it is associated with value judgments, which differs from identity.

Testing face saving would be very difficult by means of survey or registry data. Therefore, we have designed a novel laboratory experiment that allows us to test behavioral conjectures derived from a model inspired by Benabou and Tirole (2002) in which utility depends on extrinsic, intrinsic and image motivation. Participants are matched in triads and have to perform a real-effort task for a fixed payment. In one part those whose performance is lowest in their triad are singled out and briefly publicly exposed. Although the equilibrium is not exerting any effort, public exposure may be perceived as signaling laziness or low ability more than rationality. The lift of anonymity is therefore susceptible to shame individuals who are exposed,<sup>1</sup> although we kept the procedure as soft as possible to avoid creating too much embarrassment. Public exposure can be avoided if at least two triad members pay a fee. This allows us to measure the likelihood of sacrificing resources to save one's and others' image. In some treatments, we induce minimal group identity as in social psychology (Tajfel *et al.*, 1971; Tajfel and Turner, 1979). In the Homogenous treatment, the triad members share the same group identity, while in the Heterogeneous treatment, group identities are mixed within each triad. This allows us to measure how image management is affected by group identity and diversity in the composition of triads. Moreover, use of real effort enables us to identify whether threats on image are crowding-in or crowding-out effort and whether this effect is modified by group identity.

We conducted this experiment with 360 volunteers in China. Indeed, the concept of face (*mien-tzu*) originates from China (Ho, 1976) where it is considered as a key

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<sup>1</sup> In psychology, Smith *et al.* (2002) have shown that shame has two core features: its links with public exposure and with negative self-evaluation.

dimension in the Confucian culture to orchestrate daily life, economic and social interactions (Hu, 1944; Redding and Ng, 1982; Yang, 1989; Qi, 2011).<sup>1</sup>

We have four main findings. First, most individuals strive to save face and avoid public exposure. Second, more than half of the participants sacrifice some of their own material interest to avoid others' exposure. Third, introducing group identity makes little difference with the Baseline in the choice to save one's and other's face, except in the Heterogeneous treatment where the best performer is more likely to help an in-group than an out-group. This suggests that preserving other's face is a strong norm and that in-group favoritism could be perceived itself as a violation of a social norm (Harris *et al.*, 2012). This is also supported by the fact that those who believe that the two other triad members chose to pay the fee are more likely to pay the fee themselves, although this is inefficient. Fourth, while effort is boosted by the perspective of being ranked and by the threat of exposure, we find some (weak) evidence that having been exposed tends to crowd-out the intrinsic motivation to perform in the future. While happiness has been shown to increase productivity (Oswald *et al.*, 2014), we show that shame tends to decrease it. Overall, these findings deliver recommendations on the importance of protecting people's face and avoiding modes of evaluation or feedback policies that threaten social image.

In the remainder of the paper, Section 2 summarizes the related literature. Section 3 describes the experimental design and procedures. Section 4 presents a model and

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<sup>1</sup> The concern of Chinese for face results from a socialization process using shaming techniques to inculcate strong sensitivity to group belonging and others' opinion (Redding and Ng, 2002). The concern for others' image is called "giving face" in Chinese.

behavioral conjectures. Section 5 reports our findings and Section 6 discusses the results and concludes.

## 2.2 RELATE LITERATURE

Our paper contributes to three literatures. One includes studies of identification and audience effects. While identification affects pro-social choices (Bohnet and Frey, 1999; Charness and Gneezy, 2008), we focus instead on how pro-sociality influences identification. Regarding audience, punishment in public promotes norm obedience (Xiao and Houser, 2011) and anticipated verbal feedback increases pro-social behavior (Ellingsen and Johannesson, 2008b). While these studies ensure the anonymity of interactions, our design exposes singled-out individuals to an audience. The presence of a non-anonymous audience has been shown to increase pro-sociality (Ariely *et al.*, 2009), tax compliance (Coricelli *et al.*, 2010, 2013), coordination on the audience's preferred outcome in the battle-of-sexes game and defection in the prisoner's dilemma (Charness *et al.*, 2007), and inflation of stated self-assessment (Ewers and Zimmerman, 2012). These studies point to the importance of social approval.<sup>1</sup> Our analysis complements them by examining whether public exposure of performance rank is perceived as a threat and affects effort as well as the willingness

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<sup>1</sup> There is also a literature on the disclosure of personal information in economic transactions and on the willingness-to-pay for privacy, showing that people are less willing to disclose personal information when information is more sensitive (Feri *et al.*, 2013), when there is less control over the publication of data (John *et al.*, 2009), or in the absence of economic advantage associated with disclosure (Beresford *et al.*, 2012). While we are also concerned with the privacy of sensitive data, we differ from this literature in which disclosure is voluntary.

to preserve one's and others' image.

Second, we contribute to the literature on group identity. In naturally occurring groups, in-group favoritism has been observed in norm enforcement (Bernhard *et al.* (2006) because of social ties (Goette *et al.*, 2006, 2012a). Discrimination of the opposite group has been identified both in dictator games (Ben-Ner *et al.*, 2009; Abbink and Harris, 2012) and competition games (Goette *et al.*, 2012b; Kato and Shu, 2013). Using the minimal group paradigm, studies have shown that group identity strengthens pro-social behavior (Chen and Li, 2009) while individuals behave more selfishly when opposed to out-groups (Kollock, 1998; Charness *et al.*, 2007; Zizzo, 2011), and that trust decreases with group membership because of discrimination against out-groups (Hargreaves Heap and Zizzo, 2009).<sup>1</sup> Our contribution to the previous literature is that we aim at determining whether face saving is a general norm or a discriminatory process conditional on the social distance with the potential victim.

Third, we contribute to the literature on the incentive effects of social status in organizations. Status can be conferred by public recognition, performance feedback and ranking. These measures act as incentives on effort (Kosfeld and Neckerman, 2011; Kuhnen and Tymula, 2012; Tran and Zeckhauser, 2012; Bradler *et al.*, 2013) and cooperation (Eckel *et al.*, 2010), although their effect is not unequivocal (Barankay, 2012; Charness *et al.*, 2014). We complement these studies by singling-out

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<sup>1</sup> This is not systematic, however, as the impact of group identity on behavior is conditional on the saliency of identity (Eckel and Grossman, 2005), the procedure used to generate identity (Guala *et al.*, 2013), the group size (Harris *et al.*, 2009), the mode of group formation (Herbst *et al.*, 2012), the existence of inter-group conflicts (Chakravarty and Fonseca, 2011), and culture (Buchan *et al.*, 2009).

least productive individuals to examine the impact of decreased social status on further performance.<sup>1</sup> By introducing group identity we also contribute to study whether social distance modifies the incentive effect of social status on effort. For example, Masella *et al.* (2012) found evidence of hidden costs of control both in within-group pairs (because control signals distrust) and in between-group pairs (where it signals hostility). In our case, we can analyze whether the threat of public exposure increases the effort of individuals more when they are matched with out-groups than with in-groups if they believe that out-groups are less likely to save their face.

## **2.3 EXPERIMENTAL DESIGN AND PROCEDURES**

### *2.3.1 Treatments*

The experiment consists of three main treatments: a Baseline treatment and two treatments in which we induce group identity and manipulate the composition of teams in terms of group affiliation. A control treatment has been added in which we prime group identity but give no information about the group affiliation of team members.

#### *Baseline treatment*

The Baseline treatment has been designed to provide evidence on whether individuals

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<sup>1</sup> Galeotti and Zizzo (2012) also analyze singling-out in a trust game in which it is random or it results from others' preferences. Solo identity reduces trustworthiness and majority group members discriminate singled-out subjects. There is also a large literature in psychology on singling out, inclusion and exclusion; see Abrams *et al.* (2004).

care about their own image and about the image of others. At the beginning of a session, we randomly form triads. Participants remain paired with the same two co-participants for the entire session. Each session consists of four parts (see instructions in Appendix). In each part, participants have to perform a simple task during four minutes. More precisely, they have to pick an apple on the screen and move it into a collecting basket located at the bottom of the screen. As soon as an apple enters the basket, a new apple appears at a random spot on the screen. Each apple moved into the basket earns one point. A counter displays the current score. Since the task does not require any specific cognitive skill, the score constitutes a proxy of the level of effort and no evidence of learning-by-doing across parts is expected.<sup>1</sup> Participants receive a fixed wage of 100 ECU (Yuan 10, about U.S. \$1.65) in each of the four parts, regardless of their performance.

Parts differ from each other in terms of feedback and risk of exposure. At the end of part 1, participants only learn their own score. At the end of parts 2 and 3, they are informed about the score and the rank of each member in their triad, with rank 1 assigned to the best performer and rank 3 to the least performer. In case of ties, ranks are assigned randomly between the ties. At the end of part 3, once triad members have been informed on ranks, participants with rank 3 are requested to move to the front of the room one by one before coming back to their seat. These rules are made common information in the instructions. Public exposure can, however, be waived if at least

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<sup>1</sup> Using a task in which a low performance would signal low cognitive ability would have generated more embarrassment in case of exposure, which we wanted to avoid for ethical reasons. Thus, the intensity of shame due to public exposure in a professional or educational environment is probably underestimated in our experiment.

two triad members choose to pay to avoid the public exposure of the member with rank 3. In this case, 10 ECU are deducted from the payoff of those who chose to pay. If less than two triad members chose to pay the fee, the member with rank 3 is publicly exposed and no deduction is made. Each member is informed about which triad member offered to pay and who did not. Finally, part 4 replicates the features of part 2: after performing the task again during five minutes, subjects are informed on the score and rank of each triad member.

Comparing performance in part 1 and in part 2 determines whether individuals adjust effort in the anticipation of being informed about their relative performance. Comparing performance in part 2 and in part 3 indicates whether the perspective of being publicly exposed boosts effort or crowds-out intrinsic motivation. Finally, comparing performance in parts 3 and 4 measures whether exposure in part 3 has a detrimental effect on the effort exerted in part 4, and whether the solidarity among triad members to avoid exposure boosts effort.

We elicited the emotional state of the participants by using a self-reported emotion survey as in Hopfensitz and Reuben (2009). At each step of the experiment,<sup>1</sup> participants report the intensity of ten emotions that they may experience at this precise moment (anger, contempt, shame, envy, sadness, happiness, guilt, gratefulness, fear, relief) on a Likert-type scale from 1 (indicating the lowest possible intensity) to 7 (for the highest possible intensity). We are chiefly interested in the feelings of shame

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<sup>1</sup> Specifically, we elicited the participants' emotional intensity six times: at the beginning of the session, after receiving feedback at the end of part 1, at the end of part 2, during part 3 after choosing to pay to avoid public exposure, after the exposure of the worst performers, and finally at the end of part 4.



and happiness. The purpose of displaying the other emotions is to avoid a too strong focus of the participants' attention on shame and happiness.

#### *Homogeneous/Heterogeneous Group Identity treatments*

To explore whether the willingness to save others' face depends on sharing a similar group identity, we have designed two conditions of a group affiliation treatment. In the homogeneous group condition (hereafter, "Homogenous treatment"), triads are formed of participants who share the same group affiliation; in the heterogeneous group condition (hereafter, "Heterogeneous treatment"), they are formed of participants who have different group affiliations.

Group identity is induced in a preliminary part, using the minimal group paradigm (Tajfel, 1971). Group affiliation is held constant throughout the session. This part consists of two stages. In the first stage, subjects are randomly assigned to one of two groups of similar size, named the Kandinsky group and the Klee group, respectively. In the second stage, participants engage in a recognition task. They review five pairs of paintings created by Klee and Kandinsky respectively, during 20 seconds each. The screen indicates which artist painted each painting. Next, they review two anonymous paintings successively and they are requested to report which artist painted each of them (Klee or Kandinsky). Each correct answer pays 50 ECU. Before entering responses, participants can communicate with their in-groups during three minutes by means of a chat box. They receive a feedback on the correctness of answers at the end of the session.

Once group identity has been induced, the rest of the experiment is similar to the

Baseline treatment except that individuals are aware of the composition of their triad in terms of group identity and that publicly exposed individuals have to indicate aloud the name of their group. This aims at reinforcing the feeling of group identity.

#### *Priming treatment*

One objection one could have is that if behavior differs in the Baseline and in the Group Identity treatments, this may be due not to group identity but to the priming of a collective spirit and helping attitude in the preliminary part. To separate the two effects, in a control treatment we generate group identity but participants do not receive information about the group affiliation of their triad members. If the willingness to pay for avoiding public exposure in this treatment is similar to that in the Group Identity treatments and higher than in the Baseline, then we could conclude that it is driven by the priming of cooperation and not by group affiliation.

#### *Belief elicitation*

Requiring that two out of three triad members pay the fee to avoid public exposure raises a coordination problem. To better understand what motivates individuals to pay or not the fee, we elicited the participants' beliefs about the number of other triad members who will choose to pay the fee (0, 1 or 2). This question was asked just after the individuals made their decision in part 3 and it was not mentioned in the instructions to avoid focusing attention on the coordination issue. A correct prediction paid 50 ECU. This question has been introduced in the last 12 sessions.

#### *2.3.2 Procedures*

The experiment was conducted at the experimental laboratory of Beijing Normal

University, Beijing, China. Posters inviting students to participate were posted on online campus forums of Beijing Normal University and Beijing University of Posts and Telecommunications and flyers were distributed on the campuses. In total 360 students from various disciplines participated in 20 sessions with 18 participants in each. The Baseline treatment was implemented in four sessions, the Homogenous and the Heterogeneous treatments in seven sessions each, and the Priming treatment in two sessions. Table 1 reports the descriptive statistics of participants by session and treatment. The proportion of female participants exceeds 50% (binomial test,  $p < 0.001$ ), with variations across sessions. We control for a possible gender effect in the regression analysis.

Table 1. Summary of sessions

Number Session	Treatments	Elicitation of beliefs	Number of participants	Mean age (years)	Female ratio (%)
1	Homogenous	No	18	21.33	55.56
2	Baseline	No	18	21.78	77.78
3	Homogenous	No	18	21.22	83.33
4	Heterogeneous	No	18	22.11	77.78
5	Baseline	No	18	22.39	94.44
6	Heterogeneous	No	18	21.44	55.56
7	Homogenous	No	18	23.06	77.78
8	Heterogeneous	No	18	22.28	88.89
9	Heterogeneous	Yes	18	22.33	72.22
10	Heterogeneous	Yes	18	22.67	66.67
11	Baseline	Yes	18	22.00	94.44
12	Baseline	Yes	18	22.78	72.22
13	Homogenous	Yes	18	21.78	66.67
14	Homogenous	Yes	18	22.11	77.78
15	Priming	Yes	18	22.56	66.67
16	Priming	Yes	18	21.83	61.11
17	Heterogeneous	Yes	18	22.56	66.67
18	Heterogeneous	Yes	18	22.39	72.22
19	Homogenous	Yes	18	22.50	61.11
20	Homogenous	Yes	18	21.39	88.89

The experiment was computerized using the REGATE software. Upon arrival, participants were randomly assigned to a computer terminal. Talking was not allowed. Instructions were distributed and read aloud after completion of each part. We checked that each participant understood correctly the instructions and all questions were answered in private. Before the beginning of the first part, participants were allowed to practice the task during two minutes to eliminate learning effects during the rest of the session.

Each session lasted on average about 90 minutes, including a final demographic survey and payment. The privacy of payoffs was assured. Participant earned on average 45 Yuan (\$7.38), which corresponds to approximately a 90 minute-wage for a part-time job in Beijing.

## **2.4 BEHAVIORAL CONJECTURES**

Predictions based on standard theory with selfish preferences and purely extrinsic motivation are straightforward. Since individuals are paid a fixed wage, they should exert no effort in any part. The threat of exposure should not affect effort since exposure does not impact payoffs. Exposure should only express rationality. Individuals should not pay to avoid exposure since it reduces their earnings. These predictions hold for all treatments and conditions.

Another theoretical framework is needed to account for intrinsic motivation and image concerns. Our model is inspired by Benabou and Tirole (2006). Individual  $i$ 's utility depends on three main elements: his extrinsic motivation (the monetary payoff

$y$  valued at  $v_y$ , which in our case is independent of effort), his intrinsic motivation (the satisfaction of exerting the task, valued at  $v_e$ ), and his image motivation ( $R_i(\cdot)$ ). Utility is also affected by the cost of providing effort (with  $C(e_i)$  being a convex cost function) and the fixed cost of preserving image if the individual actually pays the fee,  $K$ , to avoid the exposure of the least performer. We define the individual  $i$ 's utility function as follows:

$$U_i(e_i, s_i) = yv_y + e_iv_e - C(e_i) - R_i(\cdot) - K(R_i(\cdot)) \quad (1)$$

where  $e_i$  denotes the level of effort and  $s_i$  the decision to pay the fee. This covers three possible situations:

$$\begin{cases} U_i(e_i, s_i) = yv_y + e_iv_e - C(e_i) & \text{if } i \text{ has no image concern} \\ U_i(e_i, s_i) = yv_y + e_iv_e - C(e_i) - R_i(\cdot) & \text{if } i \text{ suffers from a player's exposure and less than} \\ & \text{2 players are willing to pay the fee} \\ U_i(e_i, s_i) = yv_y + e_iv_e - C(e_i) - K & \text{if } i \text{ and another player pay the fee for avoiding} \\ & \text{a player's exposure} \end{cases}$$

The individual cannot at the same time have to pay the fee ( $K$  is charged only if the public exposure of the least performer is waived) and suffer an image loss. The image utility function  $R_i(\cdot)$  enters negatively the individual's utility because we assume that the public exposure of the least performer entails a loss of image.<sup>1</sup> It is equal to the value of this image loss for an image-concerned individual if less than two triad members are willing to pay the fee. There is no image utility loss if the individual has no image concern or if exposure is waived. The image utility function can be written as follows:

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<sup>1</sup> Without loss of generality, we assume that image motivation is independent of the individual's type (*i.e.* of the respective weight of extrinsic and intrinsic motivations). Indeed, an individual who exerts no effort because he has no intrinsic motivation may still suffer from being publicly exposed.

$$R_i(.) = \alpha_i E_i(s_i, s_{j,k}, s'_i | e_i < e_{j,k}, K) + \beta_i E_i(s_i, s_{j,k}, s'_i | e_i > e_j, e_j < e_k, K) \quad (2)$$

with  $\alpha_i \geq \beta_i \geq 0$

The first term in (2) represents the loss of utility in terms of image in case  $i$  is publicly exposed, while the second term represents the loss of utility for  $i$  if another triad member,  $j$ , is publicly exposed. The importance of the loss of utility for  $i$  depends on whether  $i$  or another triad member is exposed.  $i$  suffers a loss  $\alpha_i$  if he is publicly exposed, with  $\alpha_i = 0$  if he has no concern for image. He suffers a loss  $\beta_i$  if another triad member is exposed, with  $\beta_i = 0$  if he is indifferent to other's fate.<sup>1</sup> We assume that individuals are likely to suffer more from the loss of their own image than from the loss of another's image ( $\alpha_i > \beta_i$ ). The loss of utility for  $i$  is a function of his decision to pay the fee,  $s_i$ , of the decision of each other triad member,  $s_{j,k}$ , and of  $i$ 's belief about the number of other triad members who are willing to pay the fee,  $s'_i$ , conditional on  $i$ 's relative performance and on the amount of the fee. Indeed, beliefs matter as exposure avoidance requires that at least two players are willing to pay.

The individual  $i$  maximizes his utility over the level of  $e_i$  and the decision to pay the fee  $s_i$  for avoiding exposure of the least performer. He forms a belief about the decisions of his triad members and he compares the amount of the fee to the image loss he would suffer in case of public exposure, conditional on his relative performance.

Based on eq. (1) and (2), we can write our first three behavioral conjectures.

*Conjecture 1.* Image-concerned individuals pay the fee to avoid public exposure. This

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<sup>1</sup> In the model, we disregard gloating ( $\beta_i < 0$ ). We do not ignore that it may exist in real settings. We found no evidence of it in the emotions reported by the participants in our experiment (see Figure 2).

is the case if the amount of the fee,  $K$ , is lower than the utility loss from exposure, except if the individuals believe that the other triad members will pay the fee. This holds if people have sufficient concern for self- and others' image.

*Conjecture 2.* There are more individuals for whom  $a_i > \beta_i$  than individuals for whom  $\beta_i > \alpha_i$  (i.e., they are more likely to pay the fee for avoiding their own exposure than the exposure of another member).

*Conjecture 3.* Individuals' level of effort increases in the degree of intrinsic motivation,  $v_e$ , and in the image cost of public exposure, conditional on being more concerned with one's exposure than with the exposure of other triad members ( $a_i > \beta_i$ ). Indeed, if  $i$  suffers the same utility loss from the exposure of any member in the triad, he should not try to outperform others since he would impose a negative externality on them. Thus, we conjecture that mean effort is higher in part 3 than in parts 1, 2, and 4 where there is no risk of exposure.

Introducing group identity in the model may affect both the value of  $\beta_i$  (increasing it when the individual is matched with in-groups and decreasing it when he is matched with out-groups) and the beliefs of the player regarding others' willingness to pay the fee. Indeed, the public exposure of an in-group can generate a negative externality on the individual's image. Group identity may also help solving the coordination problem regarding who should pay the fee in heterogeneous triads. Conditional on  $\beta_i > 0$ , we predict that an individual is more (less, respectively) likely to pay the fee when the least performer is an in-group (out-group, respectively) and the other triad member is an out-group. In homogenous triads, the prediction is

indeterminate: indeed, the willingness to pay the fee may be increased by the negative externality of an in-group's exposure but it may also be reduced by the incentive to let the two other in-groups pay the fee. We state the next two following conjectures:

*Conjecture 4.* The composition of the triad in terms of group identity influences the willingness to pay the fee through both the degree of sensitivity to the loss of image and the beliefs on others' willingness to pay. We expect that individuals with image concerns are more willing to pay the fee when the threatened subject is an in-group and the other member is an out-group. The effect is indeterminate in the Homogenous treatment.

*Conjecture 5.* Being matched with one or two out-groups boosts effort to increase the negative externalities of effort on out-groups and reduce the risk of being personally exposed. Thus, mean effort is expected to be higher in the Heterogeneous than in the Homogenous treatment.

## **2.5 RESULTS**

We first examine the decision to pay for avoiding public exposure. Next, we focus on the emotions reported by the participants and finally, we study the effort levels.

### *Avoidance of public exposure*

Table 2 displays summary statistics for the payment of the fee to avoid the public exposure of the least performer, by treatment and by performance rank in the triad in part 3. The last column gives the percentage of least performers who are actually exposed.



Table 2 shows that on average, 75% of the least performers in the Baseline are willing to pay to avoid being publicly exposed. This percentage is 80.95% in the Homogenous treatment, 71.43% in the Heterogeneous treatment, and 66.67% in the Priming treatment. Proportion tests indicate that these values do not differ from the Baseline (two-sided,  $p=0.569$ ,  $0.754$ , and  $0.599$ , respectively). Thus, most individuals have a concern for self-image, which gives support to Conjecture 1.

Table 2. Percentages of participants paying the fee to avoid the public exposure of the least performers, by treatment and by performance rank, and actual exposure

Treatment	Rank 1 in part 3	Rank 2 in part 3	Rank 3 in part 3	% of least performers exposed
Baseline treatment	54.17% (13/24)	54.17% (13/24)	75.00% (18/24)	37.50% (9/24)
Homogenous treatment	50.00% (21/42)	66.67% (28/42)	80.95% (34/42)	28.57% (12/42)
Heterogeneous treatment	57.14% (24/42)	54.76% (23/42)	71.43% (30/42)	33.33% (14/42)
- KkK or kkK	33.33% (3/9)	44.44% (4/9)	66.67% (6/9)	44.44% (4/9)
- Kkk or kKK	69.23% (9/13)	61.54% (8/13)	69.23% (9/13)	30.00% (6/13)
- KkK or kKk	60% (12/20)	55% (11/20)	75% (15/20)	20% (4/20)
Priming treatment	83.33% (10/12)	58.33% (7/12)	66.67% (8/12)	33.33% (4/12)
Total	56.67% (68/120)	59.17% (71/120)	75% (90/120)	32.5% (39/120)

*Note:* “K” is for the Kandinsky group, “k” for Klee group. “KkK or kkK” reads as follows: in the triad, the participants who get the first and the second ranks have the same group identity (in-groups) while the least performer has another group identity (out-group).

Table 2 also shows that in the Baseline a majority of individuals who are not personally at risk of public exposure (54.17% of both the best and the medium performers) choose to pay to waive the exposure of the least performer in their triad. This documents the importance of saving others’ face, which also contributes to support Conjecture 1. In the treatments with group identity, the share of persons choosing to pay to waive others’ exposure is always at least equal to or higher than 50%, which is not significantly different from the percentage in the Baseline (pairwise comparisons, proportion tests,  $p>0.100$ ). Being in a triad with in-groups or with

out-groups leads to a similar proportion of individuals' decision to pay the fee for others. As a consequence, the proportion of least performers who are actually publicly exposed varies between a minimum of 28.57% in the Homogenous treatment and a maximum of 37.50% in the Baseline ( $p>0.100$ ). Regarding beliefs, the individuals are, however, more pessimistic about others' willingness to pay the fee when they are matched with out-groups rather than with in-groups.<sup>1</sup>

Proportion tests indicate that the least performers choose to pay the fee more frequently than others (one-sided,  $p=0.044$  in the Baseline,  $p=0.006$  in the Homogenous treatment, and  $p=0.046$  in the Heterogeneous treatment; however,  $p=0.601$  in the Priming treatment). Not surprisingly, individuals are more likely to incur a cost for avoiding their own exposure than for waiving the exposure of another member (*i.e.*,  $\alpha_i > \beta_i$  in our model notations). The least performers hold also more pessimistic beliefs about the number of triad members who choose to pay.<sup>2</sup>

Next, we report an econometric analysis of the determinants of the decision to pay the fee. Table 3 contains the estimates of six Probit models in which the dependent variable is the decision to pay the fee to prevent the public exposure of the

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<sup>1</sup> The mean beliefs about the number of other triad members choosing to pay the fee are 1.36 (S.D.=0.68) in the Baseline, 1.42 (S.D.=0.73) in the Homogenous treatment, 1.11 (S.D.=0.74) in the Heterogeneous treatment, and 1.36 (S.D.=0.80) in the Priming treatment. Beliefs differ significantly between the Heterogeneous treatment on the one hand and the Baseline ( $p=0.096$ ) and the Homogenous treatment ( $p=0.010$ ) on the other hand (Mann-Whitney tests with each participant taken as one independent observation).

<sup>2</sup> The mean beliefs of the least performers are 1.08 (S.D.=0.67) in the Baseline, 1.25 (S.D.=0.79) in the Homogenous treatment, 0.87 (S.D.=0.74) in the Heterogeneous treatment, and 1.0 (S.D.=0.85) in the Priming treatment. They are significantly more pessimistic than the other subjects' beliefs in the Baseline ( $p=0.070$ ), the Heterogeneous treatment ( $p=0.057$ ) and the Priming treatment ( $p=0.052$ ) (Mann-Whitney tests).

least performer. In model (1), the independent variables include a dummy variable for each treatment, with the Baseline taken as the reference category. They also include two dummy variables indicating whether the participant has got the first or the second rank, respectively, with the last rank taken as the reference. Gender is captured through the “Male” variable and two variables that interact gender with the first and second ranks, respectively. These interaction terms allow us to separate the effects of gender on the willingness to protect one’s image and on the willingness to help others. Our estimation shows that the treatment variables are not significant. To check that this is not due to a failure of our manipulation to induce group identity, we estimate model (2) that augments model (1) with a “Group feeling” variable. This variable is the self-reported intensity of group identity in the Homogeneous and Heterogeneous treatments, from 1 for an absence of feeling to 7 for an intense feeling of belonging to the Klee or Kandinsky group.<sup>1</sup>

Model (3) augments model (2) with four variables related to the composition of the triad in terms of group identity in the Heterogeneous treatment. The “Matched with two out-groups” variable means that the subject does not hold the same group identity as the other triad members. The “Rank 1 with in-group rank 3” (“Rank 2 with in-group rank 3”, resp.) variable indicates that the participant has got the best rank (medium rank, resp.) and his only in-group is the participant who risks public exposure. The “Rank 3 with one in-group” variable indicates that the participant risks

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<sup>1</sup> The mean feeling is 5.01 (S.D.=1.79) in the Homogenous treatment and 5.05 (S.D.=1.59) in the Heterogeneous treatment. A Kolmogorov-Smirnov test indicates that there is no significant difference in the distribution of membership feelings between the Homogenous and the Heterogeneous treatments ( $p=0.672$ ).

public exposure and he has one in-group in the triad. Thus, the reference category corresponds to the participants with rank 1 or 2 whose *only* out-group is the least performing triad member. This decomposition allows us to identify which configuration generates more solidarity. Model (4) augments model (3) with variables related to the beliefs about the number of triad members (0, 1 or 2) who choose to pay the fee. The aim is to test whether participants try to solve a coordination problem, *i.e.* whether they are (i) more likely to pay the fee when they believe that one other triad member will pay and (ii) less likely to pay it when they believe that two other members will pay. Model (5) is similar to model (4), except that it excludes the “Group feeling” variable. Finally, model (6) re-estimates model (4) on the sub-sample of participants who have got rank 1 or rank 2. Table 3 displays the marginal effects of these variables.

Table 3. Determinants of the decision to pay the fee to avoid the public exposure of the least performer

Dependent variable: Decision to pay the fee	Probit models					
	(1)	(2)	(3)	(4)	(5)	(6)
Homogenous treatment	0.059 (0.071)	-0.145 (0.118)	-0.156 (0.118)	-0.171 (0.124)	0.018 (0.074)	-0.208 (0.162)
Heterogeneous treatment	0.004 (0.072)	-0.207* (0.119)	-0.336** (0.150)	-0.294* (0.163)	-0.088 (0.126)	-0.334* (0.191)
Priming treatment	0.097 (0.091)	0.099 (0.090)	-0.012 (0.136)	-0.183 (0.161)	-0.177 (0.161)	-0.194 (0.182)
Rank 1 in part 3	-0.199*** (0.076)	-0.194** (0.076)	-0.231*** (0.088)	-0.326*** (0.091)	-0.336*** (0.091)	-0.013 (0.090)
Rank 2 in part 3	-0.210*** (0.075)	-0.209*** (0.076)	-0.210** (0.085)	-0.297*** (0.087)	-0.301*** (0.087)	-
Male	-0.206* (0.116)	-0.238** (0.117)	-0.238** (0.117)	-0.209* (0.119)	-0.178 (0.118)	0.089 (0.113)
Male * Rank 1	0.079 (0.134)	0.094 (0.132)	0.101 (0.131)	0.094 (0.128)	0.081 (0.131)	-0.211 (0.161)
Male * Rank 2	0.173 (0.116)	0.197* (0.110)	0.202* (0.109)	0.206** (0.099)	0.186* (0.106)	-
Group feeling	-	0.042** (0.019)	0.044** (0.019)	0.038** (0.019)	-	0.045* (0.027)
Matched w/ two out-groups	-	-	0.105 (0.106)	0.130 (0.103)	0.123 (0.104)	0.203* (0.114)
Rank 1 w/ in-group Rank 3	-	-	0.239*** (0.089)	0.229** (0.086)	0.220** (0.089)	0.292*** (0.101)
Rank 2 w/ in-group Rank 3	-	-	0.115 (0.138)	0.056 (0.159)	0.050 (0.159)	0.062 (0.177)
Rank3 w/ one in-group	-	-	0.082 (0.136)	0.071 (0.134)	0.055 (0.137)	-
Belief: 1 other pays	-	-	-	-0.077 (0.068)	-0.082 (0.068)	-0.285*** (0.093)
Belief: 2 others pay	-	-	-	0.413*** (0.043)	0.416*** (0.043)	0.456*** (0.060)
N	360	360	360	360	360	240
Log-likelihood	-225.188	-225.188	-222.963	-190.272	-192.201	-124.347
LR Chi <sup>2</sup>	21.67	21.67	26.12	91.50	87.65	77.97
Prob>Chi <sup>2</sup>	0.010	0.010	0.016	0.000	0.000	0.000
Pseudo R <sup>2</sup>	0.046	0.046	0.055	0.194	0.186	0.239

Notes: The Table reports marginal effects. \*\*\* indicate significance at the 10% level, \*\* at the 5% level and \* at the 10% level.

Five findings are of note from Table 3. First, in all models, compared with the member who risks public exposure, the participants who get ranks 1 or 2 are

significantly less likely to choose to pay the fee.<sup>1</sup> This supports Conjecture 2. Second, the treatment manipulations have little effect on behavior. The Priming treatment does not reveal any differences relative to the Baseline. Thus, any difference observed in the Homogenous and Heterogeneous treatments is due to the group identity itself and not to the priming of collective feelings. Being in a triad with in-groups only (*i.e.*, in the Homogeneous treatment) does not increase the willingness to pay the fee as compared to the Baseline, controlling for the beliefs about others' willingness to pay the fee. Participating in the Heterogeneous treatment only makes a difference when one accounts for group identity feelings (but the significance level is marginal). When the group composition of the triad is heterogeneous, the individuals who feel a stronger group identity show more concern for face saving.

The third finding relates to the triad configuration in terms of group identity in the Heterogeneous treatment. In general, having the best or medium rank reduces the likelihood of paying the fee. Models (3) to (6) show that this negative effect is cancelled out when the best and the least performers hold the same group identity and the medium performer is an out-group. This partly supports Conjecture 4. This behavior is not observed for the medium performer when the member at risk is his only in-group member. A possible interpretation is that the pride conferred by getting the first rank conveys also a feeling of responsibility and solidarity towards a lower ranked group member. Another possible interpretation is that the negative externality

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<sup>1</sup> The marginal effects are similar for participants with rank 1 and those with rank 2 (Chi2 tests;  $p=0.882$  in model (1),  $p=0.843$  in model (2),  $p=0.785$  in model (3),  $p=0.728$  in model (4), and  $p=0.678$  in model (5)).

due to the exposure of an in-group is stronger for the individuals who get the best rank.

The fourth finding is that subjects are more likely to pay when they believe that the two other triad members make the same choice (models (5) and (6)). In contrast, the best and medium performers are less likely to pay the fee when they believe that one other member will pay (model (6)). This rejects an interpretation in terms of coordination which would require that one is more willing to pay when expecting that a single other member chooses to pay. Our finding suggests instead that participants choose to pay because preserving image is a social norm.<sup>1</sup> Finally, males at risk are less likely to choose to pay the fee than females who care more about their image. They are also less likely to pay to avoid others' exposure although the gender difference almost disappears when the subject has the medium performance rank.

We summarize our findings as follows:

**Result 1:** A large majority of individuals are willing to pay a price to avoid their own public exposure.

**Result 2:** Although they care more about preserving their own image, a majority of individuals are willing to incur a cost to waive the exposure of another member.

**Result 3:** While it influences the beliefs about others' willingness to help, group identity has relatively little impact on behavior, except that the best performers are more willing to pay to waive the exposure of an in-group than an out-group member.

### *Emotions*

The analysis of self-reported feelings supports our assumption that the ranking and public exposure of the least performers generate more unpleasant and less pleasurable

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<sup>1</sup> A regression on the sole triad members at risk of exposure (available upon request) shows that these subjects are more likely to pay the fee both when they believe that one or two other members choose to pay.

emotions. Figures 1 and 2 display the evolution of shame and happiness intensity over time, respectively, as reported by the participants depending on their rank in part 3 and on their actual public exposure. We consider the feelings reported at various points in time: at the beginning of the session, after receiving feedback on one's score in part 1, after receiving feedback on scores and ranks in part 2, after entering the decision to pay or not the fee in part 3, after the public exposure of the least performers, and after the feedback on score and rank in part 4.

These figures show no difference in shame and happiness between triad members at the beginning of the sessions or when receiving feedback on performance in part 1 (Mann-Whitney tests,  $p > 0.010$  in pairwise comparisons). The least performers start experiencing shame and a decrease in happiness when learning their rank in part 2 ( $p < 0.001$  when compared with subjects with rank 1 or 2), while the best performers' happiness is boosted by learning their rank ( $p < 0.001$  in each pairwise comparison). The least performers' emotions are exacerbated in part 3 when learning their risk of being exposed ( $p < 0.001$  when compared with subjects with rank 1 or 2).

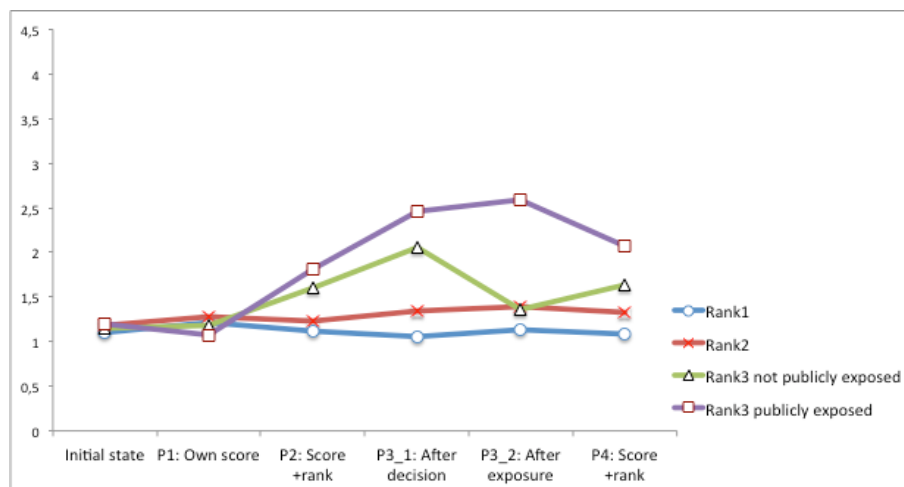


Figure 1. Shame intensity, by performance rank, in all treatments (N=360)



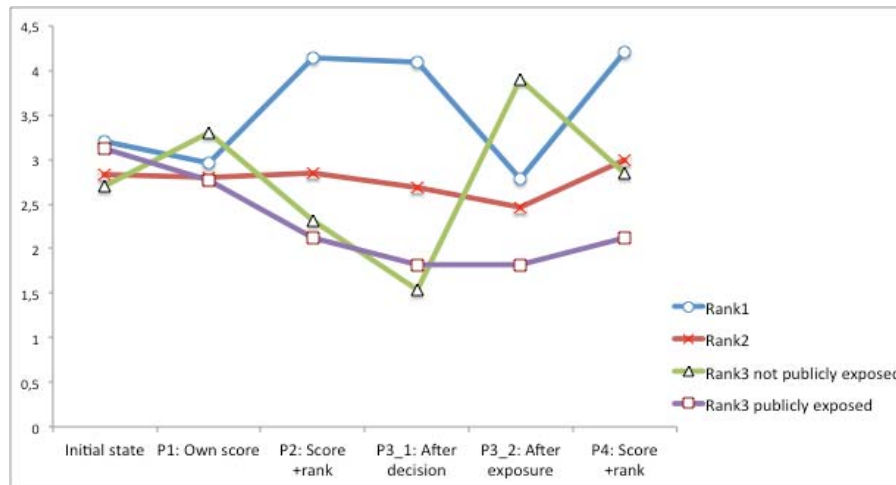


Figure 2. Happiness intensity, by performance rank, in all treatments (N=360)

The figures reveal three interesting findings about the emotions experienced after public exposure. First, the publicly exposed subjects report a level of shame similar to the level reported before knowing the decision of their triad members (Wilcoxon test,  $p=0.210$ ); this suggests that anticipatory feelings are as strong as those experienced at the time of exposure. Their level of shame decreases in part 4 (Wilcoxon test,  $p=0.018$ ) without returning to its initial level ( $p=0.001$ ), suggesting that it is durable. Second, the least performers who have not been exposed experience an immediate decrease of their shame intensity at the time of exposure (Wilcoxon test,  $p<0.001$ ) and their level of happiness peaks and exceeds that reported by the best performers (Mann-Whitney test,  $p<0.001$ ), probably capturing relief. In part 4 they still report a level of happiness that is higher than that of those who have been exposed ( $p=0.036$ ). Finally, the best performers express a sharp decrease in happiness when the least performers are publicly exposed compared to when they decide to pay the fee (Wilcoxon test,  $p<0.001$ ), which suggests empathy.

We summarize our analysis of emotions as follows:

**Result 4:** The public exposure of the least performers generates a feeling of shame and a decrease of happiness even in the individuals who are not directly concerned. This is likely a result of empathy.

#### *Evolution of performance levels*

To test Conjectures 3 and 5, Table 4 displays descriptive statistics on mean performance in each part for all participants and treatments, then for the Homogenous and Heterogeneous treatments, and finally, for the participants who got the lowest rank in their triad in part 3 and were or were not exposed. Table 4 attests of the presence of intrinsic and image motivation: although they are paid a fixed wage, all the participants provide a positive level of effort in all parts. Mean performance is higher in part 2 than in part 1 and higher in part 3 than in parts 1 and 2 (Wilcoxon tests,  $p < 0.001$ ). This may be explained by the pressure due to ranking and the risk of public exposure, as stated by Conjecture 3. This evolution is unlikely due to learning because of the low cognitive content of the task and of the practice period. Although there is no more risk of exposure, performance is higher in part 4 than in part 3 ( $p < 0.001$ ). Interestingly, this is not the case when we restrict the sample to the participants who have been exposed in part 3 ( $p = 0.349$ ).

Table 4. Performance of participants across parts

Participants	Part 1	Part 2	Part 3	Part 4	N
All participants	126.59 (14.57)	133.61 (14.57)	138.28 (15.08)	139.94 (16.28)	360
Homogenous treatment	126.61 (15.36)	135.28 (14.82)	140.10 (13.60)	140.70 (15.45)	126
Heterogeneous treatment	127.12 (13.13)	133.31 (14.38)	138.67 (15.50)	140.17 (17.06)	126
<i>Mann-Whitney tests</i>	<i>p=0.997</i>	<i>p=0.403</i>	<i>p=0.596</i>	<i>p=0.804</i>	
Rank 3 in part 3					
- Not exposed	113.89 (16.08)	122.36 (10.92)	125.32 (11.52)	129.70 (12.24)	81
- Exposed	120.64 (12.19)	122.46 (17.60)	125.95 (20.22)	126.97 (25.03)	39
<i>Mann-Whitney tests</i>	<i>p=0.052</i>	<i>p=0.209</i>	<i>p=0.052</i>	<i>p=0.510</i>	

Note: Standard deviations in parentheses.

Table 5. Determinants of the evolution of performance between part 3 and part 4, depending on rank in part 3

Dependent variable:	Rank 1 or 2 in part 3	Rank 3 in part 3
Variation of performance	(1)	(2)
Homogenous treatment	-1.171 (1.377)	-4.029** (1.871)
Heterogeneous treatment	-0.719 (1.368)	-2.424 (1.886)
Priming treatment	1.438 (1.993)	0.334 (2.606)
Paid the fee	-1.058 (1.180)	2.093 (1.775)
Exposure of rank 3 in part 3	-0.779 (1.241)	-3.129* (1.728)
Shame after exposure in part 3	-1.207** (0.541)	0.399 (0.473)
Constant	3.558** (1.608)	3.762 (2.426)
N	240	120
R <sup>2</sup>	0.039	0.124

Note: \*\* indicate significance at the 5% level and \* at the 10% level.

To explore further the determinants of the evolution of performance in reaction to the possible exposure of the least performers, Table 5 reports the estimates of OLS models in which the dependent variable is the difference in performance levels between part 4 and part 3. The independent variables include dummy variables for each treatment, the participant's gender and his reported shame intensity after the least performers' exposure. The "exposed" variable indicates whether the least performer in

the triad has been actually exposed. Model (1) is for participants who got the first or second rank in their triad in part 3 and model (2) for those who got the last rank. These regressions reveal a marginally significant crowding-out effect of exposure on future intrinsic motivation. Indeed, the performance of the exposed subjects decreases by 3.13 units between parts 3 and 4 compared to those who have avoided public exposure (model (2)). Moreover, a higher reported shame when others were publicly exposed decreases the intrinsic motivation of participants who were not personally at risk in part 3 (model (1)). Happiness has been shown to increase productivity at work (Oswald *et al.*, 2014); we show that negative emotions, like shame, tend to reduce productivity. These effects are small in magnitude (and in significance) but they tend to support Conjecture 3.

Finally, contrary to Conjecture 5, Table 4 indicates that mean performance is not higher in the Heterogeneous than in the Homogenous treatment (Mann-Whitney tests,  $p > 0.100$  in all parts). Being matched with one or two out-groups does not boost effort to increase the negative externalities of one's effort on out-groups. However, model (2) in Table 5 shows a negative effect of being in the Homogeneous treatment on the evolution of effort of the least performers between parts 3 and 4. Additional regressions (available upon request) show that this effect is entirely driven by the behavior of those who were not exposed thanks to their in-groups' help. An interpretation is that these subjects tend to reduce their effort in order to let their helping in-groups keep a high rank in the last part of the session. This leads to our final results.

**Result 5:** Ranking and public exposure support intrinsic and image motivation, while public exposure and shame tend to crowd-out the future intrinsic motivation.

**Result 6:** Group identity has little influence on performance and it only reduces the final performance of the individuals who avoided public exposure thanks to their in-groups' help.

## **2.6 DISCUSSION AND CONCLUSION**

The importance of preserving self and others' image in social interactions is well known from negotiations and diplomacy, but it has not been much documented by economists. In this paper, we designed a novel laboratory experiment both to explore the concern for self and others' image and its impact on productivity and to test whether this concern is affected by group identity. The results show that most subjects are willing to give up some money to avoid the public display of a poor relative performance. We interpret this behavior as evidence of the fear of losing face since individuals report shame and a lower level of happiness as soon as they learn their lower rank. However, the underlying mechanism linking emotions to behavior is still vague. A possible explanation is that anticipatory negative emotions inflict a moral cost to individuals. The monetary cost incurred to avoid exposure may be lower than the moral cost of exposure. An alternative explanation is that the emotions experienced by the individuals provoke the deviation from rational behavior. This research question clearly deserves further exploration.

A second major finding is that a majority of individuals sacrifice some of their own monetary income to save others' face, although there is no perspective of future personal benefit from this action. This empathic behavior demonstrates that

other-regarding preferences do not only apply to monetary payoffs but also to image. People appreciate being shown respect, especially when it is costly for the individual who pays respect (Ellingsen and Johannesson, 2008). Here, we show that individuals also like to do good to others in terms of image and status. In our experiment the cost incurred to avoid others' exposure represents 10% of the payoff. An interesting extension would be to vary this cost in order to measure the value of others' face.

Our manipulation of group identity influences individuals' expectations about others' choices but has little direct effect on behavior. The willingness to save others' face does not increase when we match individuals with in-groups. The main observed effect is that the best performers are more willing to save the face of an in-group than of an out-group when triads are mixed. The limited effect of group identity on face-saving behavior may be due to the fact that in-group favoritism in this type of situation would be perceived as violating a social norm (Harris *et al.*, 2012). It may result from inducing group identity with the minimal group paradigm or from conducting the study in China. Buchan *et al.* (2009) found that Chinese subjects sent and returned significantly more to out-groups than to in-groups in a trust game, while the opposite was found for American subjects. In collectivist cultures (Hofstede, 1980), the goals of the group matter more than those of individuals, which could lead collectively oriented subjects to pay less attention to social distance. Our results are consistent with this interpretation. This calls for cross-cultural replication studies to test whether *i*) face matters less in non-Confucian cultures, *ii*) individuals are less willing to sacrifice to save others' face, and *iii*) group identity has a stronger impact

on the decision to sacrifice for saving face in individualistic cultures.

Finally, the sensitiveness of effort to performance rankings and self-image confirms the value of intrinsic and image motivation. However, public exposure tends to crowd-out future intrinsic motivation because it violates a psychological contract and creates a hostile environment. Therefore, our study provides insights on one risk associated with the use of informational incentives. Providing feedback about relative performance may encourage people to work harder but when information is disseminated it can also generate negative emotions like shame and a decreased level of happiness whose longer-term effects on productivity are still to be explored.

## APPENDIX 1 – Instructions for the Baseline treatment (translated into Chinese)

We thank you for participating in this experiment in decision-making. It is forbidden to talk to the other participants throughout the session.

We will first ask you to describe the feelings you experience right now. Your screen will display a series of 10 statements. For each statement, we ask you to choose a number between 1 and 7 (included) to describe how you feel right now.

The choice of a higher number indicates that you experience this feeling with a higher intensity. For example, choosing number 1 indicates that you do not experience this feeling at all. At the opposite, choosing number 7 indicates that you experience this feeling with a very high intensity. Intermediate values are indicated by the choice of intermediate numbers.

Do not spend too much time on any one statement; simply choose the number which seems to describe your present feelings best.

The 10 proposed statements are the following:

- I feel angry
- I feel contempt
- I feel ashamed
- I feel envious
- I feel sad
- I feel happy
- I feel guilty
- I feel grateful
- I feel fearful
- I feel relieved

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### **Instructions (cont'd) (distributed after completion of the initial elicitation of feelings)**

The remaining of this session consists of several parts. You will receive the instructions for each part after completing the previous part.

During these parts, the amount of money you will earn may depend upon your actions and the actions of the other participants you will interact with. Throughout the session, your earnings will be given in ECU (Experimental Currency Units). At the end of the session, your total earnings in ECU will be the sum of your payoffs earned in each part. These earnings will be converted into RMB at the rate:

$$10 \text{ ECU} = 1 \text{ RMB}$$

Your earnings will be paid to you in cash and in private at the end of the session.

#### **Part 1**

At the beginning of this part and throughout the session, the participants are grouped into triads. **The composition of your triad will remain constant throughout the session.** You will not be informed on the identity of the two other members of your triad.

During this part, we ask you to perform a task on your computer during 4 minutes. This task consists of moving apples into a basket with your mouse.

Each apple moved into the basket will increase your score by one unit. Your current score (i.e. the current number of apples in the basket) as well as the remaining time will be displayed on your screen continuously.

Once the 4 minutes have elapsed, your screen will remind you your score in this part. You will not be informed of the scores of your two other triad members.

You will be paid 100 ECU in this part.



Before starting performing the task, you will be allowed to practice this task during 2 minutes. The performance in this practice period will not be taken into account in your score of this part.

At the end of this part, a questionnaire about your current feelings will be displayed on your computer screen. To fill out this questionnaire, the rules are the same as previously.

If you have any question regarding these instructions, please raise your hand. We will answer to your questions privately.

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### **Part 2** (*distributed after completion of the previous part*)

In this part, the composition of your triad is the same as in the previous part.

We ask you to perform the same task on your computer as previously during 4 minutes. You will be paid 100 ECU in this part.

The difference with the previous part is that once the 4 minutes have elapsed, your screen will display your score and your rank within the triad in this part.

The rank 1 will be assigned to the triad member who has performed the highest score.

The rank 3 will be assigned to the member who has performed the lowest score.

The rank 2 will be assigned to the member who has performed the intermediate score.

In case of ties between two or three triad members, the ranks will be assigned randomly between the ties.

You will be informed of the score and the rank of each of your two other triad members.

Last, a questionnaire about your current feelings will be displayed on your computer screen.

If you have any question regarding these instructions, please raise your hand. We will answer to your questions privately.

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### **Part 3** (*distributed after completion of the previous part*)

In this part, the composition of your triad is the same as in the previous parts. We ask you to perform the same task on your computer as previously during 4 minutes. You will be paid 100 ECU in this part. Once the 4 minutes have elapsed, your screen will display your score and your rank within the triad, as well as the score and the rank of each of the two other triad members.

A difference with the previous part lies in the fact that the participants who have got **rank 3 (the lowest score)** in each triad will be requested to stand up, to move forward to the front of the room, one by one, before being sent back to their seat.

However, you will be able to modify the regular process by your decisions. Indeed, after being informed on the assignment of ranks and before participants with **rank 3 (the lowest score)** are called to the front of the room, you will decide whether you let the regular process apply or whether you prefer that the member of your triad who has got rank 3 is not called to the front of the room.

- If you are willing that the regular process applies, press « VALIDATE ».

- If you are not willing that the member of your triad with rank 3 is called to the front of the room, press « NO STAND UP » and validate your decision.

If at least two members of the triad have pressed « NO STAND UP », the member of your triad who has got rank 3 will not be called and will not be identified in the room. In this case, the members who have chosen « NO STAND UP » will pay a cost of 10 ECU each that will be deducted from their payoff in this part.

In all the other cases, the regular process applies. The member of your triad with rank 3 will be called to the front of the room. Payoffs will not be modified.

You will be informed of the decision of each of your triad members, together with their score and their rank.

A questionnaire about your current feelings will be displayed on your computer screen both after you have made your decision and after the participants with rank 3 have come back to their seat.

If you have any question regarding these instructions, please raise your hand. We will answer to your questions privately.

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**Part 4** (*distributed after completion of the previous part*)

The rules that apply in this part are the same as in Part 2. We ask you to perform the same task as previously during 4 minutes. You will be paid 100 ECU in this part. Once the 4 minutes have elapsed, your screen will display your score and your rank within the triad in this part. You will be also informed of the score and the rank of each of the two other triad members. Then, a questionnaire about your current feelings will be displayed on your computer screen.

Finally, you will be requested to fill out a post-experimental questionnaire and you will be invited to proceed to the payment room.

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## APPENDIX 2 – Instructions for the Homogenous and Heterogeneous treatments (translated into Chinese)

We thank you for participating in this experiment in decision-making. It is forbidden to talk to the other participants throughout the session.

We will first ask you to describe the feelings you experience right now. Your screen will display a series of 10 statements. For each statement, we ask you to choose one number between 1 and 7 (included) to describe how you feel right now.

The choice of a higher number indicates that you experience this feeling with a higher intensity. For example, choosing number 1 indicates that you do not experience this feeling at all. At the opposite, choosing number 7 indicates that you experience this feeling with a very high intensity. Intermediate values are indicated by the choice of intermediate numbers.

Do not spend too much time on any one statement; simply choose the number which seems to describe your present feelings best.

The 10 proposed statements are the following:

- I feel angry
- I feel contempt
- I feel ashamed
- I feel envious
- I feel sad
- I feel happy
- I feel guilty
- I feel grateful
- I feel fearful
- I feel relieved

-----

### **Instructions (cont'd) (distributed after completion of the initial elicitation of feelings)**

The remaining of this session consists of several parts. You will receive the instructions for each part after completing the previous part.

During these parts, the amount of money you will earn may depend upon your actions and the actions of the other participants you will interact with. Throughout the session, your earnings will be given in ECU (*Experimental Currency Units*). At the end of the session, your total earnings in ECU will be the sum of your payoffs earned in each part. These earnings will be converted into RMB at the rate:

$$10 \text{ ECU} = 1 \text{ RMB}$$

Your earnings will be paid to you in cash and in private at the end of the session.

### **Preliminary part**

At the beginning of this part and for the remainder of the session, the participants will be classified into one of two groups of equal size. Each group is called after the name of an artist: **Klee** or **Kandinsky**. You will be randomly assigned to one of these two groups, either the Klee group, or the Kandinsky group. You will belong to the same group throughout the session.

After informing you about your group membership, your screen will display five pairs of paintings. In each pair, a painting has been made by Klee, the other one by Kandinsky. Your screen will indicate which artist has painted each painting. Each pair of paintings will be displayed during 20 seconds.

After observing these five pairs of paintings, your screen will successively display two more paintings and you will be asked to select the artist who you think made each painting, respectively (Klee or Kandinsky). Each correct answer will pay you 50 ECU.

You may get help from or help other members in your own group while answering the two questions successively. Indeed, before submitting each of your answers, you can use a group chat program during

3 minutes to get help from or offer help to other members in your own group.

Except for the following restrictions, you can type whatever you want in the lower box of the chat program:

- Please do not identify yourself or send any information that could be used to identify you (age, gender, school, ...),
- Please refrain from using obscene or offensive language.

To send a message to your group members, simply press the  button.

Your messages will be shared only with the members of your own group. You will not be able to see the messages exchanged among the other group. People in the other group will not see the messages from your own group either.

Once the communication time has elapsed, you will be requested to enter your answer about the artist you think has made the painting displayed on your screen (Klee or Kandinsky).

You will be informed at the end of the session whether your answers were correct or not.

Once you have submitted your two answers, a questionnaire on your current feelings will be displayed on your computer screen. To fill out this questionnaire, the rules are the same as previously.

Please read these instructions again. If you have any question on these instructions, please raise your hand. We will answer your questions privately.

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### **Part 1**

At the beginning of this part and throughout the session, the participants are grouped into triads. **The composition of your triad will remain constant throughout the session.** You will not be informed on the identity of the other members of your triad. In contrast, you will be informed of the group of each of the two other triad members (Klee or Kandinsky); similarly, your triad members will learn your group.

During this part, we ask you to perform a task on your computer during 4 minutes. This task consists of moving apples into a basket with your mouse.

Each apple moved into the basket will increase your score by one unit. Your current score (i.e. the current number of apples in the basket) as well as the remaining time will be displayed on your screen continuously.

Once the 4 minutes have elapsed, your screen will remind you your score in this part. You will not be informed of the scores of your two other triad members.

You will be paid 100 ECU in this part.

Before starting performing the task, you will be allowed to practice this task during 2 minutes. The performance in this practice period will not be taken into account in your score of this part.

At the end of this part, a questionnaire about your current feelings will be displayed on your computer screen.

If you have any question regarding these instructions, please raise your hand. We will answer to your questions privately.

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### **Part 2** (*distributed after completion of the previous part*)

In this part, the composition of your triad is the same as in the previous part. We ask you to perform the same task on your computer as previously during 4 minutes. You will be paid 100 ECU in this part.

The difference with the previous part is that once the 4 minutes have elapsed, your screen will display your score and your rank within the triad in this part.

The rank 1 will be assigned to the triad member who has performed the highest score.

The rank 3 will be assigned to the member who has performed the lowest score.

The rank 2 will be assigned to the member who has performed the intermediate score.

In case of ties between two or three triad members, the ranks will be assigned randomly between the ties.

You will be informed of the group (Klee or Kandinsky), the score and the rank of each of your two other triad members. Last, a questionnaire about your current feelings will be displayed on your computer screen.

If you have any question regarding these instructions, please raise your hand. We will answer to your questions privately.

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### **Part 3** (*distributed after completion of the previous part*)

In this part, the composition of your triad is the same as in the previous parts. We ask you to perform the same task on your computer as previously during 4 minutes. You will be paid 100 ECU in this part.

Once the 4 minutes have elapsed, your screen will display your score and your rank within the triad, as well as the group (Klee or Kandinsky), the score and the rank of each of the two other triad members.

A difference with the previous part lies in the fact that the participants who have got **rank 3 (the lowest score)** in each triad will be requested to stand up, to move forward to the front of the room, one by one, and then to give the name of their group (Klee or Kandinsky) aloud before being sent back to their seat.

However, you will be able to modify the regular process by your decisions. Indeed, after being informed on the assignment of ranks and before participants with **rank 3 (the lowest score)** are called to the front of the room, you will decide whether you let the regular process apply or whether you prefer that the member of your triad who has got rank 3 is not called to the front of the room.

- If you are willing that the regular process applies, press « VALIDATE ».
- If you are not willing that the member of your triad with rank 3 is called to the front of the room, press « NO STAND UP » and validate your decision.

If at least two members of the triad have pressed « NO STAND UP », the member of your triad who has got rank 3 will not be called and will not be identified in the room. In this case, the members who have chosen « NO STAND UP » will pay a cost of 10 ECU each that will be deducted from their payoff in this part.

In all the other cases, the regular process applies. The member of your triad with rank 3 will be called to the front of the room, will give the name of his group aloud and will come back to his seat. Payoffs will not be modified.

You will be informed of the decision of each of your triad members, together with their group, their score and their rank.

A questionnaire about your feelings will be displayed on your computer screen both after you have made your decision and after the participants with rank 3 have come back to their seat.

If you have any question regarding these instructions, please raise your hand. We will answer to your questions privately.

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### **Part 4** (*distributed after completion of the previous part*)

The rules that apply in this part are the same as in part 2. We ask you to perform the same task as previously during 4 minutes. You will be paid 100 ECU in this part.

Once the 4 minutes have elapsed, your screen will display your score and your rank within the triad in this part. You will be also informed of the group (Klee or Kandinsky), the score and the rank of each of the two other triad members. Then, a questionnaire about your current feelings will be displayed on your computer screen.

Finally, you will be requested to fill out a post-experimental questionnaire and you will be invited to proceed to the payment room.

# Essay 3

## Image Reciprocity: Evidence from Laboratory Experiment<sup>1</sup>

### 3.1 INTRODUCTION

Reciprocal behavior is a widespread and vital phenomenon in the real world. Many papers in economics have demonstrated that reciprocity contributes to explain deviations in behavior from equilibrium predicted by conventional theory. For example, reciprocity is argued to account for price deviations (Fehr *et al.*, 1998) and wage rigidities in the labor market - firms are willing to pay a non-market clearing wage to workers even in the presence of excess labor supply; in turn, workers reward higher wage with higher effort provisions (Kirchler *et al.*, 1996, Fehr *et al.*, 1998). Reciprocity is claimed to be the key vehicle to facilitate the enforcement of non-incentive compatible contracts (Fehr *et al.*, 1997) and to sustain social norms

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(Fehr *et al.*, 2002). Although reciprocity has received a lot of attention in recent decades, economists have chiefly focused on reciprocity in terms of pecuniary payoffs; non-pecuniary reciprocity like image reciprocity has so far received no attention.

Recent literature in economics emphasizes image motivation as one of underlying incentive of people's behavior. Image motivation means that individuals are not only concerned with the outcomes of their behavior but also care about how others perceive their behavior. Image motivation has been shown to facilitate coordination in public goods games (Filiz-Ozbay and Ozbay, 2010); to increase charitable donations (Alpizar, *et al.*, 2008, Ariely, *et al.*, 2009); to motivate the post of information on voluntary contribution website (Toubia and Stephen, 2013); to purchase goods signaling high social rank (Johansson-Stenman and Martinsson, 2006). The sources of image motivation can be traced to people deriving ego utility directly. People appreciate being paid respect (Ellingsen and Johannesson, 2007, Eriksson and Villeval, 2011) and dislike the public exposure of their negative image (Eriksson *et al.*, 2014). Nevertheless, a question still remains open. Do individuals demonstrate reciprocity in terms of image? Specifically, if people have the option of preserving somebody's image at a personal cost and they choose to do it, do they reward such a kind behavior? On the opposite, if they don't do it, is there a risk that somebody will punish such an unkind behavior when the occasion permits it?

Like reciprocity in the pecuniary perspective, image reciprocity is an important phenomenon in social interactions, trade and labor relationships. Image reciprocity means that individuals seek to reward others' image kind behavior and punish others'

image unkind behavior. For example, in social interactions, people seek to preserve the self-esteem and prestige of others and expect those interacting with them to pay them the same respect. In commercial interactions, business partners try to maintain a mutual respect with each other. In contrast, in the labor relationships, if boss embarrasses his employee, the employee is likely to attenuate his effort in response, hence employment relationship might be terminated and cooperation would be unsuccessful. In some cultures like in eastern Asian countries, image reciprocity or face reciprocity (Ho, 1976) is very important and people are educated from a young age to pay respect to others' image and obey the norm of face reciprocity in social interactions (Hwang, 1987; Chang and Holt, 1994).

The contribution of this paper is two-fold; first, we aim at exploring the reciprocal behavior in image terms, specifically, do individuals reward other's image kind behaviors or punish others' image unkind ones. We also distinguish between direct reciprocity - individuals reward (punish) somebody who shows kind (unkind) behavior to them and indirect reciprocity - individuals reward (punish) somebody who shows kind (unkind) behavior to another person. Second, we investigate whether the availability of image reciprocity influences individuals' effort provision.

In the Baseline treatment of our lab experiment, participants have to exert a real effort in a group of three. We compare the performances of the triad members. The least performer within the triad must go to the front of the lab and be public exposed one by one. However participants can pay a fee to prevent such public exposure and save the least performer's image in their triad. In the Shaming - Praise treatment, triad



members are allowed to reward the best performer by choosing to pay to ask the best performer to go to the front of the lab and to be applauded by other participants to testify positive image reciprocity. In the Shaming - Praise Avoidance treatment, the setting is that triad members can punish the best performer through waiving their public praise to examine negative image reciprocity. In addition, in the Praise - Shaming treatment, the order of the public exposure of the least performer and the best performer is reversed to test whether it plays a role in image reciprocity. To provide a measure of emotions, self-reported surveys are conducted at the different stages of the experiment to collect data on a number of possible emotions.

We have four main findings: firstly, participants showed direct image reciprocity in the positive domain – the least performers were more willing to publicly praise the best performers given the best performers chose previously to waive the public exposure of the least performers. Similarly, the best performers were more likely to avoid the public exposure of least performers conditional on the least performers chose to publicly praise the best performers. However, participants are not found to punish others if triad members don't perform kindly in terms of image to them. Secondly, Participants demonstrated indirect image reciprocity behavior in the positive domain. They were also more likely to waive the public exposure of the least performers who showed kind behavior to another triad member. They were also more likely to publicly praise the best performers who demonstrated kind behavior to another triad member. Thirdly, the least performers publicly exposed reported the highest intensity of shame and the best performers publicly exposed reported a high

intensity of happiness, which validates that the public exposure procedure dramatically enhances participants' image. Finally, compared to the Baseline treatment, participants didn't decrease their efforts in treatments with the possibility of image reciprocity.

The remainder of the paper is organized as follows; the next section summarizes related literatures. The third section develops a theoretical model of image reciprocity. Relevant hypotheses are proposed in this section too. The fourth section describes the experimental design. Empirical results are presented in section five. Finally discussions are reported in the last section.

## **3.2 RELATED LITERATURE**

This paper covers two strands of literature on image and reciprocity. In recent decades, numerous researches have demonstrated the importance of image. Individuals derive utility from a positive self-image associated with morally commendable behavior (Johansson-Stenman and Svedsater, 2012). For example, Public-exposed profile leads volunteers to contribute more products feedbacks on online website (Wang, 2010). For the same reason, people are more likely to be volunteer firefighters (Carpenter and Myers, 2010) and act more pro-socially (James and Bernheim, 2009; Cueva and Dessi, 2012, Tonin and Vlassopoulos, 2013). One explanation is that visibility leads people's desire to not violate others' expectations (Dana *et al.*, 2006). Consequently public exposure could be an efficient device to incentivize individuals (Irlenbusch and Sliwka, 2005). By contract, Coricelli *et al.*, (2010, 2014) find non-monetary concern

deters tax evasion. The public exposure of people's negative image crowds out their future intrinsic incentive (Eriksson *et al.*, 2014). Punishment in public is found to promote norm obedience (Coricelli *et al.*, 2010, Xiao and Houser, 2011). Trustees behave strategically in a modified trust game when they learn whether his behavior is observable to the truster (Tadelis, 2008). In line with these empirical findings, Koszegi (2006), Benabou and Tirole (2006), Ariely *et al.*, (2009) incorporated image in theoretical models, in which individuals are not only concerned with their own payoff but also with how others perceive their behavior. However, previous researches mainly concern the influence of image. This paper extends his research by exploring whether or not people act reciprocally in terms of image and how image reciprocity consideration influences people's behavior in real-effort settings.

Reciprocity has been argued as an important element to solve coordination problem. The mutual cooperation between principals and agents in gift-exchange game can be enhanced when the agents' effort levels are observable to principal (Irlenbusch and Sliwka, 2005). Sales representatives distributing product samples as gifts to their business partners boost sales revenue substantially (Marechal and Thoni, 2007). People are more likely to transfer money to help those who help them as rewards (Blumenstock, 2011). For instance, reciprocity is considered as the key device to enhance individual's pro-social contribution. For example, in field settings, Falk (2007) and Alpizar *et al.*, (2008) find that a gift can promote volunteers' donation frequency and the amount of contribution. Below-market interest rate issued by banks leads borrowers to reduce the probability of default (Cornee and Szafarz,

2012). Reciprocity occurs even in one shot interact (Berg *et al.*, 1995) or via Internet (Charness *et al.*, 2007). It still plays a role when the stake payoff for participants is huge (Fehr *et al.*, 2002). Furthermore, interactions among people are found to facilitate the establishment of reciprocity relationship (Gächter and Falk, 2002; Sethi and Somanathan, 2003; Leider *et al.*, 2009). This paper contributes to the literature on whether people show reciprocity in the domain of image.

### 3.3 THEORETICAL MODEL AND PREDICTIONS

The theoretical model is inspired from the model of Benabou and Tirole (2006). The individual  $i$ 's motivations to perform a task is based on three incentives: intrinsic incentive ( $v_e$ ), extrinsic incentive ( $v_y$ ) and image motivation  $R_i(\cdot)$ . ( $v_e, v_y$ ) are assumed to be normally distributed. I extend individual's utility function to incorporate the utility deriving from others' negative image or positive image. Next the model is developed to include image reciprocity term. Specifically, the global utility of individual  $i$  is defined as:

$$U_i(e_i, s_i, s_i') = yv_y + e_iv_e - C_i(e_i) + R_i(\cdot) - K(s_i, E(\cdot)) \quad (1)$$

where  $e_i$  is the effort exerted by the individual  $i$ ,  $s_i$  refers to individual's decision regarding other triad members' public exposure and  $s_i'$  refers to individual's belief about the decisions of other triad members.  $C_i(e_i)$  the cost of exerting effort, which is assumed to be convex. The image utility function  $R_i(\cdot)$  enters negatively the individual's utility if the individual is publicly exposed in case he is the least

performer or entails a positive utility if individual is publicly exposed as the best performer. This term is equal to 0 if the individual has no image concern or the public exposure is waived. It is equal to the reputational loss (gain) for an image-concerned individual if he is publicly exposed as the least performer (the best performer).  $K(s_i, E(\cdot))$  refers to the fee to be paid to avoid the public exposure, which is charged when the individual choose to pay and the default public exposure procedure is modified. Individual  $i$  chooses his effort  $e_i$  in the task and decides whether to pay the fee to change the default public exposure procedure conditional on the belief about the decisions of other triad members to maximize their global utility. Specifically, the image utility function of individual  $i$  can be written under two conditions as follows:

If triad members are publicly exposed as the least performer:

$$R_i(\cdot) = \alpha_i E_i(s_i, s_{j,k}, s'_i | e_i < e_{j,k}, K) + \beta_i E_j(s_i, s_{j,k}, s'_i | e_j < e_{i,k}, K) \quad (2)$$

with  $\alpha_i \geq \beta_i \geq 0$

If triad members are publicly exposed as the best performer:

$$R_i(\cdot) = \alpha_i E_i(s_i, s_{j,k}, s'_i | e_i > e_{j,k}, K) + \beta_i E_j(s_i, s_{j,k}, s'_i | e_j > e_{i,k}, K) \quad (3)$$

with  $\alpha_i \geq \beta_i \geq 0$

The image utility function consists of two terms, the first terms in eq. (2) and eq. (3) represent individual  $i$ 's image utility deriving from their own public exposure; the second terms in eq. (2) and eq. (3) represent individual  $i$ 's image utility deriving from the public exposure of another triad member  $j$ .  $s_i$  refers to the individual  $i$ 's decision to pay the fee to modify self- or another triad member  $j$ 's default public exposure procedure.  $s'_i$  represents individual  $i$ 's belief about the number of other triad

members choosing to pay. Accordingly,  $s_{j,k}$  is defined as the decisions of another triad members  $j$  and  $k$ .  $K$  refers to the fee to be paid to avoid public exposure.

$E_i(.)$  and  $E_j(.)$  represent the expectation of the public exposure of the individual  $i$  and another triad member  $j$  respectively, which are functions of the decisions and beliefs of triad members conditional on their relative performances and the fee to pay. If triad members are publicly exposed as the least performer,  $E_i(.)$  and  $E_j(.)$  enter negatively to the image term of the individual  $i$ ; if triad members are publicly praised,  $E_i(.)$  and  $E_j(.)$  entail positive utility to the image function of the individual  $i$ .

Individual  $i$  has a different concern for self- and another triad member  $j$ 's image.  $\alpha_i$  represents individual  $i$ 's degree of concern for his own image, with  $\alpha_i=0$  if the individual  $i$  does not care about being exposed.  $\beta_i$  represents his degree of concern for another triad member  $j$ 's image, with  $\beta_i=0$  if  $i$  doesn't care about others' image. If the individual  $i$  is publicly exposed as the lowest performer ( $e_i < e_{j,k}$ ), he suffers a loss  $\alpha_i$  ( $\alpha_i > 0$ ). If another triad member  $j$  is publicly exposed as the least performer ( $e_j < e_{i,k}$ ), individual  $i$  suffers a loss  $\beta_i$ . The opposite holds if individual  $i$  or another triad member is publicly exposed as the best performer. We assume that individuals are more concerned by their own image than by others' image ( $\alpha_i > \beta_i$ ).

Based on the premise that individuals have a concern for both self- and others' image, reciprocity term  $q^j$  can be introduced into individual  $i$ 's utility function (Charness and Rabin, 2002). This captures the idea that people are more concerned with the image of the person who demonstrates a kind behavior to them before and vice versa.

If triad members are publicly exposed as the least performer:

$$R_i(.) = \alpha_i E_i(s_i, s_{j,k}, s_i' | e_i < e_{j,k}, K) + (\beta_i + \theta_i^j q^j) E_j(s_i, s_{j,k}, s_i' | e_j < e_{i,k}, K) \quad (5)$$

with  $\alpha_i \geq \beta_i \geq 0$

If triad members are publicly exposed as the best performer:

$$R_i(.) = \alpha_i E_i(s_i, s_{j,k}, s_i' | e_i > e_{j,k}, K) + (\beta_i + \theta_i^j q^j) E_j(s_i, s_{j,k}, s_i' | e_j > e_{i,k}, K) \quad (6)$$

with  $\alpha_i \geq \beta_i \geq 0$

$q^j$  indicates the behavior of individual  $j$  perceived by individual  $i$ , where  $q^j = 1$  if individual  $j$  acts as individual  $i$  expects and individual  $i$  considers the behavior of individual  $j$  as a kind behavior;  $q^j = -1$  if individual  $j$  doesn't act as individual  $i$  expects and individual  $i$  considers the behavior of individual  $j$  as unkind and  $q^j = 0$  otherwise.

Reciprocity is captured by assuming  $\theta_i^j > 0$ . Positive reciprocity occurs if individual  $j$  behaves kindly to individual  $i$ , individual  $i$ 's concern level for  $j$ 's image increases  $\theta_i^j$ . This reflects the change of individual  $i$ 's concern level due to the kind behavior of individual  $j$ . In contrast, negative reciprocity occurs if individual  $j$  behave unkindly, individual  $i$ 's concern for  $j$ 's image decreases  $\theta_i^j$ . This reflects the change of individual  $i$ 's concern because of individual  $j$ 's misbehavior.

Eq. (5) and (6) allow us to derive *Positive Image Reciprocity Hypothesis*. If somebody avoids the public exposure of individual  $i$ 's negative image or he promotes individual  $i$ 's positive image, individual  $i$  would consider it as a kind behavior and care more about somebody's image as reward. Consequently, individual  $i$  is more likely to avoid somebody's negative image or to promote somebody's positive image as reward.

*Positive Image Reciprocity Hypothesis*: Ceteris paribus, people are more willing to

avoid somebody's negative image or promote somebody's positive image conditional on somebody showing image kind behavior before.

By contrast, if somebody doesn't avoid the public exposure of individual  $i$ 's negative image or he doesn't promote individual  $i$ 's positive image; individual  $i$  would consider it as an unkind behavior and care less about somebody's image. Therefore individual  $i$  would be less likely to avoid the public exposure of somebody's negative image or more likely to avoid the public exposure of his positive image as revenge.

Hence I also propose *Negative Image Reciprocity Hypothesis* as follows:

*Negative Image Reciprocity Hypothesis:* Ceteris paribus, people are less willing to avoid the public exposure of somebody's negative image or more likely to prevent the public praise conditional on somebody performs unkindly before.

Based on eq. (2), (3), (5) and (6), the third hypothesis is proposed. The introduction of the possibility of image reciprocity leads to a higher willingness of other triad members to avoid the public exposure of the least performer. Image concerned individuals rationally expect the lower likelihood of being publicly exposed when they perform least and act strategically to exert less effort in the task.

*Effort Provision Hypothesis:* Image concerned people attenuate their effort provision in the task in the treatments with the possibility of image reciprocity because they rationally expect that other triad members are more likely to preserve their image when they perform least.

### **3.4 EXPERIMENTAL DESIGN**



### 3.4.1 Treatments

The experiment consists of four treatments, a Baseline treatment and three treatments to examine image reciprocity both in the positive domain and in the negative domain.

#### *Baseline treatment*

In the Baseline treatment, participants are randomly grouped as triads in the beginning of the session and member composition in each triad is kept constant throughout the session. Subsequently, participants complete the same task in four parts and a flat wage (100 ECU) is paid for each part<sup>1</sup>. Specifically, participants have to move an apple on the screen into a basket and each apple moved into the basket earns one point for them<sup>2</sup>. Their own scores are displayed continuously on the bottom of the screen. The task lasts for 4 minutes in each part and a practice part is run for 2 minutes before the actual parts.

The feedbacks are varied across parts. At the end of part 1, participants only learn their own score. At the end of part 2, participants are not only informed on their own score, but they are also informed about the score and the relative rank of each triad member (including themselves). The best performer of the triad is assigned rank 1, the medium performer of the triad is assigned rank 2 and the least performer of the triad is assigned rank 3<sup>3</sup>. At the end of part 3, in addition to the feedback on the score and the relative rank of each triad member, participants who got rank 3 are requested

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<sup>1</sup> The introduction of flat wage excludes the extrinsic incentive in the task.

<sup>2</sup> After participants move an apple to the basket, another apple will reappear on the screen at a random spot until the end of the part. This real effort game is highly related with participants' effort instead of their ability.

<sup>3</sup> If two or three triad members attain the same score in that part, their relative ranks would be determined randomly.

to stand up and go to the front of the laboratory one by one before moving back to their seat. Hence the least performers are publicly exposed and identified by all participants, which leads to a loss in terms of image for the least performers. Public exposure entails no monetary loss. Triad members (including the least performer), however, can choose to pay to avoid the public exposure of the least performer in their triad. If at least two triad members (including the least performer) choose to pay, the public exposure of the least performer is waived and 10 ECU are deducted from the payoff of the triad members who choose to pay. In any other situation, the least performer is publicly exposed and no deduction is made from the payoff of those who choose to pay. The feedback of part 4 is the same as part 2; participants only learn the score and rank of each triad member.

At the end of each session, a questionnaire is conducted to gather related demographical information of participants. In addition, self-reported emotion surveys (Hopfensitz and Reuben, 2009) are introduced at each step of the game to collect the intensity of ten emotions (anger, contempt, shame, envy, sadness, happiness, guilty, gratefulness, fear and relief).

#### *Shaming – Praise treatment*

The difference with the Baseline treatment is that there might be a public praise stage in part 3 for the best performers. After the public exposure of the least performers in part 3, triad members (including the best performer) can pay to publicly praise the best performer in their triad. Given at least two triad members choose to pay, the best performers have to stand up, go to the front of the laboratory to be applauded from all

other participants before they move back to their seat. Similarly, 10 ECU are deducted from the payoff of participants who choose to pay. In any other case, the best performer should only remain at their seat. Prior to triad members make decisions, they are informed the decisions of triad members about the public exposure of the least performers. The option to publicly praise the best performer allows the least performer to reward the kind behavior of the best performer in the previous stage of part 3, which captures positive image reciprocity. Furthermore, the higher willingness of the medium performer to publicly praise the best performer due to their kind behavior to the least performer in the previous stage suggests the existence of indirect positive image reciprocity.

*Shaming –Praise Avoidance treatment*

This treatment is similar as the Shaming - Praise treatment except that the default setting in the last stage of part 3 is that the best performers have to stand up, go to the front of the laboratory and accept applauds from all other participants. However, the public praise of the best performer can be waived if any triad member (including the best performer) chooses to pay to prevent it. In this case, the best performer remains at his seat. Prior to participants making the decision whether to prevent the public praise of the best performer, a feedback is given on the decision about the public exposure of the least performer made by each triad member. If the best performer did not choose to pay to avoid the public exposure of the least performer in the previous stage, the least performer may decide to pay to prevent their public praise of the best performer, which captures negative image reciprocity. Similarly, the attitude of the

medium performer to the best performer conditional on the best performer's decision allows us to observe indirect negative image reciprocity among triad members.

#### *Praise – Shaming treatment*

To explore the potential influence of the order of the public exposure of the least performer and the best performer, the Praise - Shaming treatment is implemented. This treatment replicates the similar design as the Shaming - Praise treatment but reverse the order of the public exposure procedure for the least performers and for the best performers. In part 3 of this treatment, triad members firstly choose whether or not to pay to prevent the public praise of the best performer in their triad. After they are informed the decision of each triad member and the best performer is publicly exposed. Triad members have to make the decision whether or not to pay to avoid the public exposure of the least performer in their triad. In addition to explore the influence of the order of the public exposure on the occurrence of image reciprocity, this treatment also allows us to observe positive reciprocity and indirect positive reciprocity. In addition, the introduction of the last three treatments allows us to examine the influence of the availability of image reciprocity on individuals' effort provisions. The same self-reported emotion surveys are conducted at each step of the game in these three treatments as well to collect the emotion intensity of participants.

#### *Belief Elicitation*

Participants might estimate others' willingness to pay before they make their decisions. Questions about the estimated number of the other two triad members choosing to pay (0, 1 or 2) are asked after participants make each decision regarding

the public exposure of triad members. Each correct prediction earns an additional 50 ECU to the payoff of participants. To control for the possible hedging effect of introducing monetary incentivized belief questions, belief questions are not mentioned in the instruction.

#### *3.4.2 Procedures*

The experiment was run at the laboratory of Beijing Normal University, Beijing, China in March of 2013. In total, 144 undergraduate and graduate students were recruited from online campus forums from various disciplines of Beijing Normal University and Beijing University of Posts and Telecommunications. The experiment has 8 sessions in 4 treatments, 2 sessions for each treatment. Table 1 summarizes the basic information of the experiment.

The mean age of the participants is 22.25 years old and female proportion is 77.08%. The experiment used a between-subject design and the experimental protocol was programmed using REGATE soft package. The average experimental duration including payment was one and a half hours. The average payoff for each participant was 45 Yuan (5.6 Euro), which equal to the wage of the part-time job in Beijing, and was paid to them in privacy.

Table 1. Summary of sessions

Session number	Treatments	Number of participants	Mean age	Female ratio (%)
1	Baseline treatment	18	22.00	94.44
2	Baseline treatment	18	22.78	72.22
3	Shaming – Praise Avoidance treatment	18	22.28	55.56
4	Shaming – Praise Avoidance treatment	18	22.83	55.56
5	Shaming – Praise treatment	18	22.39	83.33
6	Shaming – Praise treatment	18	22.17	88.89
7	Praise – Shaming treatment	18	21.67	83.33
8	Praise – Shaming treatment	18	21.89	83.33

### 3.5 RESULTS

Next, I firstly study whether participants reciprocate those showing kind/unkind behavior. Second, I investigate whether participants reward/punish those demonstrating kind/unkind behavior to another triad members. Subsequently, I explore the underlying psychological sources of participants during the game. Finally I examine the influence of the availability of image reciprocity on individuals' effort provisions.

**Result 1:** *Participants demonstrated positive image reciprocity. Participants who got rank 3 were more willing to publicly praise participants who got rank 1 if participants who got rank 1 chose to avoid their public exposure. Participants who got rank 1 were more likely to avoid the public exposure of participants who got rank 3 if participants who got rank 3 chose to publicly praise them. However, reciprocity wasn't found to occur in the negative domain.*

The first module of table 2 shows in part 3 of the Shaming - Praise treatment, the

number of participants who got rank 3 choosing to reward participants who got rank 1 conditional on the decisions made by participants who got rank 1 in the previous stage. The behavior that participants chose to avoid the public exposure of participants who got rank 3 or chose to publicly praise participants who got rank 1 in the previous stage of part 3 is defined as a *kind* behavior, otherwise, it is considered as an *unkind* behavior. The behavior that participants chose to publicly praise participants who got rank 1 or chose to avoid the public exposure of participants who got rank 3 in the last stage of part 3 is considered as *rewarding kind*, otherwise it is *rewarding unkind*.

Data shows the difference is significant. If participants who got rank 1 chose to pay to avoid the public exposure of participants who got rank 3 in the previous stage, 4 out of 5 of participants who got rank 3 chose to reward participants who got rank 1 by paying to publicly praise participants who got rank 1 in the last stage. In contrast, if participants who got rank 1 didn't choose to pay to avoid the public exposure of participants who got rank 3 in the previous stage, none of participants who got rank 3 chose to pay to praise participants who got rank 1 in the last stage. Two-group proportion test indicates that the decisions made by participants who got rank 3 are significantly different at 1% significance level ( $P=0.004$ ) conditional on whether or not participants who got rank 1 choosing to avoid the public exposure of participants who got rank 3 in the previous stage.

Table 2. The number of R3/R1 rewarding kind (or unkind) based on R1/R3's decision.

Shaming - Praise Treatment		
	If R1 show kind	If R1 show unkind
The number of R3 rewarding kind	4/5	0/7
The number of R3 rewarding unkind	1/5	7/7
Praise - Shaming Treatment		
	If R3 show kind	If R3 show unkind
The number of R1 rewarding kind	2/2	2/10
The number of R1 rewarding unkind	0/2	8/10
Shaming - Praise Avoidance Treatment		
	If R1 show kind	If R1 show unkind
The number of R3 not rewarding unkind	9/9	15/15
The number of R3 rewarding unkind	0/9	0/15

The second module of table 2 summarizes in part 3 of the Praise - Shaming treatment, the proportion of participants who got rank 1 choosing to reward participants who got rank 3 based on the decisions of participants who got rank 3 in the previous stage. Similarly participants who got rank 1 performed differently after they learned the decisions made by participants who got rank 3 in the previous stage. If participants who got rank 3 chose to pay to publicly praise participants who got rank 1, all of participants who got rank 1 (2 out of 2) chose to pay to avoid the public exposure of participants who got rank 3. If participants who got rank 3 didn't chose to pay to publicly praise participants who got rank 1, only 2 out of 10 of participants who got rank 1 chose to pay to avoid the public exposure of participants who got rank 3. Two-group proportion test reveals the decisions made by participants who got rank 1 regarding the public exposure of participants who got rank 3 are significantly different at the 5% significance level ( $P=0.029$ ) conditional on participants who got rank 3 acting kindly in the previous stage. All in all, the first two modules of table support *Positive Image Reciprocity Hypothesis* that whether or not people



demonstrating image kind behavior to somebody is conditional on somebody's image kind behavior before.

The third module of table 2 presents, the proportion of participants who got rank 3 punishing participants who got rank 1 conditional on participants who got rank 1's decisions in the part 3 of the Shaming - Praise Avoidance treatment. Data shows that no matter participants who got rank 1 chose or not to avoid the public exposure of participants who got rank 3 in the previous stage; none of participants who got rank 3 chose to prevent the public praise of participants who got rank 1 as revenge. This result rejects *Negative Image Reciprocity Hypothesis*, which suggests people are not willing to spoil others' image even when they were not treated kindly.

**Result 2:** *Participants showed indirect image reciprocity in the positive domain. Participants who got rank 2 were more willing to publicly praise participants who got rank 1 who chose to avoid the public exposure of participants who got rank 3. Similarly, participants who got rank 2 were more willing to avoid the public exposure of participants who got rank 3 who chose to publicly praise participants who got rank 1. However, indirect reciprocity was not found in the negative domain too.*

The first module of table 3 describes in part 3 of the Shaming - Praise treatment, the number of participants who got rank 2 rewarding participants who got rank 1 conditional on the decisions made by participants who got rank 1 in the previous stage. Although participants who got rank 1 didn't show kind behavior directly to participants who got rank 2, 3 out of 5 of participants who got rank 2 chose to pay to publicly praise participants who got rank 1 in reward of their kind behavior to

participants who got rank 3 in the previous stage. On the contrary, if participants who got rank 1 didn't choose to pay to avoid the public exposure of participants who got rank 3, only 1 out of 7 of participants who got rank 2 chose to pay to publicly praise participants who got rank 1. This difference is validated significantly in two-group proportion test ( $P=0.098$ ).

The second module of table 3 shows the similar pattern in the Praise - Shaming treatment. If participants who got rank 3 chose to publicly praise participants who got rank 1, all participants who got rank 2 (2 out of 2) chose to pay to avoid participants who got rank 3's public exposure. If participants who got rank 3 didn't choose to publicly praise participants who got rank 1, only 3 out of 10 of participants who got rank 2 chose to avoid participants who got rank 3's public exposure. Two-group proportion test also reveals the decisions made by participants who got rank 2 are significantly different ( $P = 0.067$ ) conditional on whether or not participants who got rank 3 publicly praising participants who got rank 1.

Table 3. The number of R2 rewarding kind (or unkind) based on R1/R3's decision.

Shaming - Praise Treatment		
	If R1 show kind	If R1 show unkind
The number of R2 rewarding kind	3/5	1/7
The number of R2 not rewarding unkind	2/5	6/7
Praise - Shaming Treatment		
	If R3 show kind	If R3 show unkind
The number of R2 rewarding kind	2/2	3/10
The number of R2 rewarding unkind	0/2	7/10
Shaming - Praise Avoidance Treatment		
	If R1 show kind	If R1 not show kind
The number of R2 not rewarding unkind	4/4	8/8
The number of R2 rewarding unkind	0/4	0/8

The third module of table 3 reports the decisions of participants who got rank 2

punish participants who got rank 1 conditional on the decisions of participants who got rank 1 in the Shaming - Praise Avoidance treatment. In spite of participants who got rank 1 choosing or not to preserve the image of participants who got rank 3; none of participants who got rank 2 chose to punish participants who got rank 1 by preventing their public praise. Indirect image reciprocity did not occur in the negative domain too.

The phenomenon of indirect reciprocity, in which people reward someone who displays kind behavior to a third party, has been documented in current literature (Dufwenberg *et al.*, 2001; Engelmann and Fischbacher, 2009; Gächter and Herrmann, 2009; Liang and Meng, 2013). Data from this experiment complement previous findings by showing that indirect positive reciprocity occurs not only in the pecuniary sphere but also in the domain of image.

To draw more robust conclusions about positive image reciprocity, Probit regressions on data from the Shaming - Praise treatment and the Praise - Shaming treatment are run and table 4 reports these results. The dependent variable *reward* is defined as 1 if in the last stage of part 3, the least performers or the medium performers chose to publicly praise the best performers in the Shaming – Praise treatment or if the best performers or the medium performers chose to avoid the public exposure of the least performers in the Praise – Shaming treatment. The independent variable *kind* is equal to 1 if in the previous stage of part 3, the best performers or the medium performers chose to avoid the public exposure of the least performers in the Shaming – Praise treatment or if the least performers or the medium

performers chose to publicly praise the best performers in the Praise – Shaming treatment.

Table 4. Probit regression for the reciprocal behavior

Dependent Variable:	(1)	(2)
Reward =1 if choose to reciprocate, otherwise =0		
Kind	1.643 (0.000)***	1.772 (0.001)***
Male	0.737 (0.224)	0.604 (0.329)
Age	-0.049 (0.729)	-0.081 (0.582)
Rank 2 in part 3	0.173 (0.695)	0.154 (0.746)
Belief: 1 other pays	-	-0.744 (0.200)
Belief: 2 others pay		0.130 (0.838)
N	48	48
Log-likelihood	-22.270	-20.640
LR Chi2	17.86	21.12
Prob > chi2	0.001	0.002
Pseudo R2	0.286	0.338

Notes: \*\*\* significant at 1% level, \*\* significant at 5% level, \* significant at 10% level.

Column (1) in table 4 shows regression including control variables like gender, age and “rank 2 in part 3”. The variable “rank 2 in part 3” refers to participants who got medium rank in part 3. Participants who got best performance in the Shaming – Praise treatment and participants who got least performance in the Praise – Shaming treatment serve as the reference category in the regression. Results show that the variable *kind* is significant at the 1% significance level after controlling for other variables. This indicates that the kind behaviors of triad members in the previous stage of part 3 leads to a higher likelihood of reward from other triad members in the

last stage.

Regression (2) augments regression (1) with participants' belief regarding the number of other triad members choosing to pay (0, 1 or 2). The variable *kind* is still significant at 1% significant level. The belief regarding the number of other triad members choosing to pay does not influence participants' decisions.

***Result 3: Emotional data shows the different sources of participants demonstrating aversion to public exposure. The least performers reported the highest level of shame intensity after being public exposed; while the best performers reported a higher level of happiness intensity after being publicly exposed.***

Investigating how participants think of the public exposure of their own image is important to understand the underlying source of image reciprocity behavior. The first module of table 5 describes the proportion of the least performers to avoid their public exposure across treatments. Obviously, in all treatments, a majority of the least performers chose to sacrifice part of their monetary payoff to avoid their public exposure. The proportion of the least performers chose to pay to avoid their public exposure is 66.67% in the Baseline treatment and 41.67% in the Shaming - Praise Avoidance treatment. In the Shaming - Praise treatment and in the Praise - Shaming treatment, the proportion of the least performers choosing to pay to avoid their public exposure is 75% and 83.33% respectively.

In addition, a significant proportion of the best performers tried to remain the status of not being publicly exposed in front of others. The second module of table 5 shows none of best performers chose to being publicly praised in the Shaming - Praise

treatment and in the Praise - Shaming treatment at the cost of their monetary payoff. For instance, in the Shaming - Praise Avoidance treatment, 33.33 % of the best performers even chose to pay to prevent being publicly praised.

Table 5. Percentages of the least performers/the best performers choosing the status of not being publicly exposed.

The least performers			
Baseline Treatment	Shaming - Praise Avoidance Treatment	Shaming - Praise Treatment	Praise - Shaming Treatment
66.67% (8/12)	41.67% (5/12)	75.00% (9/12)	83.33% (10/12)
The best performers			
Baseline Treatment	Shaming - Praise Avoidance Treatment	Shaming - Praise Treatment	Praise - Shaming Treatment
-	33.33% (4/12)	100% (12/12)	100% (12/12)

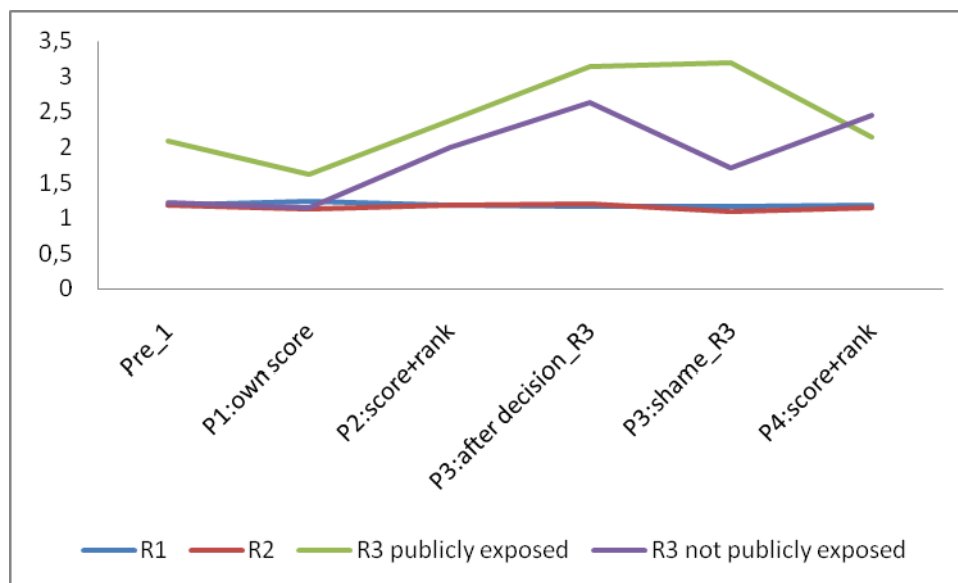


Figure 1. Shame intensity by rank in part 3, in all treatments

Because both the least performers and the best performers chose to avoid being publicly exposed, exploring the underlying emotions can allow us to distinguish participants who tried to avoid the specific emotions related with their public exposure or only to prevent the public exposure procedure. We report participants' emotion

evolutions from self-reported surveys in figure 1 and figure 2 respectively. Figure 1 presents shame intensity reported by participants by their rank in part 3 in all treatments. Shame intensity reported by the best performers and the medium performers remain at the low level and keep stable across the whole game. The shame intensity reported by the least performers increase sharply after they learned their relative rank within triad at the end of part 2 (Mann-Whitney Tests,  $P=0.001$ ), which suggests the displaying of relative rank matters for emotion change. The shame intensity reported by the least performers being publicly exposed keeps the similar trend as that reported by the least performers not being publicly exposed until the procedure of public exposure ( $P=0.389$ ). After the procedure of public exposure, the least performers being publicly exposed reported the highest shame intensity while the shame intensity reported by the least performers not being publicly exposed decreased sharply ( $P=0.003$ ). This figure indicates that public exposure significantly enhanced shame intensity of the least performers and the aversion to shame emotion can explain the least performers' behavior to avoid being publicly exposed.

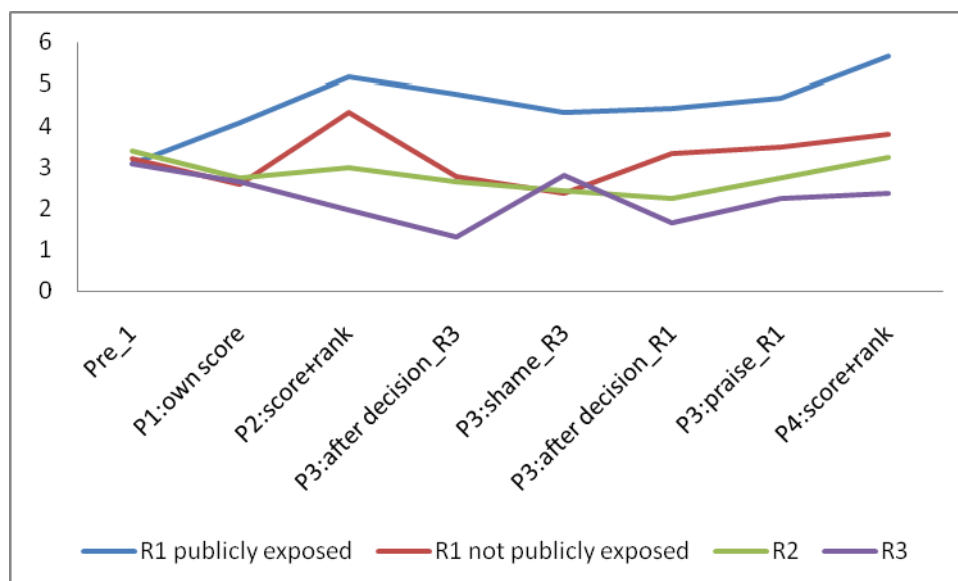


Figure 2. Happiness intensity by rank in part 3, in all treatments

Figure 2 depicts happiness intensity reported by participants in the game by their rank in part 3 in all treatments. In the beginning of the game, all participants reported similar happiness intensity (Mann-Whitney Tests,  $P=0.881$ ). The best performers being publicly exposed reported a higher happiness intensity and the trend was especially salient after the best performers being publicly exposed in front of other participants ( $P=0.001$ ). Figure 2 shows that the public exposure of the best performers dramatically enhances their happiness intensity, which demonstrates the best performers derived strong happiness from the public exposure procedure. The best performers derived a high happiness from the public exposure of their positive image but they still chose to pay to prevent their public exposure, a possible explanation to this phenomenon is traditional Chinese culture emphasizes people should keep a low-profile even when they achieve a success. Although people appreciate the public exposure of their positive image, they still choose to conceal their achievements.

Analysis on emotional data also provides direct evidences of the source of image reciprocity. People derive shame from the public exposure of their negative image; hence they reward the person who tries to avoid the public exposure of their negative image. In contrast, people derive happiness from the public exposure of their positive image. This incentivizes them to reward the person who chooses to publicly expose their positive image.

**Result 4:** Compared with the Baseline treatment, participants did not attenuate their effort in treatments with the possibility of image reciprocity.



Table 6. Performance of participants across parts by rank and by treatment

	Part 1	Part 2	Part 3	Part 4
All Participants				
Baseline treatment	125.47 (12.81)	132.58 (13.65)	135.14 (14.10)	139.19 (11.92)
Treatments with image reciprocity	128.35 (13.47)	135.31 (14.10)	139.10 (14.97)	141.10 (14.65)
Mann-Whitney tests	P=0.352	P=0.185	P=0.117	P=0.332
Rank 1 in part 2				
Baseline treatment	134.67 (9.18)	143.58 (11.44)	146.92 (10.83)	148.75 (11.14)
Treatments with image reciprocity	139.08 (10.99)	147.69 (9.83)	150.11 (11.49)	150.61 (13.81)
Mann-Whitney tests	P=0.174	P=0.198	P=0.238	P=0.567
Rank 2 in part 2				
Baseline treatment	127.25 (8.81)	133.75 (10.60)	137.83 (7.99)	139.67 (7.40)
Treatments with image reciprocity	128.81 (8.08)	134.89 (7.80)	140.81 (9.57)	142.47 (9.04)
Mann-Whitney tests	P=0.659	P=0.504	P=0.446	P=0.248
Rank 3 in part 2				
Baseline treatment	114.50 (11.53)	120.42 (7.40)	120.67 (7.99)	129.17 (7.96)
Treatments with image reciprocity	117.17 (11.03)	123.33 (12.03)	126.39 (12.94)	130.22 (12.91)
Mann-Whitney tests	P=0.634	P=0.512	P=0.078*	P=0.793

Note: standard deviations in parentheses.

Table 6 depicts participants' effort provisions across parts by their rank in part 2 and by treatment. Mann-Whitney tests are adopted to compare participants' effort provisions between the Baseline treatment and the treatments with the possibility of image reciprocity. Conventional theory predicts that the availability of image reciprocity results in participants attenuating their effort because they rationally expect that others are more likely to avoid their public exposure when they perform poorly. Tests show, however, participants exert similar efforts in three treatments with

the possibility of image reciprocity as in the Baseline treatment. For participants who got rank 3 in part 2, they exert even more effort in part 3 in the treatments with the possibility of image reciprocity. Participants did not try to exploit the potential interests through reducing their efforts in three treatments with the possibility of image reciprocity, which does not support the *Effort Provision Hypothesis*.

### **3.6 DISCUSSION AND CONCLUSION**

This paper provides the first empirical evidence that people are willing to reward others' kind behavior in terms of image protection. In addition, the indirect image reciprocity behavior among people was observed - although people did not accept the image kind behavior directly, they were still more likely to reciprocate somebody who demonstrated image kind behavior to a third party. Public exposure substantially strengthens the positive image of the best performer and deteriorates the negative image of the least performer. We attribute its influence to the underlying emotion fluctuation. Self-reported emotional surveys confirm the least performer being publicly exposed reported the highest level of shame, while the best performer being public exposed experienced a higher level of happiness. Consequently, people's decisions to avoid the public exposure of others' negative image or to publicly praise others' positive image are considered as a kind behavior, which leads to others' positive reciprocal behavior.

The negative image reciprocity behavior was not observed. People were more likely to promote others' positive image or to avoid others' negative image instead of

sabotaging others' positive image. This suggests people are more willing to engage in the behavior which is considered as morally correct instead of conducting the behavior which is considered as morally wrong. Potentially higher moral cost in spoiling others' image could account for such a behavioral differential.

In addition, participants weren't found to attenuate their effort provisions to exploit the potential interests of image reciprocity in three treatments with the possibility of image reciprocity. The possible explanation might be the occurrence of image reciprocity relies on the utmost effort provisions of the least performers signaling they are not lazy; therefore they still put in their maximum efforts.

This paper incorporates image reciprocity into the analysis of human social behavior. The reciprocal behavior in terms of image among people reflects the complex aspect of human society. The occurrence of image reciprocity relies on people's intention. This is consistent with the research findings showing that people not only care about the outcome of others' decisions but also about others' intentions (Rabin, 1993, Dufwenberg and Kichsteiger, 2004, Falk and Fischbacher, 2006). This paper investigates image reciprocity behavior in one-shot and perfect information settings. Image reciprocity involved in dynamic interactions and imperfect information setting would be a natural extension of this study.

## APPENDIX 1 – Instructions for the Shaming - Praise Treatment (translated into Chinese)

We thank you for participating in this experiment in decision-making. It is forbidden to talk to the other participants throughout the session.

We will first ask you to describe the feelings you experience right now. Your screen will display a series of 10 statements. For each statement, we ask you to choose a number between 1 and 7 (included) to describe how you feel right now.

The choice of a higher number indicates that you experience this feeling with a higher intensity. For example, choosing number 1 indicates that you do not experience this feeling at all. At the opposite, choosing number 7 indicates that you experience this feeling with a very high intensity. Intermediate values are indicated by the choice of intermediate numbers.

Do not spend too much time on any one statement; simply choose the number which seems to describe your present feelings best.

The 10 proposed statements are the following:

- I feel angry
- I feel contempt
- I feel ashamed
- I feel envious
- I feel sad
- I feel happy
- I feel guilty
- I feel grateful
- I feel fearful
- I feel relieved

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### **Instructions (cont'd) (distributed after completion of the initial elicitation of feelings)**

The remaining of this session consists of several parts. You will receive the instructions for each part after completing the previous part.

During these parts, the amount of money you will earn may depend upon your actions and the actions of the other participants you will interact with. Throughout the session, your earnings will be given in ECU (Experimental Currency Units). At the end of the session, your total earnings in ECU will be the sum of your payoffs earned in each part. These earnings will be converted into RMB at the rate:

$$10 \text{ ECU} = 1 \text{ RMB}$$

Your earnings will be paid to you in cash and in private at the end of the session.

#### **Part 1**

At the beginning of this part and throughout the session, the participants are grouped into triads. **The composition of your triad will remain constant throughout the session.** You will not be informed on the identity of the two other members of your triad.

During this part, we ask you to perform a task on your computer during 4 minutes. This task consists of moving apples into a basket with your mouse.

Each apple moved into the basket will increase your score by one unit. Your current score (i.e. the current number of apples in the basket) as well as the remaining time will be displayed on your screen continuously.

Once the 4 minutes have elapsed, your screen will remind you your score in this part. You will not be

informed of the scores of your two other triad members.

You will be paid 100 ECU in this part.

Before starting performing the task, you will be allowed to practice this task during 2 minutes. The performance in this practice period will not be taken into account in your score of this part.

At the end of this part, a questionnaire about your current feelings will be displayed on your computer screen. To fill out this questionnaire, the rules are the same as previously.

If you have any question regarding these instructions, please raise your hand. We will answer to your questions privately.

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### **Part 2** (*distributed after completion of the previous part*)

In this part, the composition of your triad is the same as in the previous part.

We ask you to perform the same task on your computer as previously during 4 minutes. You will be paid 100 ECU in this part.

The difference with the previous part is that once the 4 minutes have elapsed, your screen will display your score and your rank within the triad in this part.

The rank 1 will be assigned to the triad member who has performed the highest score.

The rank 3 will be assigned to the member who has performed the lowest score.

The rank 2 will be assigned to the member who has performed the intermediate score.

In case of ties between two or three triad members, the ranks will be assigned randomly between the ties.

You will be informed of the score and the rank of each of your two other triad members.

Last, a questionnaire about your current feelings will be displayed on your computer screen.

If you have any question regarding these instructions, please raise your hand. We will answer to your questions privately.

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### **Part 3** (*distributed after completion of the previous part*)

In this part, the composition of your triad is the same as in the previous parts. We ask you to perform the same task on your computer as previously during 4 minutes. You will be paid 100 ECU in this part. Once the 4 minutes have elapsed, your screen will display your score and your rank within the triad, as well as the score and the rank of each of the two other triad members.

A difference with the previous part lies in the fact that the participants who have got **rank 3 (the lowest score)** in each triad will be requested to stand up, to move forward to the front of the room, one by one, before being sent back to their seat.

However, you will be able to modify the regular process by your decisions. Indeed, after being informed on the assignment of ranks and before participants with **rank 3 (the lowest score)** are called to the front of the room, you will decide whether you let the regular process apply or whether you prefer that the member of your triad who has got rank 3 is not called to the front of the room.

- If you are willing that the regular process applies, press « VALIDATE ».

- If you are not willing that the member of your triad with rank 3 is called to the front of the room, press « NO STAND UP » and validate your decision.

If at least two members of the triad have pressed « NO STAND UP », the member of your triad who has got rank 3 will not be called and will not be identified in the room. In this case, the members who have chosen « NO STAND UP » will pay a cost of 10 ECU each that will be deducted from their payoff in this part.

In all the other cases, the regular process applies. The member of your triad with rank 3 will be called

to the front of the room. Payoffs will not be modified.

You will be informed of the decision of each of your triad members, together with their score and their rank.

A questionnaire about your current feelings will be displayed on your computer screen both after you have made your decision and after the participants with rank 3 have come back to their seat.

Then, you will decide whether you let the process apply or whether you prefer that the member of triad who has got **rank 1 (the highest score)** is called to the front of the room to be applauded by all the participants.

- If you are willing that the regular process applies (rank 1 does not stand up), press « VALIDATE ».
- If you are willing that the member of your triad with rank 1 be called to the front of the room, press « STAND UP » and validate your decision.

If at least two members of the triad have pressed « STAND UP », the member with rank 1 will be called to the front of the room to be applauded by all the participants before being sent back to their seat. In this case, the members who have chosen « STAND UP » will pay a cost of 10 ECU that will be deducted from their payoff in this part.

In all the other cases, the regular process applies. The member of your triad with rank 1 will not be called to the front of the room. Payoffs will not be modified.

You will be informed of the decision of each of your triad members, together with their score and their rank.

A questionnaire about your current feelings will be displayed on your computer screen both after you have made your decision and after the participants with rank 1 have come back to their seat.

If you have any question regarding these instructions, please raise your hand. We will answer to your questions privately.

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#### **Part 4** (*distributed after completion of the previous part*)

The rules that apply in this part are the same as in Part 2. We ask you to perform the same task as previously during 4 minutes. You will be paid 100 ECU in this part. Once the 4 minutes have elapsed, your screen will display your score and your rank within the triad in this part. You will be also informed of the score and the rank of each of the two other triad members. Then, a questionnaire about your current feelings will be displayed on your computer screen.

Finally, you will be requested to fill out a post-experimental questionnaire and you will be invited to proceed to the payment room.

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## APPENDIX 2 – Instructions for the Praise – Shaming Treatment (translated into Chinese)

We thank you for participating in this experiment in decision-making. It is forbidden to talk to the other participants throughout the session.

We will first ask you to describe the feelings you experience right now. Your screen will display a series of 10 statements. For each statement, we ask you to choose a number between 1 and 7 (included) to describe how you feel right now.

The choice of a higher number indicates that you experience this feeling with a higher intensity. For example, choosing number 1 indicates that you do not experience this feeling at all. At the opposite, choosing number 7 indicates that you experience this feeling with a very high intensity. Intermediate values are indicated by the choice of intermediate numbers.

Do not spend too much time on any one statement; simply choose the number which seems to describe your present feelings best.

The 10 proposed statements are the following:

- I feel angry
- I feel contempt
- I feel ashamed
- I feel envious
- I feel sad
- I feel happy
- I feel guilty
- I feel grateful
- I feel fearful
- I feel relieved

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### **Instructions (cont'd) (distributed after completion of the initial elicitation of feelings)**

The remaining of this session consists of several parts. You will receive the instructions for each part after completing the previous part.

During these parts, the amount of money you will earn may depend upon your actions and the actions of the other participants you will interact with. Throughout the session, your earnings will be given in ECU (Experimental Currency Units). At the end of the session, your total earnings in ECU will be the sum of your payoffs earned in each part. These earnings will be converted into RMB at the rate:

$$10 \text{ ECU} = 1 \text{ RMB}$$

Your earnings will be paid to you in cash and in private at the end of the session.

#### **Part 1**

At the beginning of this part and throughout the session, the participants are grouped into triads. **The composition of your triad will remain constant throughout the session.** You will not be informed on the identity of the two other members of your triad.

During this part, we ask you to perform a task on your computer during 4 minutes. This task consists of moving apples into a basket with your mouse.

Each apple moved into the basket will increase your score by one unit. Your current score (i.e. the current number of apples in the basket) as well as the remaining time will be displayed on your screen continuously.

Once the 4 minutes have elapsed, your screen will remind you your score in this part. You will not be informed of the scores of your two other triad members.

You will be paid 100 ECU in this part.

Before starting performing the task, you will be allowed to practice this task during 2 minutes. The performance in this practice period will not be taken into account in your score of this part.

At the end of this part, a questionnaire about your current feelings will be displayed on your computer screen. To fill out this questionnaire, the rules are the same as previously.

If you have any question regarding these instructions, please raise your hand. We will answer to your questions privately.

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### **Part 2** (*distributed after completion of the previous part*)

In this part, the composition of your triad is the same as in the previous part.

We ask you to perform the same task on your computer as previously during 4 minutes. You will be paid 100 ECU in this part.

The difference with the previous part is that once the 4 minutes have elapsed, your screen will display your score and your rank within the triad in this part.

The rank 1 will be assigned to the triad member who has performed the highest score.

The rank 3 will be assigned to the member who has performed the lowest score.

The rank 2 will be assigned to the member who has performed the intermediate score.

In case of ties between two or three triad members, the ranks will be assigned randomly between the ties.

You will be informed of the score and the rank of each of your two other triad members.

Last, a questionnaire about your current feelings will be displayed on your computer screen.

If you have any question regarding these instructions, please raise your hand. We will answer to your questions privately.

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### **Part 3** (*distributed after completion of the previous part*)

In this part, the composition of your triad is the same as in the previous parts.

We ask you to perform the same task on your computer as previously during 4 minutes. You will be paid 100 ECU in this part.

Once the 4 minutes have elapsed, your screen will display your score and your rank within the triad, as well as the score and the rank of each of the two other triad members.

A difference with the previous part lies in the fact that **rank 1 (the highest score)** may be requested to stand up, to move forward to the front of the room to be applauded by all the participants, one by one, before being sent back to their seat.

Next, the participants who have got **rank 3 (the lowest score)** in each triad will be requested to stand up, to move forward to the front of the room, one by one, before being sent back to their seat.

However, you will be able to modify the regular process by your decisions. Indeed, after being informed on the assignment of ranks, you will decide whether you prefer that the member of your triad who has got rank 1 is called to the front of the room to be applauded by all the participants.

- If you are willing that the regular process applies (rank 1 does not stand up), press « VALIDATE ».



- If you are willing that the member of your triad with rank 1 is called to the front of the room to be applauded, press « STAND UP » and validate your decision.

If at least two members of the triad have pressed « STAND UP », the member of your triad who has got rank 1 will be called and will go to the front of the room to be applauded by all the participants. In this case, the members who have chosen « STAND UP » will pay a cost of 10 ECU each that will be deducted from their payoff in this part.

In all the other cases, the member of your triad with rank 1 will not be called to the front of the room. Payoffs will not be modified.

You will be informed of the decision of each of your triad members, together with their score and their rank.

A questionnaire about your current feelings will be displayed on your computer screen both after you have made your decision and after the participants with rank 1 have come back to their seat.

Then, you will decide whether you let the process apply or whether you prefer that the member of triad who has got **rank 3 (the lowest score)** is not called to move forward to the front of the room, one by one, before being sent back to his seat.

- If you are willing that the regular process applies, press « VALIDATE».
- If you are not willing that the member of your triad with rank 3 be called to the front of the room, press « NO STAND UP » and validate your decision.

If at least two members of the triad have pressed « NO STAND UP », the member with rank 3 will not be called to the front of the room to be identified by all the participants before being sent back to their seat. In this case, the members who have chosen « NO STAND UP » will pay a cost of 10 ECU that will be deducted from their payoff in this part.

In all the other cases, the regular process applies. The member of your triad with rank 3 will be called to the front of the room. Payoffs will not be modified.

You will be informed of the decision of each of your triad members, together with their score and their rank.

A questionnaire about your current feelings will be displayed on your computer screen both after you have made your decision and after the participants with rank 3 have come back to their seat.

If you have any question regarding these instructions, please raise your hand. We will answer to your questions privately.

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#### **Part 4** (*distributed after completion of the previous part*)

The rules that apply in this part are the same as in Part 2. We ask you to perform the same task as previously during 4 minutes. You will be paid 100 ECU in this part. Once the 4 minutes have elapsed, your screen will display your score and your rank within the triad in this part. You will be also informed of the score and the rank of each of the two other triad members. Then, a questionnaire about your current feelings will be displayed on your computer screen.

Finally, you will be requested to fill out a post-experimental questionnaire and you will be invited to proceed to the payment room.

## APPENDIX 3 – Instructions for the Shaming – Praise Avoidance Treatment (translated into Chinese)

We thank you for participating in this experiment in decision-making. It is forbidden to talk to the other participants throughout the session.

We will first ask you to describe the feelings you experience right now. Your screen will display a series of 10 statements. For each statement, we ask you to choose a number between 1 and 7 (included) to describe how you feel right now.

The choice of a higher number indicates that you experience this feeling with a higher intensity. For example, choosing number 1 indicates that you do not experience this feeling at all. At the opposite, choosing number 7 indicates that you experience this feeling with a very high intensity. Intermediate values are indicated by the choice of intermediate numbers.

Do not spend too much time on any one statement; simply choose the number which seems to describe your present feelings best.

The 10 proposed statements are the following:

- I feel angry
- I feel contempt
- I feel ashamed
- I feel envious
- I feel sad
- I feel happy
- I feel guilty
- I feel grateful
- I feel fearful
- I feel relieved

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### **Instructions (cont'd) (distributed after completion of the initial elicitation of feelings)**

The remaining of this session consists of several parts. You will receive the instructions for each part after completing the previous part.

During these parts, the amount of money you will earn may depend upon your actions and the actions of the other participants you will interact with. Throughout the session, your earnings will be given in ECU (Experimental Currency Units). At the end of the session, your total earnings in ECU will be the sum of your payoffs earned in each part. These earnings will be converted into RMB at the rate:

$$10 \text{ ECU} = 1 \text{ RMB}$$

Your earnings will be paid to you in cash and in private at the end of the session.

#### **Part 1**

At the beginning of this part and throughout the session, the participants are grouped into triads. **The composition of your triad will remain constant throughout the session.** You will not be informed on the identity of the two other members of your triad.

During this part, we ask you to perform a task on your computer during 4 minutes. This task consists of moving apples into a basket with your mouse.

Each apple moved into the basket will increase your score by one unit. Your current score (i.e. the current number of apples in the basket) as well as the remaining time will be displayed on your screen continuously.

Once the 4 minutes have elapsed, your screen will remind you your score in this part. You will not be informed of the scores of your two other triad members.

You will be paid 100 ECU in this part.

Before starting performing the task, you will be allowed to practice this task during 2 minutes. The

performance in this practice period will not be taken into account in your score of this part.

At the end of this part, a questionnaire about your current feelings will be displayed on your computer screen. To fill out this questionnaire, the rules are the same as previously.

If you have any question regarding these instructions, please raise your hand. We will answer to your questions privately.

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### **Part 2** (*distributed after completion of the previous part*)

In this part, the composition of your triad is the same as in the previous part.

We ask you to perform the same task on your computer as previously during 4 minutes. You will be paid 100 ECU in this part.

The difference with the previous part is that once the 4 minutes have elapsed, your screen will display your score and your rank within the triad in this part.

The rank 1 will be assigned to the triad member who has performed the highest score.

The rank 3 will be assigned to the member who has performed the lowest score.

The rank 2 will be assigned to the member who has performed the intermediate score.

In case of ties between two or three triad members, the ranks will be assigned randomly between the ties.

You will be informed of the score and the rank of each of your two other triad members.

Last, a questionnaire about your current feelings will be displayed on your computer screen.

If you have any question regarding these instructions, please raise your hand. We will answer to your questions privately.

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### **Part 3** (*distributed after completion of the previous part*)

In this part, the composition of your triad is the same as in the previous parts.

We ask you to perform the same task on your computer as previously during 4 minutes. You will be paid 100 ECU in this part.

Once the 4 minutes have elapsed, your screen will display your score and your rank within the triad, as well as the score and the rank of each of the two other triad members.

A difference with the previous part lies in the fact that the participants who have got **rank 3 (the lowest score)** in each triad will be requested to stand up, to move forward to the front of the room, one by one, before being sent back to their seat.

Next, the participants who have got **rank 1 (the highest score)** in each triad will be requested to stand up, to move forward to the front of the room, one by one, to be applauded by all the participants, before being sent back to their seat.

However, you will be able to modify the regular process by your decisions. Indeed, after being informed on the assignment of ranks and before participants with **rank 3 (the lowest score)** are called to the front of the room, you will decide whether you let the regular process apply or whether you prefer that the member of your triad who has got rank 3 is not called to the front of the room.

- If you are willing that the regular process applies, press « VALIDATE ».
- If you are not willing that the member of your triad with rank 3 is called to the front of the

room, press «NO STAND UP » and validate your decision.

If at least two members of the triad have pressed « NO STAND UP », the member of your triad who has got rank 3 will not be called and will not be identified in the room. In this case, the members who have chosen « NO STAND UP » will pay a cost of 10 ECU each that will be deducted from their payoff in this part.

In all the other cases, the regular process applies. The member of your triad with rank 3 will be called to the front of the room. Payoffs will not be modified.

You will be informed of the decision of each of your triad members, together with their score and their rank.

A questionnaire about your current feelings will be displayed on your computer screen both after you have made your decision and after the participants with rank 3 have come back to their seat.

Then, you will decide whether you let the process apply or whether you prefer that the member of triad who has got **rank 1 (the highest score)** is not called to the front of the room to be applauded by all the participants.

- If you are willing that the regular process applies, press « VALIDATE».
- If you are not willing that the member of your triad with rank 1 be called to the front of the room, press «NO STAND UP » and validate your decision.

If at least one member of the triad has pressed « NO STAND UP », the member with rank 1 will not be called and will not be identified in the room. In this case, the members who have chosen « NO STAND UP » will pay a cost of 10 ECU that will be deducted from their payoff in this part.

In all the other cases, the regular process applies. The member of your triad with rank 1 will be called to the front of the room, and then, s/he will be applauded and s/he will come back to his/her seat. Payoffs will not be modified.

You will be informed of the decision of each of your triad members, together with their score and their rank.

A questionnaire about your current feelings will be displayed on your computer screen both after you have made your decision and after the participants with rank 1 have come back to their seat.

If you have any question regarding these instructions, please raise your hand. We will answer to your questions privately.

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#### **Part 4** (*distributed after completion of the previous part*)

The rules that apply in this part are the same as in Part 2. We ask you to perform the same task as previously during 4 minutes. You will be paid 100 ECU in this part. Once the 4 minutes have elapsed, your screen will display your score and your rank within the triad in this part. You will be also informed of the score and the rank of each of the two other triad members. Then, a questionnaire about your current feelings will be displayed on your computer screen.

Finally, you will be requested to fill out a post-experimental questionnaire and you will be invited to proceed to the payment room.

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# General Conclusion

This thesis consists of one chapter on the relationship between people's risk attitudes and their migration status and two chapters exploring whether people are willing to preserve self- or others' image at a cost to themselves and whether reciprocity also exists in terms of image.

Investigating risk attitudes is of critical importance to understand migration and other economic and social behavior. Risk attitudes are correlated with people's deliberation and could be traced to different sources of uncertainties. In addition to stable uncertainty and ambiguity, in some circumstances, uncertainty comes from other competitors - People are seeking a job on the job market, the possibility of getting a job is not only determined by their application decisions but also by other candidates' applications. Exploring risk attitudes and distinguishing which kind of uncertainty accounts for people's behavior are essential to shed light on economic and social behavior.

In the other two chapters, we were curious to explore the influence of social image – whether or not people are concerned with how others perceive their behavior. Social image and peer pressure are important devices to incentivize people's effort

provision. The source of the influence of social image could be traced to people deriving ego utility. If people know it is of critical importance for themselves and others to preserve their image especially under public conditions, the first question raised is whether or not people are willing to sacrifice part of their monetary payoffs to save own or others' face. The decision about the public exposure of self- or others' negative image allows us to observe their trade-offs between monetary payoffs and image utility. People's willingness to maintain the privacy of others' low performance in sacrificing their own monetary interests also deepens our understanding of pro-sociality. Subsequently we further explored whether or not in-group/out-group affiliation has an influence on people's decisions to preserve others' face. Finally we studied whether the public exposure of somebody's low performance crowds out their effort provision in the future.

The last question investigated in this dissertation is whether or not people reciprocate in terms of image and how the availability of such interactions in the non-monetary domain influences effort provision. Reciprocal behavior in the pecuniary perspective has been regularly observed in economic and social interactions, the consideration of others' pecuniary interests results in others' higher willingness to reward, while disregarding others' pecuniary interests leads to others' higher likelihood to punish. In line with findings of chapter two, the third chapter of this dissertation pushes forward the investigation of reciprocal behavior in terms of image. If people have the opportunity to avoid somebody's embarrassment and they do it at a personal cost, does somebody reward such a kind behavior? If not, does somebody

punish such an unkind behavior? Indeed, the occurrence of image reciprocity among people reflects the importance of incorporating image into utility function. People behave reciprocally not only in the monetary domain but also in the non-monetary domain like image.

The first essay had run a field experiment in six diversified locations in China including both eastern China and western China. We recruited three different kinds of participants to take part in this experiment. Participants are either 1, migrants in cities; 2, stayers in locations with out-migration; 3, stayers in locations without out-migration. We elicited their risk attitudes towards stable uncertainty, ambiguity uncertainty and strategic uncertainty respectively, and then their demographical characteristics were collected by surveys. Our field experiment shows that migrants demonstrate a significant higher risk attitude over strategic uncertainty while stayers in location with out-migration show a lower risk attitude over strategic uncertainty. This suggests that migration looks like a self-selection process, habitants with a high strategic uncertainty choose to migrate to other regions while habitants with a low strategic uncertainty choose to stay at their hometown. However, habitants in eastern China and habitants in western China show different risk attitudes towards stable risk and ambiguity. The interpretation of this finding is that economic regime could shape individuals' risk attitudes – habitants in eastern China are more used to higher variance in opportunities and wealth due to China's progressive transition to market economy that was initiated in eastern China.

In the second essay, participants have to make decisions to sacrifice part of their

monetary payoffs to avoid the public exposure of self- or other triad members' negative image due to their least performance in a real-effort task. To examine whether social distance influences participants' decisions, the identity of group members is manipulated. Our results show that participants' aversion to the public exposure of a lower relative performance is significant. Furthermore, a significant proportion of participants show sympathy for others' embarrassing situation and pay to avoid the public exposure. The willingness to preserve others' image is stable despite the manipulation of group affiliation among group members.

The third essay studies whether reciprocal behavior occurs in terms of image. Do people reward others' kind behavior in terms of image and punish others' unkind behavior? To test image reciprocity, in our settings, participants could publicly praise somebody who chose to avoid the public exposure of the lower performance or preserve the image of somebody who chose to publicly praise them. To examine indirect reciprocity in terms of image, participants were allowed to publicly praise somebody who chose to preserve the image of a third party or avoid the public exposure of somebody's negative image who chose to publicly praise a third party. In addition, we further explored whether the expectation of image reciprocity induces people to act strategically in the real effort task. First, we find evidence of direct image reciprocity in the positive domain. Individuals tend to publicly praise somebody or avoid somebody's exposure conditional on this person's previous kind behavior in terms of image. Second, indirect image reciprocity in the positive domain is found. Individuals are likely to praise somebody and avoid somebody's exposure if



this person has displayed a kind behavior in terms of image to a third party. Emotional data collected from surveys validate that the sources of image reciprocity originate from participants' emotional fluctuations. Participants being publicly experienced shame while public praise increase happiness. Therefore, a person's effort to avoid others' exposure or to praise good performance is considered as a kind behavior which results in others' positive reciprocity.

The three chapters of my thesis aim to contribute to the understanding of risk attitudes and social-image. Despite of our important contributions to the current literature, there are still a lot of dimensions deserving further investigation.

In the first chapter, although a correlation between risk attitudes and migration has been uncovered, the causal effect is still vague. Strategic uncertainty perhaps accounts for individuals' migration decisions but the exact opposite may actually be also true – migration experience probably reshapes migrants' risk attitudes over strategic uncertainty. Indeed, compared with their counterparts in the rural area, the working and living environment of migrants is a climate filled with strategic uncertainty and competition. The disentangling of the endogenous correlation between risk attitudes and migration is an interesting question still open to answer. A larger sample covering migrants with different migration duration and detailed information about their working and living environment are the key to fill in this research gap.

In the second chapter, we have answered the question whether individuals are willing to preserve self- or others' image at a personal cost. An extension of this paper

is that, how much money individuals are willing to pay to preserve self- or others' image? In addition, it's natural to postulate that individuals are more afraid of the public exposure of their negative image in front of their relatives or friends than somebody with a far social distance. Therefore, it's interesting to investigate whether the monetary cost that individuals are willing to incur to preserve self-image varies depending on who constitutes the audience.

The third chapter studies reciprocal behavior in terms of image. The settings in our experiment are one-shot and perfect information. An extension of this paper is to explore whether individuals perform reciprocal behavior in terms of image in a multi-round setting and how image reciprocal consideration interacts with individuals' effort provision in a dynamical setting. The other question deserving further explore is that do individuals reciprocate someone when individuals don't know someone's decision about the public exposure of their image in the previous stage. This asymmetric information setting is important for us to better understand whether the occurrence of image reciprocity is based on someone's intention.

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## **Abstract**

This thesis consists of one essay on the relationship between risk attitudes and migration and two essays investigating the importance of saving face and reciprocity in terms of social image.

The first essay is based on a field experiment conducted in China to study whether the migration status is correlated with one's preferences regarding risk, ambiguity, and competitiveness. It shows that migrants and stayers exhibit no difference in their preferences over risk and ambiguity as elicited with standard lottery choices. In contrast, migrants are significantly more likely to enter competitive markets in the context of strategic uncertainty.

The second essay studies whether individuals forego resources to avoid the public exposure of the worst performer in their group in a real-effort laboratory experiment. A majority of individuals are willing to pay to preserve both self- and others' image. This finding is robust to a manipulation of group identity. While the threat of exposure encourages effort, public exposure and a feeling of shame crowd out future intrinsic motivation.

The third essay investigates whether individuals reward kindness and punish selfishness in terms of image. It shows that people reward kindness and reciprocate to people who have saved their face or others' face. However, selfish behavior in terms of image saving is not sanctioned.

**Keywords:** Risk attitudes; Migration; Social image; Reciprocity; Experiments

## **Résumé**

Cette thèse est composée d'un essai sur la relation entre l'aversion au risque des individus et leur décision de migration et de deux essais sur l'importance de sauver la face et la réciprocité en termes d'image.

Le premier essai s'appuie sur une expérience de terrain en Chine afin d'étudier si le statut migratoire est corrélé aux préférences en matière de risque, ambiguïté et compétitivité. Il montre que les migrants et les non-migrants ne présentent pas de différences dans leurs préférences concernant le risque et l'ambiguïté dans des loteries standard. En revanche, les migrants ont une attitude plus compétitive face à une incertitude stratégique dans un jeu d'entrée sur un marché.

Le deuxième essai étudie si les individus sont prêts à sacrifier des ressources pour sauver la face en payant pour éviter l'exposition publique du membre de leur groupe le moins productif à l'aide d'une expérience de laboratoire à effort réel. La majorité des individus sont prêts à payer pour préserver à la fois leur image et celle des autres. Ce résultat est robuste à une manipulation de l'identité de groupe. Le sentiment de honte toujours présent à la suite d'une exposition publique évince la motivation intrinsèque.

Le troisième essai étudie la récompense de la bienveillance et la punition de l'égoïsme en termes d'image. Il montre que les individus récompensent la bienveillance et expriment de la réciprocité vis-à-vis de ceux qui ont préservé leur image ou celle d'un tiers. En revanche, l'égoïsme de ceux qui ne font pas d'effort pour sauver la face des autres n'est pas sanctionné.

**Mots clés :** Attitudes face au risque ; migration ; image sociale ; réciprocité ; expériences