The Journal of Socio-Economics 40 (2011) 356–363

Contents lists available at ScienceDirect

The Journal of Socio-Economics

journal homepage: www.elsevier.com/locate/soceco

Group-based trust, trustworthiness and voluntary cooperation: Evidence from experimental and survey data in China

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ARTICLE INFO

Article history:
Received 22 May 2010
Received in revised form 2 February 2011
Accepted 6 April 2011

JEL classification:
C91
C93
D63

Keywords:
Trust
Trustworthiness
Voluntary cooperation
Social capital
risk

ABSTRACT

Trust, trustworthiness and cooperation are crucial in achieving social goals, and are thus essential components of social capital. This paper reports the results of a series of lab and artefactual field experiments carried out in Shanghai to evaluate some of the key indicators of social capital in China. The groups selected for the study are middle school and undergraduate university students and community residents. The experiments comprise two public goods games, a gambling game and a trust game. The overall level of trust is negatively related to age, although trusting behavior is also affected by other factors, such as risk-taking.

1. Introduction

Trust is the lubricant of society (Arrow, 1974) and the foundation of interpersonal communication. The degree of trust within a society is highly correlated with economic growth and the emergence and efficiency of large-scale organizations, including government (Knack and Keefer, 1997; Fukuyama, 1995; La Porta et al., 1997). When members of a society are believed to be trustworthy, trust emerges and becomes the lubricant for the operation of organizations within that society. Transaction costs are relatively lower, and large-scale production, credit, land and labor market transactions more frequent, in societies with a high level of trust. The members of such societies have strong incentives to innovate and to make physical and human capital investments, thereby contributing to socio-economic prosperity and overall welfare. It is clear that the trust relationship plays an important role in the formation of social capital.Pierre Bourdieu formally proposed the concept of "social capital" in the 1980s, and it quickly became influential, with a large body of literature addressing its definition, determinants, impact and effectiveness. To date, however, no consensus has been reached on a definition. Bourdieu (1986) defined social capital as the advantages and opportunities available to and through certain members of the community; Coleman (1990) as the resources available to individuals from their social contacts; and Putnam (1993) as the trust, norms and social relations that exist through coordinated action to improve social efficiency. Woolcock (1998), Rauch and Evans (2000), Stiglitz (1999) and other economists conceptualized social capital as an economic analytical framework and categorized it as a third form of capital, following physical capital and human capital.

Definitions of social capital tend to address the individual level or the community level, and lead to different research approaches, although Carpenter et al. (2004) identified links between the two. Scholars examining the individual level look for behavioral metrics for trust, trustworthiness and cooperation against a background of conflict between social welfare and personal well-being. Their measurements primarily include behavioral and attitudinal survey questionnaires. For example, one question on the widely used General Social Survey (GSS) (i.e., "Generally speaking, would you say that most people can be trusted, or that you can not be too careful in dealing with people?") measures respondents' level of trust. Although research on social capital at the community level is also heavily dependent on questionnaires, the difference is that those adopted tend to be less hypothetical and to focus more on practical issues. A typical question might be: "How many volunteer organizations have you served in?"The two main means of measuring

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doi:10.1016/j.socec.2011.04.007

and analyzing trust found in the literature are the aforementioned GSS and the design and implementation of laboratory or artefactual field experiments (Harrison and List, 2004). Although the use of surveys such as the GSS to collect trust-related information is popular and cost-effective, it is believed to be less reliable than other incentive-compatible methods. The controlled environment of experimental methods, in contrast, is considered to produce more reliable results, but such methods are costly. The relationship between trust attitudes measured in surveys and trust behavior measured in experiments is not clear. Some scholars have found them to be related (e.g., Fehr and Schmidt, 2000), whereas others have conjectured that they are not (e.g., Glaeser et al., 2000). The experimental models most commonly employed to measure trust-associated issues include the public goods game, which is used to measure a participant's degree of voluntary cooperation or willingness to cooperate multilaterally (e.g., Andreoni, 1995); the trust or investment game, which is used to measure participants' trust and the trustworthiness of strangers (e.g., Glaeser et al., 2000); and the gambling game, which is used to elicit participants' risk preferences (e.g., Schechter, 2007).

All three types of experiments have been conducted in various countries, but they are usually carried out separately. Exceptions include experiments exploring trust and the impact of social capital on economic development, which have been conducted in Southeast Asian slums and in Russia, Japan and the United States, and cross-regional comparative studies that have adopted the investment game (Berg et al., 1995), a cooperation measure (Ashraf et al., 2006; Croson and Buchan, 1999; Carter and Castillo, 2002; Barr, 2003) and a voluntary contribution experiment (Gächter et al., 2003).

Wang and Yamagishi (2005) carried out a comparative study of levels of trust between the sexes in China. They found the stronger degree of mutual trust among Chinese male strangers to be based on higher expectations of reciprocity, and the weaker degree among females to be due to the fear of being taken advantage of. Other Chinese scholars have investigated social capital through surveys in conjunction with macro-economic data. Such studies include explorations of the links between social capital and economic development and social capital and financial decision-making. Zhang and Ke (2002), for example, showed trust to be an important factor in the economic development of various Chinese regions. An empirical study carried out by Zhang and Zeng (2005) also reported social capital to have significant positive effects on regional financial development. Zhang (2006) investigated the relationship between China's level of social capital and its financial development, and Chen and Lu (2007) drew on survey data to explore the existence of social capital in Chinese society, with such capital defined by behavior at the social communication network level. They examined newly established grass-roots self-governing communities, and found social capital to be quite abundant in Chinese cities and to have long-term implications for local democratic self-governance.

The study reported herein investigated trust and cooperation through lab and artefactual field experiments with the aim of shedding light on the key components of social capital. These experiments were carried out in four parts. The first part adopted the voluntary cooperation game and employed a public goods experiment to investigate the degree of voluntary cooperation among different cohorts of subjects. The second employed the gambling game to elicit subjects' risk preferences. The third part, which adopted the trust or investment game, explored the degree of trust and trustworthiness among the subjects. Finally, the fourth part again employed the public goods experiment, but this time to examine whether the level of voluntary cooperation had changed after the subjects had witnessed trustworthiness or betrayal. This study has several innovative features, including the following.The study explores the characteristics of trust among different cohorts in one of China's major economic powerhouses. To the best of our knowledge, this has not been documented in the literature.

Adopting a within-subjects design, the study combines the public goods game with the trust/investment game and gambling game. Compared to a between-subject design, a within-subject design is statistically more powerful because it automatically controls for systematic individual differences, which often lead to large variations, hence allowing us to better examine the relations between trust/trustworthiness and voluntary cooperation.The study employs both an experimental method and a general survey method, which enables us to combine the subjects' experimental behaviors with their questionnaire answers in our analyses. The two forms of information complement each other, and the result is greatly enhanced.

Unlike those of most previous studies, the subjects of this study were diversified in terms of their social characteristics, making them more representative of Chinese society as a whole.

The remainder of the paper is organized as follows. Section 2 provides a detailed description of the procedures used in the lab and artefactual field experiments, and Section 3 reports the results of these experiments. Concluding remarks and implications for future work are provided in Section 4.

2. Lab and field experiments

In December 2008, six lab experiments were conducted at Shanghai Jiao Tong University with 60 subjects; in May 2009, four lab-style experiments were conducted in the Chao Yang Secondary School and Jiao Da Secondary School with 80 second-year middle school students; and in July and August 2009, four field experiments were carried out in four Shanghai communities, the Fusi, Xinhua, Station Road and Liu Er communities, with 80 participants. The middle school and university experiments were conducted in regular classrooms, and the community experiments in the clubhouses of the respective communities. The two middle schools are located in different areas of Shanghai, and the four communities are representative of different areas of the city and different income levels.

Each experiment consisted of four parts. Each subject was randomly assigned an ID number and then placed into a group. Each university student group included 10 students, each middle school group 20 students, and each community group 20 community residents. The part-one experiment was a five-round public goods game. Subjects were provided with written instructions, recording and reporting sheets, and a payoff illustration. The university students used a payoff table to calculate their earnings, whereas the middle school students and community participants used a payoff function instead for the sake of simplicity. The instructions provided to the different groups were also modified according to their different levels of understanding.

Certain words that are associated with intentions or suggestions, such as "contribution," "community" and "assist," were avoided in the instructions. The subjects were first asked to read the instruction sheet while one of the experimenters read it aloud to make sure it was understood by all. They were then asked to make investment decisions in five rounds.

Each subject was given 10 tokens as an endowment and had to decide the amounts to invest and to save. A subject could either keep 10 tokens for himself or herself or chose q_i ($0 \le q_i \le 10$) tokens to invest and kept the remaining 10-q_i tokens. The payoff for each subject i in the group of n subjects is given by:

$$\pi_i^1 = 10 - q_i + a\sum_{j=1}^{n} q_i, \quad 0 < a < 1 < na \tag{1}$$