A Theoretical Framework and Experimental Program for Understanding Rule Preference, Fairness Cognition and Trust

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Abstract

Based on the latest literatures, the paper proposes one theoretical framework: individuals pay general attention to rules of game and allocation process, but not just to results, produce fairness cognition for different resource allocation schemes through rules preferences and behavior expectation about partner and decide whether to accept allocation results; individual trust level is significantly associated with pro-society of partner, while this significance degree of correlation depends on fairness cognition. To further check existence of rules preferences and the influential factors, the paper designs one dictator game with veto purchasing (it can be converted into ultimatum game with decision position of both parties relatively more equal through purchasing and exercising veto) and trust game experiment, and sorts according to the veto bidding through inducing participants to state preference for two kinds of rules of game, measures fairness cognition for allocation scheme and tests role of two above on trust decision.

Key words: Rules preferences; Fairness cognition; Trust experiment; Veto purchasing

INTRODUCTION

In *Rationality and Freedom* of Amartya Sen, "Regarding preference as foundation has more sufficient power in decision of personal private life compared with decision of other types, because private life does not directly affect other people. Individual desire is to make sufficient cause of selection in his own private sphere, but it is not full cause of selection any more in others' private sphere or public sphere." (Sen, 2006, p. 370). In that case, except preference, what factor does human choice in public sphere come from? Emerging experimental economics provides some standard setting studying this problem such as dictator game, ultimatum game and trust game. Through experiment setting exceeding private sphere, researcher characterizes social preference different from self-interest preference and uses it in analyzing individual choice behavior. This gives us the opportunity to more deeply understand forming and maintenance of human cooperation behavior in public sphere.

Trust provides stable behavior expectation for cooperation in interpersonal communication. Early behavioral economics uses result-based social preference model (outcome-based social preference) and performs preliminary study on this; some studies also found that, cause of trust lies in social preference "paying close attention to other people and paying close attention to behavior cause of process"(Abdulkadirolu & Bagwell, 2013; Berg, Dickhaut, & Mccabe, 1995; Bowles, 2004; Cox, 2004; Karlan, 2005). However, social preference is not a castle in the air, and will change accordingly with the changes of concrete environment and individual cognition. In the meantime, rules preferences come within the economists' vision, change in game position of both parties, reputation set up by repeated game, matching way, communication and learning, and other relative rules will

affect level of trust and cooperation. Preference for rules will even affect evolution process of the human society under grand view.

The problem is that, even continuously bringing rules preferences into result-based social preference model just enlarges the scope of social preference, on one hand, it cannot reflect how individuals to self-reflect and adapt under preferred rule; on the other hand, only concentrating on one or multiple factors affecting cooperation degree would be biased sometimes. At the same time, few people study and pay attention to how to produce and evolve such basic rationality problems for cooperation after isolation heterogeneity, situation, rules and pro-society degree and other factors. Even so, using current social preference model to study perspective of trust is still based on behavior utilitarianism. We hold the opinion that, only under the view of standard utilitarianism, can social equity known by human rationality through concrete rules be the root of trust.

Then, after introducing social preference and rules preferences, how do we select associated decision-making process through investigation and preferences, faith and action, thereby providing one micro foundation with empirical support for individual decision-making theory? In this way, the paper designs one dictator game with veto purchasing (it can be converted into ultimatum game through veto purchasing) and trust game experiment, to answer how procedural fairness cognition to affect trust in individual interaction, namely, through inducing participants to state endogenous preference for two kinds of rules of game, it measures cognition for whether to be fair for allocation scheme, and further uses this fairness cognition to clearly know forming mechanism of interpersonal trust decision.

The rest of the paper is arranged as below: firstly narrate based on relative literatures, give our preliminary theoretical framework, then report one experiment design plan and procedure to be implemented, and finally discuss conclusion and prospect.

1. INVESTIGATE THEORETICAL FRAMEWORK OF FAIRNESS COGNITION AND TRUST BASED ON RULES PREFERENCES

Competition or cooperation is eternal choice of human individuals in collective life. Under the assumption of "rational economic people", individual rationality causing irrational social dilemma of collective always seems to make competition become result of this choice. However, during actual social communication process, different from egoism followed by "rational economic people", individuals do not make decision blindly showing material benefit maximization many times, but have motivation of altruism at most of time when making decision. *The*

economic approach to human behavior of Gary S. Becker pioneers rational choice model to interpret altruism preference, thereby making economics analyzing altruism behavior become possible. With behavior and experiment economics developing, through a number of studies, social preference is tried to be introduced into rational choice model, such as Rabin (1993), Fehr and Schmidt (1999) and Bolton and Ockenfels (2000). Charness and Rabin (2002) build one equation containing many social preference factors, use reciprocity factor, allocation preferences factor and other factors to investigate the influence on actor function. These models expand traditional rational choice model along Gary S. Becker route, but the social preference is just exogenously given, and still explains relationship between human choice object and subject under neoclassical economics "rational economic people ", and does not involve interactive relationship between subject and object and between subjects of real human behavior decision-making. These defects do not prevent using social preference and explaining each kind of non-competitive cooperation behavior based on it, but it is still necessary to investigate formation mechanism of social preference at deeper level.

1.1 Explanation of Social Preference Experiment for Trust Level and Trustworthiness

Understanding forming mechanism for community cooperation of trust through social preference has undoubtedly important significance; a number of literatures of experiment economics commence this problem centering on trust game experiment. Earliest trust game experiments were from Berg et al. (1995)[1]. The experiment setting is similar to trust game of the paper: investment of the principals for the agent is added three times, the agent chooses to return to the principals. They also found that, return amount of the agent is at least as much as investment amount of the principals, so reciprocal preferences explain motivation for investment of the principals and return of the agent. Cox (2004) decomposed standard trust game experiment into three-in-one small game, found that investment and return in game are not only affected by reciprocal preferences, but also may be affected by risk preference, altruism preference and demographics factor.

Method of Butler, Giuliano, and Guiso (2012) is similar to the paper to some degree. Their analysis logic is based on conclusion of Gneezy (2005)—"Moral preference will be affected by the strength of malicious act harming other people, and further decides cognition of people for cheating and finally affects decision policy

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[1]Experiment method measures revealed preference, while another method investigates stated preference through questionnaire. However, the latter is controversial, e.g., Karlan (2005) and Butler et al. (2012). Glaeser, Laibson, Scheinkman, and Soutter (2000) think that, experiment method can better measure trust or reciprocity of people under specific environment.

of the agent". Trust game setting used by them deepens experiment results of Cox (2004). They use cognition of participants for whether decision of the opposite side to be "cheating", and extract how values of "competition" and "cooperation" to affect cognition for "cheating" through questionnaire. The bigger the "cooperation" proportion in values is, the higher the cognition degree for the "cheating" is. Only higher trust level and trustworthiness of opposite side can be regarded as proper behavior, thereby deciding affecting subsequent decision. The bigger the "competition" proportion in values is, the lower the cognition degree for "cheating" is, namely, both lower trust level and trustworthiness will be regarded as proper behavior, thereby affecting subsequent decision.

However, there are two problems existing in this literature using this social preference to study trust.

Firstly, under changeable environment, trust motivation forming mechanism changes, then are these conclusions using social preference to study trust still steady? Under different situations, cognition and decision of individual on environment also will significantly change. Tversky and Kahneman (1986) proposed framing effect to explain variable preference, namely, because individual preference is caused and formed from decision background, decision procedure and other situational framework, change of situation will make individual preference change and even reverse. Not only that, affected by frame, individual decision can be finally formed through evaluation process. Recent experiment also shows that personal preference will obviously reverse under specific situation. E.g., Fershtman, Gneezy, and List (2012) even found that aversion for equality: when specific environment encourages competition and affirms caused inequality is fair, participants will show very strong competition and selfish preference, but not inequity aversion. Bolton and Ockenfels (2006) proposed three kinds of judgment, used for proving no existence of one general social motivation collection independent from the situation: not all individuals measure fairness using same way; There is close relationship between fairness and reciprocity; specific system type will make individual decision behavior deviate from own preference characteristics.

Secondly, many scholars come to realize that, such result-based social preference model only stresses aversion influence efficacy of people on unequal results. In fact, the process producing inequality and cognition of participants during process realizing allocation result have key role on how people to evaluate this inequality[2]. That is to say, people's demands of fairness has significant effect on the function, furthermore, standard of people regarding fairness depends on wealth inequality of people is process of generation, rather than inequality degree of wealth level on simple result.

1.2 Influence of Rules Or Procedures on Decision Making

In recent years, some experiment economics literatures have already noticed that result-based social preference model cannot give reasonable and consistent explanation for many phenomena, concrete selection process and procedure has indelible importance for social preference of individuals and cooperation between individuals. In this way, the paper investigates how selected process and procedure to affect social preference of people and cooperation between people, so it is necessary to briefly comb these literatures.

Classical literatures of Charness and Rabin (2002) provide some experiment results to prove that attraction of same allocation result is very different for participants: same allocation result. In different reference system, people have very different understandings for the fairness degree. This makes economists reflect whether to simplify fairness consideration into inequity aversion to be proper or not. Allocation scheme of dictator reflects cognition of participants for fairness, while such cognition is not stable and has more to do with the concrete environment. List (2007) uses dictator game to simply expand and prove this point. In standard dictator game, 71% dictators choose to transfer some of five dollars to the opposite side. However, when dictator has the opportunity taking five dollars away from the opposite side at the same time, only 10% dictators choose to transfer some of arning to the opposite side. Under the latter situation, cognition of dictator for fairness is obviously different from the former: they will think that choosing not to take five dollars from the opposite side is very fair. Many experiments based on dictator game such as Dana, Cain, and Dawes (2006), Dana, Weber, and Kuang (2007), Oberholzer-Gee and Eichenberger (2008) and Andreoni and Bernheim (2009) equally illustrate that concrete process and motivation have more fundamental influence on fairness cognition compared with results. Bolton, Brandts, and Ockenfels (2005) more directly proves importance of procedural fairness and uses experiments to demonstrate that people attach more importance to process fairness but not to results[3].

These literatures enrich and expand social preference model in early period, but some problems still exist. Firstly, procedural preference and function of participants

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[2]In fact, some studies such as Dufwenberg and Kirchsteiger (2004); Falk and Fischbacher (2006) use intention-based model to study cooperation between people, but finally restore cooperation reciprocity and faith about others.

[3]Wherein, proponent has two options: A (1800, 200) or C (200, 1800), proponent choosing to accept or refuse causes that both parties gain nothing. While in final ultimatum game of another standard, only difference is that, proponent also has another choice B (1000, 1000). While the third game is final ultimatum game of fairness, proponent cannot choose B, and can choose A or C and another risk choice, as soon as responder accepts it, with probability of 50: 50, allocation of both parties will be (1800, 200) or (200, 1800). In the third game, two kinds of results of risk choice are not fair, but the process is fair, because it gives fair risk probability distribution and expected revenue. Reject rate for A in the first game is only 6%, while reject rate for A in the latter two is up to 41%, this is obviously consistent with understanding of previous literatures for fairness cognition. Reject rate for B in the second game and for risk choice in the third game is almost 0.

are indirectly measured in experimental setting of these literatures and are reflected by passive action selection. Secondly, among these literatures, it is hard to show rules faced by participants under concrete situation and how choice made under corresponding rules to interact with inner moral evaluation and fairness cognition. While the paper reflects how endogenous selection rules to interact with individual inner moral evaluation and fairness cognition through experiment device with veto purchasing mechanism, thereby inheriting and developing social preference theory.

1.3 Study Idea of the Paper

Above problems are generated by neglect of neoclassical economics rationality visions for value rationality for long time. Rationality selection theory under neo-classic emphasizes existence of self with rationality as main body according to "self-centeredness welfare", "self-centeredness target" and "self-set goal selection". Sen thinks that, these three aspects do not clarify whether individual goal to contain measures of welfare for others. Therefore, Sen expands role of rationality in rational choice theory, "the place of personal reasoning and self-examination playing role—the substantial place playing role. One man is one entity which can enjoy consumption, experience and predict the welfare and has goals, as well as one entity which can examine the value and goal and select according to these values and goals" (Sen, 2006, p. 25), this is reasonable review.

In fact, intention and faith of participants during generation process of equality or inequality allocation result has a key role on how to evaluate allocation status. That is to say, whether allocation to be fair or not is essential for people function feeling, while identification of people for whether to be fair depends on how to form allocation process and rules, but not single physical benefit allocation result. Key factor concerning social preference of others lies in that, evaluation of status depends on how other people experience such status[4]. Accordingly, value rationality contains evaluation and concern about welfare of others, just like in Theory of Moral Sentiments by Adam Smith, foundation of moral judgments is described as one "fair observer", it is regarded as "rational, moral and conscientious people in your heart, and great judges and arbitrators judging our behavior" (Smith, 1997, p. 165).

In experimental setting of the paper, through inducing participants costly choose whether to have veto, the paper characterizes rules preferences for higher power value, expresses cognition for fairness allocation proportion through selectively exercising veto, and further

investigates how this fairness cognition to affect trust level of the principals and trustworthiness of the agent in trust game. Through such setting, we can more deeply understand role of value rationality played by fairness cognition.

In a word, motivation of people is embedded in concrete game environment and procedure, therefore, how people to evaluate fairness and make interaction decision with others according to fairness standard also depend on concrete game environment and procedure. The paper inherits and develops this idea, also emphasizes influence of fairness cognition for decision behavior motivation especially for interpersonal trust under rules preferences.

2. EXPERIMENTAL DESIGN SCHEME

The experiment is divided into four modules: firstly, declaration and signature of voluntarily participating and questionnaire about sexuality, age, professional and other personal information. Secondly, after experimenter reads the instructions of experiment and guarantees participants to understand experiments, he shall carry out test of control problems, to help participants better understand calculation of benefit payment in lab. Thirdly, formal experiment, including two stages:

The first stage is about veto purchasing, randomly two-by-two matched participants will be respectively regarded as proponent and responder for allocating wealth W of specific amount. Allocation rule corresponds to dictator game or ultimatum game; if responder uses initial endowment given before experiment to purchase veto (as soon as veto is exercised, both parties gain nothing) for proponent allocation scheme, then game that participants take part in is ultimatum game; if responder does not use initial endowment to purchase veto, then game that participants take part in is dictator game. In description of experiment, participants are prohibited from communicating with others during experiment process. Specific decision making order is as below:

a) Proponent and responder respectively have initial endowment of 10 bargaining chips. Responder firstly acts, costly choose whether to purchase veto for proponent plan, bi is recorded as $cost \in [0, 10]$ (taking 0 means giving up purchasing), the higher the bid is, the bigger the probability purchasing veto is; after veto is purchased, select whether to exercise veto after proponent acts[5]. Proponent does not know decision behavior of responder whether to purchase veto when making decision.

b) Proponent goes into action, under the premise that

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proponent does not know whether responder to select purchasing veto or whether veto have been purchased, determine allocation proportion of *offer* ∈ [0, 1] and distribute wealth with maximum W to responder.

c) After proponent selects allocation scheme, responder finds wealth proportion allocated by proponent, then chooses whether to exercise veto. Of course, participants without purchasing veto can only accept the proposal according to dictator rules of game.

d) Participants change roles and continue veto purchasing again.

The second stage is trust game, after veto purchasing of the first stage is ended, matched participants enter trust game experiment. Different from veto purchasing of the first stage, at this stage, trust game between participants is made only once, roles are not changed. We use *p* to represent the principals in trust game, *a* to represent the agent in trust game, accordingly use *p* and *a* to refer to the principals and the agent at trust game stage, which are respectively used as decision of proponent or responder at the first stage. In trust game, the principals have wealth with initial endowment of 50, while initial endowment of the agent is zero. The principals decide to give the agent *choice* ∈ [0, 50] investment, investment received by the agent will be added three times. Then the agent will decide the amount of return *return* ∈ [0, 3*choice*] to the principals. Therefore, for both parties, optimal decision is the principals' investment *choice=50*, return amount of the agent *return*=75. Specific decision making order is as blow:

a) Before formally performing trust game experiment, under the situation not knowing own identity yet, all participants shall firstly carry out analog experiments of four options to measure the declarative preference (stated preference):[6]

(1) If regarding oneself as the principals, how much investment will be made to the agent?

(2) If regarding oneself as the principals, based on (1) selected investment, how much shall the agent return?

(3) If regarding oneself as the agent, based on (1) selected investment, how much do you return?

(4) If regarding oneself as the agent, when the principals invest all 50 wealth to you, how much do you return?

After analogue experiment of four options are finished, real trust game experiment is started.

b) The principals select *choice* ∈ [0, 50] investment to the agent, investment received by the agent will be added three times.

c) The agent decides to return *return* ∈ [0, 3*choice*] to the principals, experiment is ended.

The fourth module: after formal experiment tasks of two stages are finished, bargaining chip earned by participants taking part in game is exchanged for money, experiment is ended. See Figure 1.
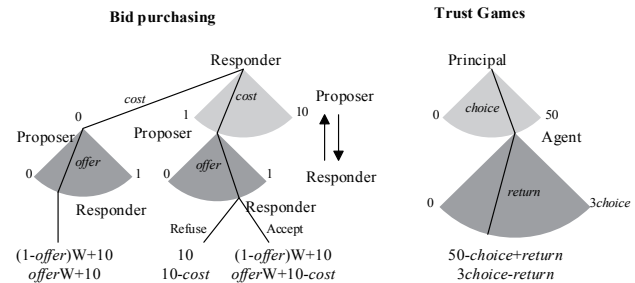

Figure 1
Experimental Procedures

CONCLUSION AND PROSPECT

Trust makes that behavior of both parties can be expected and consensus is formed. Trust between people and between people and organization exceeds acquaintance society; it can make market order expanded. Previous studies give many deep insights. However, it does not more deeply understand faith occurrence and evolution mechanism from rules of endogenous and interaction between personal inner preference, faith and value judgment. Based on economic decision models of preference, faith and behavior, from social preference, the paper analyzes and pays attention to rules preferences of process and tries to test influence of preference and faith for trust decision in lab.

Through using inequality relationship of different level reflected by dictator game and ultimatum game, we firstly investigate whether individuals to have rules preferences and sort according to the price to be paid and fairness cognition for allocation proportion. Then, trust game investigates trust level of both participating parties and motivation of two decision behavior of trustworthiness. We try to restore motivation of decision behavior into value judgment under cognition rationality, thereby showing human rationality problem affecting substance of trust and cooperation presented. Compared with existing social preference model, explanation of the paper is close to rational connotation contained by "Fair observer" of Adam Smith and "reasonable review" of Sen to some degree.

Furthermore, environment nature of lab still cannot more comprehensively reflect complexity in true social communication, but still has some value for exploring targeted issue. Based on trying to overcome compact form of model and purity of preference which can be characterized, one-time game is to be expanded to repeated game and external or internal incentive measures are to be added in trust game in the future, thereby

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[6]True simulation options do not only include three involved in the paper, but also contain others, (1) If regarding oneself as the agent, how much does him return to principal; (2) In case of being principal himself, how much do you think the agent will the agent return? In fact, analog experiment involved in trust game experiment is more like one questionnaire, so that participants can clarify rules.

restoring human rationality and value judgment affecting social communication under more realistic environment.

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