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**TRUST GAME IN TEACHING ECONOMIC PSYCHOLOGY IN
UNIVERSITY: RESULTS OF EMPIRICAL INVESTIGATION**

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Abstract

The article is devoted to the description of the results of the laboratory experiment included into the course “Economic Psychology”. In this experiment students took part in the study of the level of trust and trustworthiness in financial transactions with an anonymous partner. Following methods of investigation were used: the computer technique “Trust Game”, the questionnaire «Basic Assumptions – version for Russian respondents». The results of the investigation showed that basic assumption «world is benevolent and reliable», as well as evaluating oneself as a valuable and successful person, are associated with a greater willingness to trust the partner for interaction. A high level of trust correlates with a high level of trustworthiness. Differences in the level of trust and level of trustworthiness in anonymous interaction between men and women have not been revealed. Basic assumptions of women are characterized by higher values for “Benevolence of the world”, compared to the assumptions of men.

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1. Introduction

Modern technologies are actively introduced into the educational process. Numerous Massive Open Online Courses (MOOC), for example, are available in almost all major universities. However, even with the provision of technology-enhanced tools, it is necessary to pay attention to additional techniques that can help not only to consolidate knowledge, but also to expand them, to stimulate the learner to independently continue his studies. There are three major directions related to the study of the field of innovative technologies in the teaching of disciplines at the university. The first is the use of social networks, the second is the use of e-learning and the third is the use of assessment technologies.

The results of studies of social networks and their role in the learning process are rather contradictory. For example (Nkhoma et al., 2015) investigated the use of Facebook for out-of-class communication between students and instructors and show that it has a negative impact when it comes to the students' perceptions of the quality of the content of student-instructor interaction. However, the use of Twitter was appreciated positively by students (Prestridge, 2014). Other technologies, such as podcasts are also used in the learning process. Podcasts are provided to students to give context to their out-of-class preparation and to allow them to hear directly from the teacher and according to results of study, positively influence the learning process (Taylor, McGrath-Champ, & Clarkeburn, 2012).

Innovative tendencies in educational process also include the use of elements of e-learning. In particular, one of the most common elements of which are screencasts. It was found that students are positive about screencasts, but believe that they should not replace lectures, but only explain complex questions or summarize material (Morris & Chikwa, 2014).

Technologies that are associated with the assessment of students are also part of educational process development. Various tools are used to give students feedback regarding the level of their knowledge (for example, "Plickers" and other programs). One of them was the peer review. According to results of empirical research (Mulder, Pearce, & Baik, 2014), students reported high level of satisfaction with the peer-review process and pointed out its positive impact on their learning. It is clear that feedback is an essential part of educational process, but at the same time, researchers note that «formal» or low-power feedback does not benefit the students (Jones & Gorra, 2013).

The use of role-playing and experiential learning is also of great interest. It was indicated that role-playing and experiential learning are valued by the participants in the distance-learning (Fominykh, Leong, & Cartwright, 2018). We think that simulation of real-life (or professional) situation in educational process can give student valuable experience.

1.1. Trust and trustworthiness theoretical background. Why we study Trust and Trustworthiness?

Trust and trustworthiness of partners are important factors in economic development. With respect to an economic bargain, trust is one of the conditions for its implementation. Trust within the organization reduces costs for monitoring, staff turnover and increases the loyalty of employees (Berg, Dickhaut, & McCabe, 1995).

Dispositional (person-centered) and dyadic (interpersonal) approaches to interpersonal trust conceptualizing were distinguished.

Such individual characteristics as “general beliefs and attitudes about the degree to which other people are likely to be reliable, cooperative, or helpful in experimental game situations” (Simpson, 2007, p.264), constitute trust according to person-centered approach. Low self-esteem, unstructured self-concept and insecure type of attachment can significantly decrease trust in a partner. According to the interpersonal approach, trust is “a psychological state or orientation of an actor (the trustor) toward a specific partner (the trustee) with whom the actor is in some way interdependent (that is, the trustor needs the trustee’s cooperation to attain valued outcomes or resources)” (Simpson, 2007, p.264). The interpersonal approach to trust has demonstrated that the development of trust involves reducing the sense of uncertainty as partners move from the belief in the predictability of the partner’s behavior towards the conviction of his commitment “to the relationship and benevolent intentions and motives” (Simpson, 2007, p.265).

In the article (Cox, Kerschbamer, & Neururer, 2016) was written that “trustworthiness is frequently used, but without explicit definition; trust and trustworthiness are typically defined in terms of behavior in specific games” (Cox et al., p.198).

What about gender differences? Differences in trust and trustworthiness between men and women were demonstrated in research (Buchan et al., 2008). Former appeared more trusting other people while latter appeared more trustworthy in trust-games.

1.2. How is trust formed?

Based on a review of the interpersonal trust literature (Simpson, 2007) stood out four core principles of interpersonal trust formation.

- Firstly, people assess the degree to which they can trust their partners by observing whether a change in motivation occurs in trust-diagnostic situations. Trust diagnostic situations are such cases where participants make choices between their own personal self-interest and maintain the best interests of the individual or the relationship.
- Secondly, trust-diagnostic situations often arise spontaneously in everyday life, although they can be intentionally created or transformed to test, whether the current level of trust in a partner is correct.
- Thirdly, individual characteristics, such as attachment working models, self-esteem and self-concept influence the level of trust in a relationship. Those who have a secure type of attachment, high self-esteem and a differentiated self-concept are more inclined to trust people.
- Fourthly, the level of trust can be fully understood only if the dispositions of both partners are taken into account.

1.3. How is trust studied?

To measure trust, researchers conduct experiments in which people play games for money, such as the trust game, the ultimatum game, and the prisoner’s dilemma (Camerer & Fehr, 2004; Guzmán, Harrison, Abarca, & Villena, 2013), but the trust game designed by (Berg et al., 1995) is dominating in the field (Johnson, & Mislin, 2011). It can be employed to examine trust and reciprocity in experiments run in China, Japan, Korea, and the United States (Buchan, 2000) for purposes of both economic psychology and behavioral economics (Ashraf, Bohnet, & Piankov, 2006).

In the trust game two players, the sender (trustor, Player A) and the responder (trustee, Player B) are each given an endowment. Game usually includes two rounds. First: the sender is told she can send some, all, or none of her endowment to her anonymous partner, the responder. Any money sent is tripled. Second: the responder chooses how much of his total wealth (his endowment plus the tripled money) to return to the sender. Any money the responder does not return is his to keep. The unique subgame perfect Nash equilibrium for this game is for the responder to return no money, and thus for the sender to send none (Buchan, 2000). Money sent by sender, reflects level of his trust, money sent by responder reflects his level of trustworthiness. Besides two rounds game, it could be repeated investment game with more rounds (Boero, Bravo, Castellani, & Squazzoni, 2009; Bornhorst, Ichino, Schlag, & Winter, 2004; Bourgeois-Gironde & Corcos, 2011; Engle-Warnick & Slonim, 2006). It was shown that in the repeated game, player A (the “trustor”) sends more and player B (the «trustee») returns a larger percentage than in the one-shot game (Cochard, Nguyen-Van, & Willinger, 2004)

Johnson and Mislin (2011) conducted a meta-analysis of trust games (Berg et al., 1995) involving more than 23,000 participants. The goal was to identify the role of different aspects of design of the experiment and the effect of national peculiarities on trust and trustworthiness. Their findings indicate that concerning level of trust measured as the amount sent in the game two factor have significant influence: whether payment is random, and whether play is with a real person or with a simulated counterpart. Trustworthiness measured as the amount returned by the Receiver is significantly affected by three factors. First, how much the experimenter multiplies the amount sent. Second, if participants play both roles or perform only for a Receiver. Third, students send back significantly less money than non-student participants do. Discussing geographic differences, the robust evidence was found that there is lower level of trust in Africa than it is in North America (Johnson, & Mislin, 2011).

1.4. How does economic psychology explain a person's behavior during the game?

The behavior of the players in this case can be explained in terms of two main approaches: economic and psychological.

According to the economic approach, player A will not risk if he is not convinced that player B is trustworthy. Many studies confirm that trust is calculated on the basis of representations of trustworthiness. Trustworthiness, in turn, is a manifestation of reciprocity in response to trust (Camerer, 2003). In fact, if we assume that people view trust solely as a factor in making an investment decision under uncertainty, they will suffer losses (Ashraf et al., 2006). People continue to trust in “spite of the fact that they do not” (Guala, 2012, p.9) earn money on it, and they realize it even though they do not get a monetary reward for it. They like to trust and be kind to others, even if they remain anonymous.

From the psychological point of view, the player's behavior can be explained from the position of altruism (Andreoni, 1990), avoiding inequality (Bornhorst, Ichino, Schlag, & Winter, 2004) and the desire to be kind to others. Brühlhart and Usunier (2012) twisted the game: produced «rich» and «poor» player B by giving them different experimental endowments, and examined whether, consistent with dominant altruism, trustors gave more to the poor, or whether, consistent with dominant reciprocity motives, trustors gave no more to the poor than to the rich. Finally, they came to the conclusion that altruism is not a significant predictor of “trust-like” behavior.

2. Problem Statement

This article will consider one of the training options associated with obtaining a new experience – participation in a laboratory experiment that visually demonstrates the patterns of people's behavior under uncertainty. This laboratory experiment was conducted with students studied Economic psychology course at the Financial University. Theoretical aspects, procedure and results will be described below in more detail.

3. Research Questions

Several research questions were formulated.

1. Is there a gender difference in basic assumptions between men and women?
2. How are Trust Game actions and Basic assumptions interconnected?
3. What results can be obtained in Trust Game?
4. What results can be obtained in Basic assumptions?

4. Purpose of the Study

In this paper, we examined the possibility of applying Trust Game to study the trust and trustworthiness of the interaction partners in educational process and how trust and trustworthiness are related to basic assumptions of students.

5. Research Methods

In this study, we applied the experimental method and the correlation study

5.1. Sample

Participants were students enrolled in undergraduate and postgraduate courses in Personnel Management and Psychology Department of Financial University under the Government of the Russian Federation. They received extra credit for their participation according to results of Trust Game (to make participation significant). A total of 78 individuals aged from 17 to 36 years finally took part in the experiment.

5.2. Trust game

The procedure for the trust game was designed as a computer program. Students were divided into two groups and positioned in different rooms and given written instruction.

On their personal computers, students open Microsoft Excel file according personal digital code (in one class – starts with an even number, in another – with an odd number), these files are located in a network folder. Initially all the respondents perform as Player A and make decision how much from their balance they want to send to Player B. Money is deducted from their initial balance, tripled and added to balance of player B. After completing the protocols for Player A, students close their file and open the file of student from the other room according to a certain scheme. They take part in the experiment for Player B, deciding how much they want to send back to unknown Player A. Then, they open their initial file and complete Basic assumption questionnaire and socio–demographic data.

5.3. Basic assumption questionnaire

In (Janoff-Bulman, 1989) version of the World Assumption Scale (WAS) is frequently used to assess assumptions. It contained 32 items divided into 8 subscales (Randomness, Justice, Controllability of the World, Benevolence of People, Benevolence of the Impersonal World, Self-Worth, Self-Control, and Luck) to address each aspect of the assumptive world elaborated in her theory. In our research we used Basic Assumption Questionnaire adapted for Russian samples (Padun & Kotelnikova, 2008). It contains 37 items divided into 3 domains which split into 5 subscales. The items are measured on a 6–point Likert scale (from 1 – “strongly disagree” to 6 – “strongly agree”).

The first domain is the basic assumption about the benevolence of the world is represented by only subscale “The benevolence of the world” reflecting the individual's beliefs about the safety and possibility to trust the world around him. Low score reflects beliefs that people and world around are not benevolent and trustworthy.

The second domain is basic assumption about the justice of the surrounding world characterizes the individual's convictions about the principles of distribution of good and bad events and possibility to control own life. It contains two subscales: “Justice” and “Controllability”. Low score reflects beliefs that bad events are not distributed according to justice principles (justice), and events in the world cannot be controlled by people’s behaviors (controllability).

The third domain is basic assumption about worthiness and significance of self. It includes two subscales: “Self-worth” and “Luck”. Low score reflects beliefs that one is not a worthy or virtuous person (self-worth) and one is not lucky (Luck).

6. Findings

In this part of the article will be described results of the study and their discussion.

6.1. Results of the study and their discussion

Some protocols were excluded from the analysis because they were submitted empty or filled partially). In the analysis of the results, descriptive statistics methods (M, Med, Mode, Min, Max, SD), Spearman rank correlation coefficient, statistical criterion (Mann–Whitney U–test) were applied.

6.2. Trust Game results

Table 1 presents the descriptive statistics of the results of Trust Game in the general sample (N = 70).

Table 01. Trust Game descriptive statistics (N = 70)

	M	Med	Mode	Min	Max	SD
Part, Player A	0,40	0,30	0,20	0,0	1,0	0,29
Part, Player B	0,39	0,30	0,30	0,0	1,1	0,30
Total amount at the end, Player A	136,7	126,0	126,0	0,0	300,0	62,7
Total amount at the end, Player B	134,7	126,5	0,0	0,0	360,0	81,0

Note: M – Mean, Med – Median, Min – minimum, Max – maximum, SD – standart deviation.

First, we analyzed levels of trust and trustworthiness of our participants. From review above we conclude that trust is the readiness of respondents to give part of their funds in the hope that the second player will return part of their (Player A position). In this study, there were respondents who did not give anything (value «0») or gave everything (meaning «1»). The median value is 0.3.

Trustworthiness – the willingness to give part of its funds “gratis”, after receiving funds from a partner (the position of Player B) – has about the same characteristics. There were also cases when respondents were willing to give more than they have.

In addition, it was found that the average amounts won in both positions are also approximately the same (they do not differ significantly, Mann–Whitney U–test). At the same time, a common value in the position of Player A is the win «0», which corresponds to an altruistic strategy – to give all of its funds to an anonymous partner. Previous research results also confirm that in the situation of the experimental game people are more inclined to show altruism in relation to this partner. This may be due to the belief that cooperation is a more useful form of interaction both with respect to oneself and towards a partner (Hertwig, Hoffrage, and ABC Research Group, 2012).

6.3. Basic assumptions results

Table 1 presents the descriptive statistics of the results of Basic assumptions in the general sample (N = 70)

Table 02. Basic assumptions descriptive statistics (N = 70)

	M	Med	Mode	Min	Max	SD
The benevolence of the world	5,6	6,0	6,0	1,0	9,0	2,0
Justice	5,96	6,0	–	1,0	10,0	2,0
Self–worth	8,4	9,0	10,0	2,0	10,0	2,2
Luck	8,4	9,0	10,0	1,0	10,0	2,2
Controllability	7,5	8,0	10,0	2,0	10,0	2,2

Note: M – Mean, Med – Median, Min – minimum, Max – maximum, SD – standard deviation.

The basic belief about Benevolence of the world (M = 5,6, SD–2,0) and Justice (M = 5,96, SD–2,0) of the world are reflections of the individual's belief in the safe possibility to trust the world around him. Results in most cases were in the range of mean values. Previous studies of basic assumptions have demonstrated that deviation from mean values is more typical of situations that are rare in people's lives (for example, high levels of stress and PTSD, high level of anxiety. Our results demonstrate that students have normal beliefs without negative symptoms (Zukerman & Korn, 2014; Grills-Tauechel, Littleton, & Axsom, 2011; Ter Heide, Sleijpen, & Niels, 2017).

We received high score in basic beliefs “self–worth”, “luck” and “controllability”, that means respondents have positive view of themselves as lucky and valuable persons and life events as like controllable. The results are in agreement with the meta–analysis (Landau, Kay, & Whitson, 2015) according which people are motivated to perceive themselves as having control over their lives and respond to events and cognitions that reduce control with compensatory strategies for restoring perceived control to

baseline levels. Individuals have a basic need to perceive the world as orderly and structured. To satisfy this need they use personal and external sources of control (Friesen, Kay, Eibach, & Galinsky, 2014).

6.4. Gender differences in Trust Game and basic assumptions

To identify gender differences the sample was divided into two subsamples: men (N = 29) and women (N = 40) and Mann–Whitney statistics were employed.

Men and women are not significantly different in terms of trust and trustworthiness. Results are in agreement with recent meta–analysis related to the study of the behavior of men and women in such games revealed that there is no difference between their behavior in such games (Rand, 2017). Both men and women are equally inclined to show trust and trustworthiness. Perhaps this result is due to the influence of the so–called «social heuristics hypothesis» according to which people tend to choose a cooperative strategy of behavior to a large extent, based on the assumption that the other partner will also choose this strategy of behavior (Rand, 2017) and such ideas about the partner are typical for both men and women.

Although another study showed that in the Investment Game “men trust more than women, and women are more trustworthy than men” (Buchan et al., 2008, p.466). The correlation “between expected return and trusting behavior is stronger for men than for women, because men tend to view the interaction more strategically than women” (Buchan et al., p.466). Higher trust among men can be explained by their expectation to receive more in return.

We found significant differences in Basic Assumptions Questionnaire subscales. Men have lower values on the scale “Benevolence of the world” ($U = 406.5, p < 0.05$) and “Self–worth” ($U = 393.5; p < 0.05$), compared with women. The obtained data correlate with the results of studies, according to which women demonstrate a more positive attitude to the world around and are ready to help others, i.e. to a greater extent demonstrate prosocial behavior

Soutschek et al. (2017) provided a neurobiological account for why women often behave more prosocially than men: the neural reward system appeared to be more sensitive to prosocial rewards in women than in men. Some researchers explain the results from the standpoint of evolutionary psychology. On the other hand, low score on «Self–worth» scale can be interpreted rather inconsistently. In modern studies, psychologists increasingly come to the conclusion that students' self–esteem does not depend on his gender identity (Arens & Hasselhorn, 2014; Muthuri & Arasa, 2017). Most likely the result can be explained by the influence of cultural–specific factors: in Russian culture, men have a more expressed gender stereotype about their attitude to their own appearance. Most men share it and are extremely hostile to those men who depart from this stereotype.

6.5. Trust Game actions and Basic assumptions

To reveal the connection of the level of trust and trustworthiness in Trust Game (share of funds given in the positions “Player A” and “Player B”) with the subscales of Basic Assumptions Questionnaire, a correlation analysis (Spearman correlation coefficient) was carried out.

Significant positive correlations were found between the level of trust and basic beliefs “Benevolence of the world” ($r = 0.33, p < 0.05$) and “Luck” ($r = 0.4, p < 0.05$). That is, the more the subject is convinced that world is a friendly and safe place to live, the stronger his idea of himself as a valuable and successful person, the more funds he is ready to give to his anonymous interaction partner in the position

of “Player A” in Trust Game. These results are in agreement with (Costa-Gomes, Huck, & Weizsäcker, 2014) proved that there is a causal link between first-order beliefs and actions in an investment/trust game.

In our research the level of trustworthiness does not give significant correlations with the basic assumptions.

We found significant correlation between trust and trustworthiness ($r = 0.24$, $p < 0.05$). That is high willingness to trust people and share funds in position of Player A positively connected with willingness to reciprocate and share funds back in position of Player B. In other research it was also showed that there is a link between reliability and trust that has been identified in relation to these concepts in different social groups (child soldiers (Trussell, 2018), on social networks (Riyanto & Jonathan, 2018), etc. Relationship between trust and trustworthiness found in our sample is similar to those found in (Cox, & Orman, 2015) there the connection found only for the participants with strong social ties among themselves. This factor, based on the results of the conducted studies, plays a significant role in the interaction of trustworthiness and trust.

7. Conclusion

The conducted game experiment demonstrated the possibility of using Trust Game in the educational process for Russian students as an innovative technology in the teaching psychological courses in Financial University.

Trust is an important factor for all financial bargains because they involve the risk of losing valuable resources. The participants will not risk if they are not convinced that their partners are trustworthy. The manifestation of reciprocity in response to trust is trustworthiness.

People tend to trust more if they are convinced that their partner is aimed at interaction, has positive intentions and motivation. The willingness to trust is conditioned not only by the desire to gain material benefits, but also by the positive nature of people, by the desire to be kind to others and to behave altruistically, even in conditions of anonymous interaction.

A greater willingness to trust another in an anonymous interaction is associated with a higher appreciation of the world around as a benevolent and reliable, and oneself as a lucky person, and be a reliable (trustworthy) partner in financial interactions.

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