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Examining the Risk Behaviors of Individuals with Ultimatum Game within the Framework of House Money Effect[1]

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Abstract

The aim of this study is to find out the behavior of the economic individual from the assumption of rationality accepted in the standard economic theories and tend to show that the behavior of the individual is not completely rational and the cognitive capacity is limited. When the assumption of rationality which is the starting point of behavioral economics is questioned, the main aim is not to completely disagree with standard economic theories. On the contrary, it is aimed to support the standard economic theory with a more realistic prediction in the light of experimental methods.

Scope of the study, basic assumptions and concepts in mainstream economics and behavioral economics examined and compared. The basic issues in the psychological foundations of mainstream economics, the processes of behavioral and mainstream economics from the past to the present day, and the behavioral economics literature discussed in detail. Finally, the phenomenon of "House Money Effect" from mental accounting cases was experimentally analyzed with the help of ultimatum game. The purpose of the study is to examine the presence of house money effect by revealing individuals' different accounts in their minds and monitoring their attitude towards risk, and shows whether unexpectedly gained money leads individuals towards taking more risks or not.

Keywords: Behavioral Economics, Ultimatum Game, House Money Effect

JEL Code: C90, D91, D90.

[1] This study is derived from the Master thesis titled "Experimental analysis of risk behavior of decision makers in the context of behavioral economics" presented to Erzurum Technical University Social Sciences Institute in 2017.

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1. Introduction

The science of economics have existed with a philosophy founded on certain assumptions for years. Although these assumptions have been criticized from time to time, courses on economics are being taught in parallel to these assumptions.

The strongest assumption in economics that's been protected throughout the years is rationalisation. This is accepted by the majority of economics circles in which individual and societal decisions are made within a rational framework. Rationalisation is a tool identifying the philosophy of homoeconomicus, called a rationalist, that isolates individuals from real behaviors, and makes society a uniform decision maker. While an individual in economics is rational, he/she is knowledegable with strong comprehension, and has the skills to access the information when desired. These characteristics stem from rationality. Thus, the complex structure that individuals will face and the cognitive processes are excluded constantly in economics. Beyond complex problems, even in risky and uncertain situations that are faced, individuals that are rationally assumed as economical individual make decisions according to decision theories and move away from real individual behaviors.

Due to the fact that economics is a social science, individuals' certain behaviors should be examined. Even during the years when the foundation of economics was laid, several psychological and social factors that individuals have were mentioned. Economics, developed with a mentality of a rationalist individual that acts with a utility-based approach and maximizes his benefits conflicts with situations faced in real life. In real life, it is seen that an individual is not that rationalist and leans towards irrationalism due to several social and cultural factors. In recent century, the questioning of this irrationality is being addressed again with the identification of the fact that individuals may deviate from rationalism. Previously excluded sciences such as psychology and sociology have acquired a new dimension in behavioral economics to make assumptioms more realistic.

With Herbert Simon's questioning of rationalism and introduction of limited rationality, and the development of Prospect Theory of Daniel Kahneman and Amor Tversky, and the approaches of decision making under uncertainty and risk as well as the increase in behavioral economics studies in the near century, the foundation of behavioral economics was solidified. Micro-based studies in behavioral economics progress in a structure that aims to turn into policies. In today's global world where uncertainties and complexities increase, behavioral policies try to lead societies and many countries make decisions within the circle of behavioral studies.

2. Historical Overview of Behavioral Economics

The "behavioral economics" terms was first used by Johnson (1958) and Boulding (1958). At first sight, behavioral economics can be considered as association of behavioralism in psychology and economics. However, the foundation of behavioral economics rests upon cognitive psychology. As cognitive psychology emerged as a reaction to behavioral psychology, the effect of behavioral psychology on behavioral economics is weak (Angner and Loewenstein 2007)

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Many ideas and concepts in behavioral economics are not new. Concepts and ideas, in fact, are processes of things mentioned by economists classical and neo-classical economics transitioning to their core. For example, Smith's "The Theory of Moral Sentiments," Edgeworth's "Box Diagram" mentioned psychological approaches in economics. In addition to these, the delay in psychology becoming a science contributed to the delay of behavioral economics to be named as a scientific field.

The progress of psychology as a science was in parallel to continuous development of economics. In the second half of the 20th century, economists like George Katona, Harvey Leibenstein, Tibor Scitovsky and Herbert Simon wrote articles and books emphasizing the importance of the possibility of psychological measurements and rationalty being limited. While these articles and books drew the attention of many economists of the period, they did not help changing the fundamental principles an assumptions of economics. Several coincidental developments contributed to the development behavioral economics. The most important and the most commonly discussed of these developments is the acceptance of the utility models of expected and reductive that refers to making decisions under uncertainty and intertemporal choice.

Economists who accepted anomalies in economics could not ignore the developments in psychology. With the acceptance of cognitive psychology in the beginning of 1960s, the human brain was defined as a tool processing information rather than considering it as a tool that responds as in behavioral psychology. This change allowed many psychologists to compare models used in economics such as decision making and problem solving to their own psychological models. Tversky and Kahneman, two important names in psychology, developed the Prospect Theory based on their article published in 1974 in Science which discussed cognitive shortcuts and showed statistical deviations, and their 1979 article "Prospect Theory: Decision Making Under Risk" in which they discussed the deviations seen in the expected utility model. Their latest publication in the journal of "Econometrica" became one of the most cited articles (Camerer and Loewenstein 2004).

Economists such as Katona, Liebenstein, Scitovsky and Simon are considered as the pioneers of the behavioral economics field or former behavioral economists. The first pioneer researcher in the field of behavioral economics, George Katona, advised economists to lean towards psychological factors in their analyses in his article, "Psychological Economics." Another economist in the field, Herbert Simon, in his publication "Administrive Behavior" focused on how organizations behave. Harvey Leibenstein introduced the "X Inefficiency" concept to the literature that describes the failures of organizations, consumers, and employees in maximizing profit or benefit (Can 2012).

One of the milestones of behavioral economics is the article of Simon written in 1955 titled "A Behavioral Model of Rational Choice." This article supports the need to change the homoeconomicus assumption in economics and

makes recommendations. According to Simon, rationalism does not include everyone. As everybody has their own capacity of information and comprehension, rationality would be limited. Departing from this thesis, Simon supported that individuals can be limited rationalists rather than complete rationalists. Additionally, Simon used the concept "satisfaction" rather than benefit maximisation (Can 2012)and (Demir 2013).

With the changes in economics and psychology, the two fields came close to each other. Economics, with former behavioral economists, and psychology with cognitive psychology became the shared component in the intersection of economics and psychology. Simon has contributed significantly in the foundation of behavioral economics(Sent 2004).

Behavioral economics is a field producing a more realistic approach by drawing attention to economical individual's limited cognitive skills and revealing the aspects that are different than mainstream economics assumptions(Hatipoğlu 2012).

To explain the mainstream economics assumptions and concepts more realistically in behavioral economics, it was emphasized that an individual is not completely rational, but on the contrary is limited rational who can show irrational behaviors often. On the other hand, an individual with asymmetrical information is mentioned rather than a fully equipped individual with complete information. Individuals reflect their behaviors within several heuristics or bias frames when making decisions. Additionally, individuals can consider the other party's benefit in some circumstances rather than maximizing their own benefits. In other words, an individual engaging in behaviors such as homoeconomicus with maximum benefits us far away from being realistic. Thus, mathematics has become a goal in economics, rather than a tool. In behavioral economics, models are built with an inductive approach and experimental methods are used frequently.

3. Games Used in Experiments

In experiments used in economics, games such as ultimatum, dictator and trust, are designed and used to observe individuals' certain decisions and behaviors.

The Ultimatum Game

This is a game in which two players negotiate how to share a certain amount of money between the two of them(Neyse 2011). How do we incorparate our emotions in economical analyses? The answer to this question can be explained with a simple ultimatum game. In the ultimatum game, there are two parties; proposer and responder. The proposer receives a certain amount of money. For example, the proposer receives $10. Then, the proposer is asked to make a proposal to the responder to share the $10 he has. Let's consider the proposal is made for the amount of X. The responder may accept or reject the proposal. If he accepts the X amount, the proposer would have an amount of $10-X. If the responder rejects, neither party would gain anything. Empirical studies show that proposal with lower amounts (amounts below the 20% of the actual amount) are frequently rejected.

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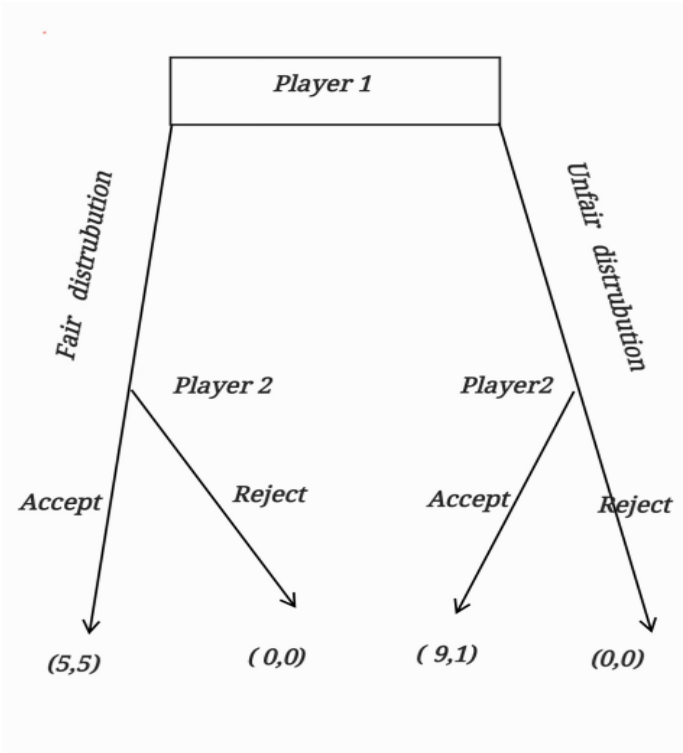
Generally, responders who respond with another proposal reacts emotionally. In other words, they are punishing the other party(Richard H. Thaler 2000).

Fig.1: Decision Options in the Ultimatum Game



According to rational decision theories, the first player is expected to make a low offer and the second player is expected to accept the low offer. The irrational results were surprising to economists (Powell 2003). Similarly, according to the assumption made by the standard game theory, the participants' only goal is to maximize self interest. For example, the responder should accept any offer higher than $0. It's better to get something than nothing. Despite these, in the majority of ultimatum games played with $10-15, the proposer gives 40% of the amount to ther other party. It was observed that the low offers were frequently rejected (Cameron 1999).

The ultimatum game, developed by Güth, Schmittberger and Scwarze in 1982 were played in different cultures and situations and the game design was changed depending on the research topic(Van Damme et al. 2014). Güth et al. who conducted two different experiments –"simple" and "complex" on the same amount. In their first experiment called "the simple game", requested participants to distribute a certain amount previously identified while in the "complex game" they asked participants to distribute black and white coins that corresponded to different amounts. The purpose of the second experiment was to see how complexity affected negotiation behavior (Akın and Urhan 2015).

- There are certain rules of the game (Neyse 2011):
- The player pairs do not know each other.
- They will not find out who their partners were after the game.
- Communication between players is banned.
- Players are fully informed about the game rules.

In the ultimatum game, the average acceptance amount differs according to factors such as age, racial and cultural differences, and gender which are different in multiple designs of the game (Demir 2013).

The Dictator Game

The two parties in the ultimatum game have two moves each. Considering a situation that the responder in the ultimatum game can't respond, then the game can be considered as a one-sided game. In the dictator game, there are two players but the second player does not have any moves and the first player is called the dictator player. Therefore, the game is called the dictator game. In a classical dictator game, the first player (dictator) shares the amount he's given with the other player. During this distribution, the player can either keep the whole amount to himself (100.0), or keep the bigger portion to himself (90.10), or give the whole amount to the other party (0.100). After the dictator distributes the amount, the game is over. If the distribution was done according to the Nash Equilibrium, the dictator player who is a rational economic individual, would be expected to keep the whole amount to himself in terms of the expectations of the economics theory. Because there is no move that the second player can make. The only choice is to accept the decision. Studies and experiments show that a certain positive amount can be given to the other party. Although the other player does not have a move, it is stated that the proposer makes the distribution with a altruistic approach. In fact, in the ultimatum game, behaviors of players in distributing the money, it is seen that not all the behaviors of players are strategic but also altruistic (Akın and Urhan 2015).

The Trust Game

Trust is a widely studied concept in interdisciplinary fields due to its importance in psychology, sociology and economics. With the developments in the science of economics, the concept of trust have played a significant role in understanding the decision units. The game of trust which is used in economics literature widely was studied by (Berg et al. 1995).

The first example of the trust game was first used by David Kreps in 1990. Krep's game is a theoretical model of a ranking game depending on fixed numbers. In this game of two there are two players; A and B and the first decision is made by the player A. Player A will choose either to trust player B or not to trust option. If player A does not trust player B, both players won't gain anything. However, if A trusts B, then it's B's turn to make a choice. If player B is loyal to player A, then both players will benefit fairly from the distribution. However, if a situation like betrayal occurs, then player B will receive an amount that is higher than A's. Also, player B has the option to not give the whole money (Demir 2013).

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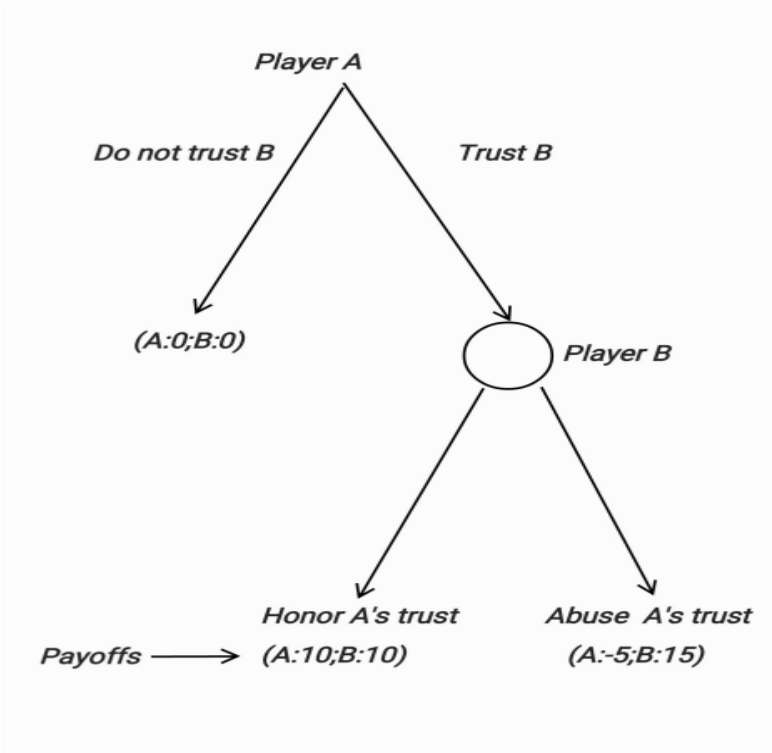
Fig. 2 The Trust Game of Kreps



While Kreps' trust game helps to understand if trust relationships are stable or unstable while the trust game of Berg et al., examines the effect of interpersonal trust when there is no continuous work relationship. Another contribution of Berg's trust game is that it creates a cluster of options that may help measure the degree of mutual trust. In experiments conducted particularly in a computer environment, players can choose the amounts decimally that they will send which gives researchers a scaling measurement.

4. Making Decisions Under Uncertainty and Perception of Risk

When problems related to making decisions under uncertainty are evaluated, we see that the approaches of all theories have assumptions on how the problem is presented. In the expected utility theory, the decision maker chooses the option that has the highest total value according to the values he attributes to an outcome or the benefit. According to the theory, all results are combined with the current wealth. The logic of the correction principle of the expected utility theory is as follows: Individuals add each possible result to the current amount they have and then the

decision is made according to the final amount level. When the decision is made in such way, how the problem is presented does not matter. Individuals would not be influenced by alternative presentations (Döm 2003)

In (Kahneman and Tversky 2013) Prospect Theory, options are adjusted before the evaluation of results. This adjustment in the Prospect Theory is done by framing the results as gains and losses according to the point of reference. While decision makers avoid risks in a situation of gain, they are in pursuit of risk in a situation of loss. The point that needs to be focused on in the theory is that decision makers perform an evaluation independent of previous results.

Richard H Thaler and Johnson (1990) supported Kahneman-Tversky's Prospect Theory with experimental studies they conducted and suggested inclusion of hedonistic framing principle. The order of hedonistic framing principle is as follows; distinction of gains, combination of losses, distinction of small gains from big losses, and combination of small losses with big gains. And the purpose of this principle is value maximization. Thaler & Johnson's proposal of framing principle is a different framing principle that is related to how decision makers frame problems. Individuals adjust their offers in a way that satisfies them and this is called hedonistic adjustment. One other point of Thaler & Johnson differing from Prospect Theory is the thought that decision makers' previous loss and gains would influence their decisions(Döm 2003)

Laughhunn and Payne (1984) examined the effect of sunk cost and sunk gain under uncertainty. Richard H Thaler and Johnson (1990) investigated how individuals behave in situations of loss and gain to see their risk behaviors. They included 95 students in economics in a two-phase game played with real money to see the effect of risk behaviors. In the first phase, students are either given money or their money is taken. In the second phase, students were asked if they are going to play or not. The study yielded results supporting the house money effect, break even effect and snake bite effect/risk aversion effect(Bayar 2011). As the house money effect will be tested in this study's experimental phase, first break even effect and snake bite effects will be discussed.

Risk Aversion Effect

In a two-phase situation, the loss that's integrated with a previous losses would hurt more and thus individuals avoid this kind of offer.Richard H Thaler and Johnson (1990) state that individuals avoid risk generally after a financial damage.

According to the risk aversion effect which is also called as snake-bite effect, snakes generally do not bite humans but when it happens, humans tend to be more cautious. This effect can also change investment decisions. For example, a conservative investor can lean towards different stocks to increase his portfolio. In general, adding new stocks to a portfolio provides income in a long-term. However, if the stocks bought start to decrease unexpectedly, they experience a snake-bite effect and think about selling the stock with panic. Risk aversion effect leads an investor to avoid long-term stock market (Nofsinger 2001).

Break-even Effect

Individuals who lose do not always avoid risk. They work to gain at least as much as they lose. For example, subjects who lost a certain amount initially were asked how much they can bet, majority of the subjects responded "they can bet the amount they lost or would not bet at all." The results show that break-even effect is stronger than the snake-bite effect because individuals can take risks to reach break-even point to alleviate their previous loss (Nofsinger 2001).

House Money Effect

The break-even and snake-bite effect involves individuals' attitudes towards risk in a situation of previous loss. When the opposite situation is examined, in other words a situation of previous gain, how are individuals' attitudes towards risk? Studies have shown that individuals can take risks after a gain that they would not take in normal conditions.

According to the Prospect Theory, while individuals tend to avoid risks before obtaining a certain gain, they tend to search for risks in situations presented as loss. Individuals' attitude towards searching for risk more after obtaining a gain is called house money effect (Krishnamurti 2009).

House money effect was first introduced by Thaler and Johnson. This concept is similar to individuals' increased tendency towards risk after having a successful investment experience. This is similar to gamblers' tendency towards continuing betting with the house money. After a big win, gamblers do not see the money that's won as their own money. As they did not integrate the money that was unexpectedly received with the money they earned, they act like they are gambling with the casino's money. According to the hedonistic framing principle, a previous loss can increase risk avoidance: a loss that is followed by another would be more damaging, losses are not integrated with previous results. When considered from an opposite perspective; after a win, the damage of following losses can be 'cancelled' by the feeling of happiness brought by the win and individuals avoid risks less. Thus, the tendency to search for risks increase after previous gains. Therefore, individuals avoid less risks after gaining and more risks after losing.

Richard H Thaler and Johnson (1990) addressed individuals' attitudes towards risk by providing examples and the presence of the house money effect. For example, when in a casino in Las Vegas, you put in a quarter in a machine that you were passing by and suddenly you won $100. What will happen now? Is this money going to change the gambling behavior for the rest of the night? In a different situation in which you realize that a hundred dollars were stolen from your pocket before coming to the casino. What would your gambling behavior be? Or, is finding out that your stock value increased or decreased 1 point right before you entered the casino similar to one of the other examples? These examples show how our risk taking behaviors affected by the first gain or first loss.

As decisions are generally made with temporal isolation, explaining risk behaviors after the first gain or first loss would be too broad. Current options would

be mostly evaluated with the information of results and this kind of information can generally be a handicap. While individuals interested in economics and decision theories focus on marginal costs, actual decision makers generally are effected by sunk cost (Arkes and Blumer 1985). Thaler and Johnson examined the effects of previous losses and gains by being influenced by Laughhunn and Payne (1984) study of the effect of sunk cost.

The house money effect has the same effect for investors. When investors receive an unexpected gain from a stock, they can direct their portfolio towards stocks that involve more risks. This way, investors can disrupt the balance of their portfolios unintentionally and without examining the portfolio's risk balance. Losses experienced after risky investments done inadvertently would lead investors to regret more (Gazel 2013).

Literature Review of House Money Effect

There are different empirical findings on how losses and gains affect risk taking behavior and decision making. While some support house money effectRichard H Thaler and Johnson (1990), Battalio et al. (1990), Keasey and Moon (1996), Ackert et al. (2006) some do not support it Clark (2002).

According to Richard H Thaler and Johnson (1990), previous gains affect investors/individuals risk behaviors and decision makers. Even though individuals would not have a habit of tendency towards risk, they can tend towards risk after an unexpected gain.

Battalio et al. (1990) proved the presence of house money effect on money gained with the bet placed with the first gain both hypothethically and with experiments conducted with real money.

Keasey and Moon (1996) designed an experiment on decisions related to capital expenditures and examined whether house money effect influences firm decisions. While gains changed individual behaviors towards risk-taking, losses do not change behaviors towards risk-aversion.

Ackert et al. (2006) were the first researchers who studied the house money effect empirically in a market environment and examined whether there is house money effect or not in terms of 'asset pricing in a multiple period environment.' They obtained strong findings supporting the presence of the concept.

Clark (2002) could not find any findings related to house money effect in his study.

Brown et al. (2006) obtained empirical findings on the house money effect. In their study, they examined the data between individual and institutional investors who make transactions in the Australian stockmarket. In the study, they found that previous gains tend to eliminate following losses and investors who are aware of their losses show a risky attitude until they reach break even point.

Massa and Simonov (2005) conducted an empirical study to analyse psychological bias of individuals' behaviors of risk taking and keeping stocks in Sweden. According to annual data, as previous gains increase investors' risk taking

percentage, losses decrease risk taking percentage which supports the house money effect hypothesis. The results of the study were consistent with the findings of the study conducted by (Brown et al. 2006). In study, while risk aversion was seen as a short-term behavior, house money effect was presented as a long-term behavior model.

Locke & Mann (2002) focused on a sampling consisting of individuals who engage in forward transaction in Chicago Mercantile Exchange . The results showed that individuals with experience tend to show less risky behaviors following abnormal gains compared to individuals without experience.

Most of the studies support the existence of house money effect. Therefore, the hypothesis of our study should be supported in this direction. On the other hand, when we look at the studies in general, it is seen that the house money effect is mostly investigated in financial markets (Keasey & Moon(1996); Ackert et al. (2003); Brown et al. (2002) ; Massa & Simonov (2003); Locke & Mann(2002)). As the transaction volume in global financial markets is becoming increasingly important, it is equally important to examine this effect. On the other hand, considering the experiments with real money, our study has an important place in terms of literature.

5. Experimental Analysis of House Money Effect with the Ultimatum Game

The Purpose, Scope and Significant of Study

The purpose of the study is to examine the presence of house money effect by revealing individuals' different accounts in their minds and monitoring their attitude towards risk, and tend to show whether unexpectedly gained money leads individuals towards taking more risks or not. The study also aims to test if individuals deviate from rationality and suggest irrational behaviors which is suported by behavioral economics circles.

Methodology

The presence of house money effect concept was experimentally examined by using the ultimatum game which is a behavioral game. In the experiment, the means of offer percentages proposed by the winners were calculated according to two different designs. After calculating the percentage differences in compared offers, the statistical significance of differences were examined. As the obtained data did not have normal distribution, a Mann Whitney-U test -non-parametric test- was used to determine the statistical significance of the difference. For data analysis, SPSS 22.0 packet program was used.

Experiment Design

The experiment was developed similar to the study design of Carlsson et al (2013). Carlsson et al. (2013) designed an experiment by having 211 participants playing the two-phase dictator game. In the experiment using real money, some

participants won 50 yuan by completing a survey while some participants won 50 yuan unexpectedly. In the study, the dictator game was played both in a lab environment and in the field and the means of offer percentages were calculated. In the game, the opponent party is a charity organization and the experiment was conducted with university students. In the experiment, the percentages of offers were compared according to both experiment environments and how the money was gained.

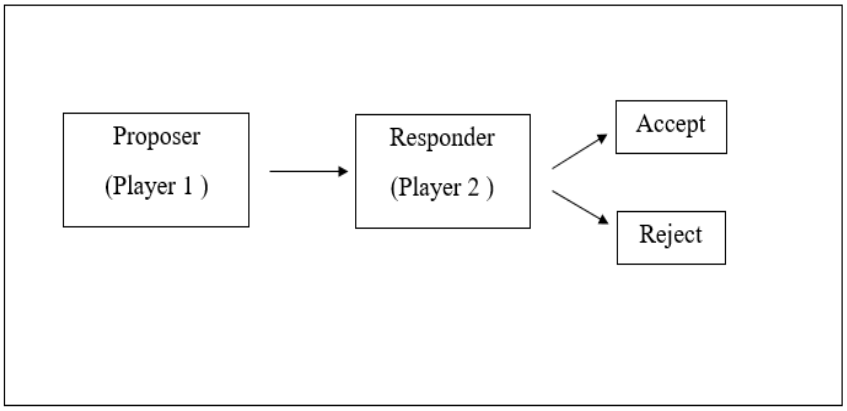
In the experiment of our study, real money was used and a two-scenario ultimatum game was designed. In the first scenario of the experiment, money was gained by putting time and effort while in the second scenario money was gained unexpectedly. Participants were selected from School of Economics and Administrative Sciences, School of Arts, School of Engineering, and School of Life Sciences. Within the scope of experiment scenario, half of the 290 participants were identified as proposers while the other half as responders. Participants of the game consisted of 4 groups: individuals who won money unexpectedly (Proposers 1), participants who earned money by putting time and effort (Proposers 2) and responders. Responder are not included in any secenario as they only effect the outcome of the game. 142 of 290 individuals participated in the ultimatom game with the money they won unexpectedly, 148 participated in the game with the money they earned.

The amount that students would earn in the experiment was determined as 30 TL. One of the most important factors in the ultimatum game that determines the amount of offer is the amount of money. The amount of money was determined in accordance with the average monthly income of undergraduate students in the city of Erzurum. Selcuk (2012) analyzed the expenditures of students at Ataturk Univeristy in Erzurum and found the amount to be 825 TL. Based on this amount, an average daily income of students which corresponds to 30 TL was determined as the amount for the game.

Experiment Scenario 1

The designed experiment aims to make participants play the ultimatum game by having them earn money in return for their time and efforts. Participants were randomly divided into two groups as proposers and responders. After establishing the groups, the participants in the proposers group were asked to complete a survey consisting of questions on analytical thinking and attention within the requested timeframe. After the surveys were collected, participants were told that they won 30 TL for their time and efforts. Then, these participants were asked to pay the ultimatum game with the money they just earned. After the first group played the ultimatom game, the offers proposed were conveyed to the responders group. When the offers were responded to, the experiment scenario was complete. Before the ultimatum game started, both groups were given written and oral explanations about the game and then each participant received forms related to offers to be used in the game. A shared form was used for one proposer and one responder.

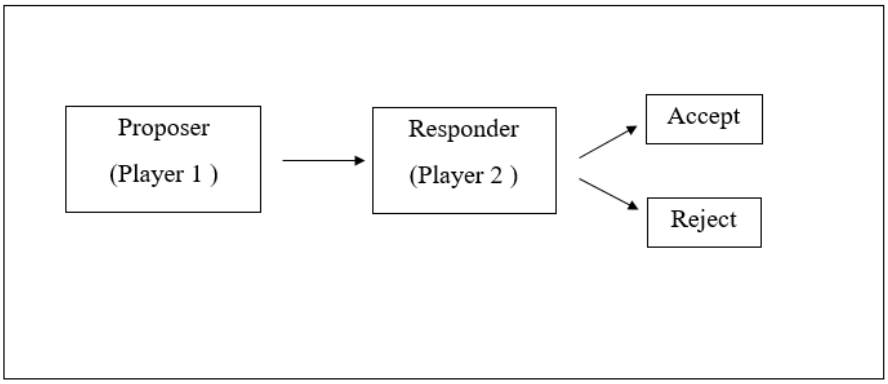
Fig. 3: Experiment Scenario 1: Money earned by time and effort



Experiment Scenario 2

This scenario was developed with the idea of participants winning money unexpectedly. Just like the first scenario, participants were divided into two groups randomly; proposers and responders. After dividing participants into groups, proposers were told that they were the lucky ones for the day and that they had won 30 TL. Proposers were then asked to play the ultimatom game with the money they just won. After the first round of the ultimatum game, the offers proposed were randomly conveyed to responders. After the responses collected, the experiment scenario was complete. Before the game started, both groups were provided written and oral explanations about the game and then each participant received forms related to offers to be used in the game. A shared form was used for one proposer and one responder.

Fig. 4 Experiment Scenario 2: Unexpectedly earned money



Results

The experiment was conducted with 290 undergraduate students at Erzurum Technical University. These participants were selected from School of Economics and Administrative Sciences, School of Arts, School of Engineering, and School of Life Sciences. Within the scope of experiment scenario, half of the 290 participants were identified as proposers while the other half as responders. In alignment with the purpose of the study, participants were divided into 2 fictional groups that are; those who won money unexpectedly and those who earned money for their time and effort. This distribution is presented in table 1.

Table 1 shows the distribution of students participated in the study.

Table 1. Participant Distribution According to Schools and Experiment Scenarios

	Participants who won money by their time and effort		**Participants who won money unexpectedly**		
School	**Proposers**	**Responder**	**Proposer**	**Responder**	**Total**
Economics and Administrative Sciences	22	22	22	22	88
Arts	15	15	17	17	64
Engineering	22	22	18	18	80
Life Sciences	15	15	14	14	58
Total	74	74	71	71	290

Source: Authors' calculations

Table 2 shows participant distribution based on gender. According to the experiment scenarios, there were 36 males and 38 females in the group that won money due to their time and effort while there were 36 males and 35 females in the group that won money unexpectedly.

Table 2. Participant distribution based on gender

		Gender		**Total**
		Male	**Female**	
Scenario	Participants earned money by their time and effort	36	38	74
	Participants won money unexpectedly	36	35	71
Total		72	73	145

Source: Authors' calculations

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Table 3. Acceptance and Rejection Rates based on Scenarios

			Acceptance or Rejection		Total
			Acceptance	**Rejection**	
Scenarios	Participants earned money by their time and effort	Participant number	63	11	74
		Percentage	85,1	14,9	100,0
	Participants won money unexpectedly	Participant number	55	16	71
		Percentage	77,5	22,5	100,0
Total		Participant number	118	27	145
		Percentage	81,4	18,6	100,0

Source: Authors' calculations

Table 3 shows the distribution of acceptance and rejection percentages within the experimental scenarios. To 74 proposals in the group with participants who earned money by working to earn the money, 63 participants said 'accept' and 11 said 'reject'. In the group with participants who won money unexpectedly, 55 accepted and 16 rejected the offers. When the acceptance rates of proposals were compared in each group, while 85.1% of the proposals of participants who earned money were accepted, 77.5% of proposals of those who won money unexpectedly were accepted. Similarly, when the rejection rates are evaluated, 14.9% of the proposals of those who earned money were rejected while 22.5% of those who won money unexpectedly were rejected.

Table 4. Average Amount that Participants Who Proposed According to the Experiment Scenarios Kept for Themselves

Scenarios	**Average Amount that Proposers Kept for Themselves**
Participants who earned money by putting in time and effort	15.756
Participants who won money unexpectedly	16.831
Total	16.282

Source: Authors' calculations

When the distribution of the money earned examined in table 4, participants who earned the money by putting time and effort for it kept 15.756 TL to themselves. Participants who won money unexpectedly kept 16.831 TL for themselves.

Tablo 5. Average Amount of Proposal Rate According to Experiment Scenario

Scenarios	**Proposal % Average**	**Std. Error**	**Variance**	**Std. Dev.**	**N**
Participants who earned money	0.4748	0.010	0.008	0.090	74
Participants who won money unexpectedly	0.439	0.0187	0.025	0.158	71
Total	0.4572	0.010	0.017	0.128	145

Source: Authors' calculations

Table 5 shows the average percentage of amount that was shared by the participants who won money with responders. The average of proposals show differences based on the way 30TL gained. 74 participants who earned money proposed an average of 47.48% of the earned money. 71 participants who won money unexpectedly proposed 43.9% of the money to the responder.

There are differences in the two scenario of the game. In order to find out if the differences are statistically significant, first the normal distribution of rate of proposals according to scenarios should be examined. The hypotheses to test the normality of proposal percentages:

Hypothesis for the first scenario (money earned by time and effort)

- H_0: The proposal percentages are normally distributed at the 5% significance level.
- H_1: The proposal percentages are not normally distributed at the 5% significance level.

Hypothesis for the second scenario (money won unexpectedly)

- H_0: The proposal percentages are normally distributed at the 5% significance level.
- H_1: The proposal percentages are not normally distributed at the 5% significance level.

Table 6. Normality Test of Proposal Ratios Based on the Scenarios

	Scenarios	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
Proposal Ratio	Money earned	0,448	74	0,000	0,546	74	0,000
	Money won unexpectedly	0,298	71	0,000	0,779	71	0,000

Source: Authors' calculations

Table 6 shows that normality test results of the proposal ratios. As both group's proposal ratios have a statistical value of smaller than 0.05, H_0 hypotheses are refuted (0.00<0.05) and therefore, the distribution is not normal.

As the proposal ratio variables did not show normal distributions, the significance of differences in proposal ratios were tested with Mann Whitney-U.

Hypothesis;

- H_0: There is not a significant difference between the distributions of scenario variables.
- H_1: There is a significant difference between the distributions of scenario variables.

Table 7. Mann-Whitney U statistics between scenario variables

	Score
Mann-Whitney U	2164,500
Wilcoxon W	4720,500
Z	-2,221
Asymp. Sig. (2-tailed)	,026

Source: Authors' calculations

Table 7 shows the results of the Mann Whitney U test. The results show that H_0 hypothesis is refuted at the 5% significance level (0,026 < 0,05). These results show that there is a significant difference between the scenarios variables' distributions.

Table 8. Proposal Ratio Average Distributions of Scenarios based on Gender

Scenarios	Gender	Proposal % Average	Std. Error	Variance	Std. Dev.	N
Money earned	Male	0,475	0,011	0,005	0,070	36
	Female	0,474	0,017	0,011	0,106	38
	Total	0,474	0,010	0,008	0,090	74
Money won	Male	0,452	0,031	0,036	0,188	36
	Female	0,424	0,020	0,014	0,120	35
	Total	0,439	0,018	0,025	0,158	71
Total	Male	0,463	0,016	0,020	0,141	72
	Female	0,450	0,013	0,013	0,115	73
	Total	0,457	0,010	0,017	0,128	145

Source: Authors' calculations

Table 8 shows the gender distribution of proposal ratio averages according to experiment scenarios. Males offered 47.5% of the money they earned while males who won the money unexpectedly offered 45.28%. Females who earned the money offered 47.4% of the amount while those who won the money unexpectedly offered 42.4% of the amount.

There is a difference between males and females in the averages of proposed amount of money. To find out if the difference is statistically significant, first their normal distribution needs to be examined. As the statistical values of both scenarios are less than 0.05, H0 hypotheses are refuted (0,00<0,05) and therefore, they don't show normal distributions.

The significance of differences in proposal ratios based on scenario is shown with a Mann Whitney U-test.

Table 9. Mann Whitney U-Test Results of Males in Scenario Variables

	Score
Mann-Whitney U	575,000
Wilcoxon W	1241,000
Z	-0,968
Asymp. Sig. (2-tailed)	0,333

Source: Authors' calculations

Table 9 shows that the H_0 hypothesis is supported at the 5% significance level (0,333 > 0,05). This shows that there is no statistical significance between the scenarios variables' distributions.

The proposal ratio variables of females did not show normal distribution (0,00<0,05). Therefore, a Mann Whitney U-test was completed to show the statistical significance.

Table 10. Mann Whitney U-Test Results for Females in Proposal Ratio Variables

	Proposal ratio
Mann-Whitney U	506,000
Wilcoxon W	1136,000
Z	-2,209
Asymp. Sig. (2-tailed)	0,027

Source: Authors' calculations

Table 10 shows that the Ho hypothesis is refuted at the 5% significance level which indicates a statistically significant difference between the scenario variable distributions.

Table 11 shows the mean scores for proposal amount ratios at the school level based on the scenarios. In terms of scenarios, the proposal ratios of those who earned the money in the schools of economics, arts, engineering, and life sciences are %47.5 , %48.8, %47.7 and %45.5 respectively. The ratios for those who won the money unexpectedly are %45.9, %40.9, %49.2 and %37.3 respectively. The mean scores for proposal ratios of the money earned are surprisingly higher than the amount proposed in all the schools except for engineering. Schools of art and life sciences are the ones in which the average proposal ratios are significantly different.

Table 11. Mean Scores for Proposal Ratios based on the Faculties

Scenarios	**School**	**Proposal % Mean**	**Std. Error**	**Variance**	**Std. Dev.**	**N**
Those who earned money	Economics	0,475	0,027	0,017	0,129	22
	Art	0,488	0,011	0,002	0,043	15
	Engineering	0,477	0,016	0,006	0,076	22
	Life Sciences	0,455	0,019	0,006	0,076	15
	Total	**0,474**	**0,010**	**0,008**	**0,090**	**74**
Those who won money unexpectedly	Economics	0,459	0,020	0,010	0,098	22
	Arts	0,409	0,041	0,029	0,169	17
	Engineering	0,492	0,049	0,044	0,209	18
	Life Sciences	0,373	0,033	0,016	0,126	14
	Total	**0,439**	**0,018**	**0,025**	**0,158**	**71**
Total	Economics	0,467	0,017	0,013	0,114	44
	Arts	0,446	0,023	0,017	0,131	32
	Engineering	0,484	0,023	0,022	0,149	40
	Life Sciences	0,416	0,020	0,012	0,110	29
	Total	**0,457**	**0,010**	**0,017**	**0,128**	**145**

Source: Authors' calculations

There is a difference in the proposed amount averages between the schools. First a normality test was completed to see if the difference is significant. Both scenarios did not show normal distributions of proposed amounts in all schools.

Table 12. Mann Whitney U-Test Results for Schools

	Asymp. Sig. (2-tailed)
Economics and Administrative Sciences	0,299
Arts	0,220
Engineering	0,590
Life Sciences	0,590

Source: Authors' calculations

Table 12 shows the Mann Whitney U test results for schools. There was not a statistically significant difference in scenarios variable distributions for schools at the 5% significance level.

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6. Discussion

This part highlights the principle idea that underlies our proposed framework. This study contributes clear support for the theory and precedent experimental results on the house money effect.

The use of real money in the study has an important and unique place in terms of the scenario used in the context of behavioral economics experiments in Turkey.
In addition, it contributes to the literature in terms of applying the risks taken to students in different fields. However, the fact that the study was conducted under weak control conditions of the experimental environment shows the deficient of the study. It is foreseen that our next study will contribute more to the field of behavioral economics by providing a stronger control in the lab experiment.

On the other hand, our study does not strictly reject rationality; however, it proposes to show that the individual actually has limited cognitive capacity. Taking the money earned by individuals unexpectedly without effort into account in terms of public policy will lead the micro dimension of our work to reach macro targets. For example, policy-oriented work can be done in terms of transferring promotional payments given by banks to appropriate spending channels in Turkey.

7. Conclusion

The study revealed the differences between mainstream economics and behavioral economics and suggested that individuals with irrational, limited cognitive skills and asymmetrical information tend to show more realistic behaviors.

In the study in which the difference in attitudes towards risk in individuals open different accounts in their minds while making decisions in risky situations is shown, an experiment was conducted to show House Money Effect. Individuals' perception of the money they win unexpectedly is different than those who worked for the money as they record the unexpected money in a different account in their minds. According to the House Money Effect, an individual is highly expected to risk the money they win unexpectedly. The ultimatum game resulted in findings supporting the House Money Effect.

There were differences in the proposal amounts depending on how the money was gained: According to the game scenarios, participants who earned the money offered 47.4% of the earned amount and those who won the money unexpectedly offered 43.9% of the money to the other player. Due to the game rules, considering the rejection risk, participants who won money unexpectedly saved more money for themselves and took more risks than those who earned the money.

Statistical tests showed significant difference between scenarios in proposal averages. Thus, there was a House Money Effect in the experiment. Additionally, when the acceptance and rejection rates are examined, in the game scenario that participants earned money, the percentage is 14.9% while in the other scenario it is 22.5%. This shows the risk between the scenarios

When the average proposal amounts are evaluated based on gender, males who earned money offered 47.5% while those who unexpectedly won money offered 45.2%. Similarly, females who earned money offered 47.4% of their money while those who unexpectedly won money offered 42.4%. the average of proposal amounts of both females and males support the House Money Effect. However, there was a significant difference between the proposal amounts only in female students.

When the proposal ratios are evaluated according to the schools, the results of all the schools except for engineering supported the House Money Effect. The average proposal amount of students who unexpectedly won money in the school of engineering was 49.2% while the same ratio was 47.7% for those who earned money. This shows that participants in the engineering school who earned money engaged in search for risk. However, no statistical significance was found between the schools in averages.

The results of the ultimatum experiment suggest that individuals are not seen rational, who think about their interests as assumed by the standard economics theory, but on the contrary, they are seen as individuals who also think about others' interests. If it was the way assumed by the standard economics theory, individuals would think about their own interests and save more money to themselves. Responders would accept all the amounts except for zero because according to standard economics theory, individuals only think about their own interests.

When the reasons for individuals' risk behaviors are examined and necessary outputs are obtained, then the approach of micro-based behavioral economics can be directed towards policy-based behavioral economics approach. Therefore, when the amounts earned unexpectedly are defined, the risk directions can be estimated and more consistent decisions can be made.

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