

## Gender Differences of Young People's Altruistic Behaviors: A Public Goods Game Experiment

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Kıymet Yavuzaslan\*

\*Dr. Öğr. Üyesi, Aydın Adnan Menderes Üniversitesi, Aydın İktisat Fakültesi, Aydın / Türkiye  
E-Posta: [kiymet.yavuzaslan@adu.edu.edu.tr](mailto:kiymet.yavuzaslan@adu.edu.edu.tr) ORCID: [0000-0002-3016-3084](https://orcid.org/0000-0002-3016-3084)

### Abstract

*Altruism, a social fact described as a human-specific behavior which assumes observing others' interest as much as personal utility or self-sacrifice has recently come to forward as a sensitive subject that deserves investigation due to expanding technological-based socialization among the young generation. The present study- oriented on the altruistic attitude of young people within the framework of experimental economics and a survey method contained public goods game was applied to measure altruistic behavior. Public goods game is based on the judgement of participators regarding how much money they could donate to a fund that would be shared equally among all participants. In economics science, rational and selfish individuals are expected to exhibit preferences both to keep money in their hand and the amount that would come from the public pool. In the study survey, demographic and cultural characteristics of young people were investigated in terms of their role on young people's altruistic behaviors. It was revealed that gender and fathers' occupations were found to be statistically significant in young people's preferences. As a result of findings exhibited that personal characteristics of participant young people were effective on their tendency to show altruistic behavior accordingly on their economic preferences.*

**Keywords:** Behavioral Economics, Experimental Economics, Public Goods Game, Young People, Gender

## Gençlerin Diğerkâmlık Davranışında Cinsiyet Farklılıkları: Bir Kamu Malı Oyunu Deneyi

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### Öz

Başkalarının yararını da kendi yararı kadar gözetme yani fedakârlık olarak da nitelendirilebilecek insana özgü bir olgu olan diğerkâmlık davranışı, genç neslin teknolojik yeniliklerle birlikte giderek sosyalleştiği günümüz koşullarında araştırılması gereken hassas bir konu olmuştur. Gençlerin diğerkâmlık tutumunun, deneysel iktisat kapsamında incelenmesi bu çalışmanın ana hedefi olmuş ve diğerkâmlık davranışı ölçmek amacıyla kamu malı oyununun yer aldığı anket yöntemi uygulanmıştır. Kamu malı oyunu; daha sonra eşit şekilde paylaşılacak bir toplam meblağ için katılımcıların ellerindeki paranın ne kadarını vereceklerini tercih etmeleri üzerine kurulurken, ekonomi biliminde rasyonel davranan ve bencil olan bireylerin hem ellerindeki paraya, hem de ortak havuzdan gelecek olan tutara sahip olacak tercihlerde bulunması beklenir. Ankette, gençlerin demografik ve kültürel özelliklerinin diğerkâmlık davranışlarındaki rolü de ölçülmüştür. Katılımcıların cinsiyeti ve babalarının meslek durumunun, tercihlerinde istatistiki olarak anlamlı etkisi olduğu sonucuna ulaşılmıştır. Elde edilen bulgular; ankete katılan gençlerin bireysel özelliklerinin, diğerkâmlık davranış sergilemesinde ve dolayısıyla ekonomik tercihlerinde etkili olduğunu göstermiştir.

**Anahtar Kelimeler:** Davranışsal iktisat, Deneysel iktisat, Kamu Malı Oyunu, Gençler, Cinsiyet

## Introduction

Whereas Thomas Hobbes suggests that "inherited human nature is selfish and oriented on self-interest", Adam Smith, influent on emergence of economics, and leading economists of Jeremy Bentham and John Stuart Mill, architects of significant economics theories, acknowledge that self-interest and human selfishness are the fundamental motives determining both individual and social-economic utility (Miller and Kim, 1988). On the other hand, with the integration of selfishness into the economics theories personal affection, opinion or motives were recognized in the economics and thus, their analyses become possible. Contemporary circumstances required the inclusion of such humane motives into the economic analyses once again. Economic, social, political and cultural environment comprised of quantitative and qualitative characteristics of human beings play a significant role in developing innovation and creativity in an economy (Aykırı, 2017). When technological changes are taken into consideration, it could be appropriate to conclude that especially young people are the first social group diverting from decision-making process on the basis of "homo-economicus" concept. In terms of exposing effects of psychological processes on human behavior and preferences in a separated way (Vriend 1996), it is regarded that more extensive researches employing experimental economics are required in behavioral economics on the basis of irrational man description of economics. In these experimental studies, individual economic agents could be examined through a more realistic approach. According to this new approach, economic agents are selfish, on the other hand, they are regarded as social creatures because they interact with each other.

Altruism is a human-specific motive; however, it is usually disregarded by the economics. Although decisions are usually made within "rational action theory" in economics, the extensive economics literature has emerged which takes humane affections, opinions and behavior foundations into consideration. While numbers of studies are reported in this regard, it is possible to claim that a new streamline has emerged in this light. Successful results of analyses employing experimental studies and game theory have yield behavioral models increasingly recognized around the globe.

Since it is considered that technological novelties, especially social media technologies, have an impact on economic decisions of young people, in the present study there has been conducted a survey inspired from "public goods game", one of the game theory types, on university students. The study analyzed the effect of personal characteristics of students on altruistic decision-making process by analyzing their tendency to make a contribution into the common pool similar to the one in the "Public goods game" with respect to their demographic and family characteristics.

In the literature review altruism concept is explained from the behavioral and experimental economics approach and the studies are revealed which are using public goods game to measure altruistic behaviors. Section 3 includes the methodology and related data; Section 4 provides the results of the findings to exhibit individual altruistic levels of participants. It was also possible to examine the determinants of altruistic motives of students participated in public goods game in the study. The final section exhibits the conclusion.

## **Literature Review**

Altruism refers a pro-social behavior motivated by a desire for prioritizing others' wellbeing instead of personal rewards (Batson 1988). Thus, (altruismé), the central concept of pro-social behaviors domain in the social psychology literature, was conceptualized as the opposite of selfishness (egoismé). The concept was first suggested as secular equivalence of religious charity (charité) phenomena by leading sociologist Augusto Comte. In this secular version, the fundamental pattern was the humanist ideal. It relies on a decrease of self-centered (egocentric) tendency of human beings and their approach to others. Altruism is sharing others' anxiety and striving to help them. At this point, the help concerned here for others does not assume any material or moral return in the exchange. Therefore, some authors claim that altruism requires individuals to commit self-sacrifice and assumes to show behaviors against the interests of a person (Brief and Motowidlo, 1986).

Moscovici (1972), who laid the foundation of the altruistic behavior mostly referred in connection with helping behavior, suggests three

types of altruism. According to Moscovici (1972), the first type altruism group is comprised of relativity relationship (family, clan, sect, nation, home country); the second includes confidence-based altruism developed within inter-personal cooperation relationship; the third is normative altruism that relies on services of social institutions (social insurance, retirement pension, unemployment office, etc.).

A most individual recalls using certain principles or criterions used by a mechanism for sharing objects when they hear the concept of "distribution". Some errors could have been infiltrated into the distribution process of shares. There is no central distribution system in which control of all resources is nested within a certain person or group or in which distribution of resources is commonly determined. In a free society, various persons control different resources and new gaining is earned as a result of activities of individuals based on voluntary exchanges. The total result is the product of individual decisions of many parties related to the subject (Nozick, 1974). While doing so, they are required to be motivated by altruism affections or to dislike unequal sharing of gaining (Offerman 1997). Subjects on whether ontological existence of human beings is selfish or altruistic, and whether such qualities of human beings are hereditary or caused by environmental factors have been investigated by philosophy since ancient ages; by psychology after 19th century; and now by economics.

Behavioral economics has shown that personal characteristics such as expectation, affection and altruism were effective on economic decisions of human beings, which contain risk not only clear and material factors as suggested by determinism philosophy (Chowdhury and Jeon, 2014). In the behavioral economics literature, it is seen that game theory has been utilized to investigate the extent of the effect and pattern of altruism motive on economic decisions.

In the economic decision process, the possibility of others' decision to affect the results urges individuals to consider counterpart's decisions to take strategic action. While the Game Theory investigates individuals' behaviors in strategic circumstances in which reciprocal dependency exists, it allows creating systematic analysis conducted to determine the best possible course of action for individuals (Camerer, 2003). Types of games designed by the Game Theory exhibits difference, and measuring

personal (age, gender, education level etc.) or cultural characteristics of individuals are intimately related to the design of the game. The Ultimatum Game, one of these game types, is played between two groups one of which offers money and the other receives the offer. Dilek and Keskin (2018) designed an ultimatum game for participants divided into two groups; the first group is expected to make an imaginary money offer whereas the other group exhibit their decision against this offer either accept or reject it. In case of rejection of the offered amount, both participant groups win nothing. In the conducted experiment, it was seen that participant exhibited consent to share 33.06% of their possessions; and that participants rejected most of the offered amounts which they consider unfair. These results showed that participant young people rejected the money offered if sharing was unfair at the expense of no gaining.

Another game type frequently employed in the determination of whether individuals make altruistic preferences is the public goods game. All players in an experiment designed by a standard public goods game donate some of their existing money to a common pool. Also, it is declared to the participants that the amount gathered in this pool would be shared equally among the players at the end of the game. A different version of this game could be designed, in which couple of times of the accumulated amount would be shared among all participants. Thus, on the contrary to economics, it was aimed to generate economics models (behavioral economics) including rational and non-selfish decisions by investigating into the nature of non-selfish preferences (Camerer, 2003; Brañas-Garza and Espinosa, 2011).

Since the public goods game has dominant strategies, it is simple; and participants are expected to make zero contribution into the common pool in a game if they act rationally. Moreover, laboratory experiments in which public goods game was conducted indicate that subjects tend to follow up strategies making a donation more than assumed in the cases when the balance make zero contribution. And also, observed contribution level could vary. Even though participation level typically decreases over time, it was seen that as the amount paid to subjects at the beginning increases, their contribution to the common pool was seen to be increased as well. Thus, existence of significant volunteer contributions such public goods game is connected with a humane motive of altruism

behavior (Andreoni, 1988; Andreoni, 1989; Andreoni, 1993; Andreoni and Miller 1993; Lenyard, 1994; Anderson et al., 1998; Cason et al., 2002; Anderson et al., 2011;).

Offerman et al., (1996) showed in gradual public goods games that the effect of having greater funds available in subjects' hands on their donation to the common pool was positive; and this was considered as a sign of increasing altruism. Majority of studies on public goods game has been concentrated on altruism; and there was significant evidence regarding the form of altruism felt by subjects (Andreoni, 1993).

The assumption that there could be altruism motive underlying beneath the societies' exhibition of citizenship behavior for fulfilling certain needs allowed revealing the degree of personal differences of participants of the public goods game (Erikson and Strimling, 2014). In this scope, experimental studies conducted with the Game Theory investigate the role of citizenship on the supply of public goods. Henrich et al., (2005) studied fifteen countries with diverse characteristics in terms of economic and cultural conditions; and revealed remarkable and systematic differences in donation levels of societies in the public goods game experiment. Finally, the authors conducted one of the most substantial studies on the role of cultural differences on preferences.

Cason et al., (2002) reported significant differences in behaviors of Japanese and American subjects in the public goods game. Similarly, Cadsby et al., (2007) concluded as a result of the experiments utilized from the public goods game that there were significant differences between Canadian and Japanese subjects in terms of gender.

Herrmann et al., (2008) compared behaviors among 16 countries in the public goods game with a penalty option. In their study conducted over students from the US and Eastern European countries (Ukraine, Belarus and Russia), it was seen that Eastern Europeans showed a higher tendency for the public good in cases with no penalty option. Moreover, when the penalty option existed, Americans displayed more contribution than other national groups.

## Methodology

The sampling group is composed of 371 students from the Aydın Adnan Menderes University, Aydın Faculty of Economics. The first section in the surveys was designed to collect demographic characteristics of students, while the second section includes items structured based on the public goods game. As it was listed in the Literature Section, there were various versions of the public goods game. In this study, a basic public goods game setting was preferred. In the public goods game, all participants were asked how much of their available money they would like to donate to a common pool which would be equally shared at the end of the game. Accordingly, in the second section of the study, students were asked to assume that they have either 100 or 1,000 (Turkish Liras - ₺); and all amount collected in the common pool which would be accumulated with donations of all students would equally be shared among participant students.

## Findings

In the analysis of collected study data, the first general demographic characteristics of participant students were summarized in Table 1 below;

*Table 1. Demographic Characteristics*

Gender	Frequency	%
Female	199	53,6
Male	171	46,1
Age	Frequency	%
18	25	6,7
19	66	17,8
20	86	23,2
21	80	21,6
22	51	13,7
23	30	8,1
24	10	2,7
25	4	1,1
26+	10	2,7



According to the demographic data of the sampling group shown in Table 1, students' average age was found as 21. Since majority of participants were a student at a university, 23.2% of survey responders were 20 years old. The youngest and oldest students were 18 and 31 years old, respectively. In terms of gender distribution, 171 of participants were male (46.1%), while 199 were female students (53.6%).

Table 2 exhibits the students' answers to the survey items in the second section when they assume they have either 100 ₺ or 1,000 ₺. According to Table 2, when assumed to have 100 ₺ available, the average donation amount for the common pool was estimated at 24.31 ₺. By adopting rational consideration, 74 out of 371 participants preferred not to make any donation to the common pool which is equally shared among donors. On the other hand, when they assumed to have 1,000 ₺ available, the average donation to the pool was estimated at 175.92 ₺. The number of zero-donators decreased to 63.

According to the "rational action theory" (homo economicus), participants of the public goods game are expected not to make any donation from their available amount to the common pool that would equally be shared among participants at the end of the game so as to maximize their gaining. However, across the studies conducted based on the public goods game, the average donations of participants have never been "0" due to their limited rationality. Thus, it is possible to show that human beings do not make insensitive decisions like machines; and that human-specific motives like altruism could also be effective on economic preferences. Finally, studies conducted with the public goods game have suggested that participants display altruistic behaviors. Similarly, in this study, it is possible to conclude that our findings supported the existing literature on the public goods game.

*Table 2. Preferred Donation Amounts Made to Common Pool by the Participants when assumed to have 100 ₺ or 1.000 ₺*

<b>When The Participants Assume They Have 100 ₺</b>	<b>Frequency</b>	<b>%</b>
0	74	19,95
1	22	5,93
5	35	9,43
10	49	13,21
20	56	15,09
30	19	5,12
40	24	6,47
50	64	17,25
60	1	0,27
70	5	1,35
80	2	0,54
90	1	0,27
100	18	4,85

  

<b>When The Participants Assume They Have 1.000 ₺</b>	<b>Frequency</b>	<b>%</b>
0	63	17
1	12	3,2
5	12	3,2
10	26	7
20	10	2,7
30	3	0,8
40	3	0,8
50	51	13,7
60	2	0,5
70	5	1,3
80	3	0,8
90	1	0,3
100	57	15,4
200	32	8,6
300	15	4
400	12	3,2
500	44	11,9
600	3	0,8
800	1	0,3
1.000	15	4

**Table 3. Impact of Variables on Preferences (T-Test and ANOVA Test Results)**

Variables	100 ₺		1.000 ₺	
	F	Significance <sup>1</sup> (p)	F	Significance <sup>1</sup> (p)
Gender	2,586	0,002**	0,715	0,080**
Age	1,161	0,322	1,404	0,193
Father's Occupation	2,187	0,044**	2,735	0,013**
Mother's Occupation	1,863	0,075	1,761	0,094
Father's Education Level	1,416	0,218	1,906	0,093
Mother's Education Level	0,761	0,578	0,855	0,512
Having Younger Siblings	3,998	0,442	0,475	0,998
Having Older Siblings	2,07	0,177	0,376	0,48

<sup>1</sup> \*\*\*, \*\* and \* refer 1%, 5% and 10% statistical significance levels of the relevant parameter, respectively.

Table 3 exhibits “independent sampling t-test” and “one-way ANOVA test” results for evaluating the significance of relationships between donation amounts to the common pool and the two different cases of having either 100 ₺ or 1,000 ₺ available in respondents’ pocket. Since t-test results were statistically significant, it was concluded that the gender difference was found effective on the donation amount to the common pool. This finding suggested that the gender of participants accordingly their hereditary characteristics were significant variable effective on altruistic behaviors of participants. On the other hand, it is possible to conclude that the age of participants was not effective in their altruistic behaviors.

Regarding family characteristics or participants such as employment and education statuses of parents, there were two separate items in the survey. Father’s occupation was found as a significant variable effective on participants’ preferences. According to the one-way ANOVA analysis results, the father’s occupation was found determinant on the amount which students would donate to the common pool when they have imaginary 100 ₺ or 1,000 ₺. It was revealed that students whose father were

employed donated 22.60 ₺ (162.03 ₺ for 1,000 ₺) on average. Students whose father were unemployed donated 50 ₺ (436.86 ₺ for 1,000 ₺) on average. Indeed, students whose father was unemployed showed more altruistic behavior with respect to others. On the other hand, mothers' occupation was found insignificant for both available amounts in the pocket (Table 3). The donated amount when students' mother is unemployed was found close to the averages. If students' mother was housewife or unemployed, the average donation was estimated at 24.32 ₺ (181.36 ₺ for 1.000 ₺). On the other hand, students whose mother was employed preferred to make 24.52 ₺ donations (178.99 ₺ for 1.000 ₺) on average.

When education levels of parents of participants were taken into consideration with respect to their donation amount to the common pool, no statistically significant result was found. In quantitative analysis of the responses given to the survey items, average donation of students whose fathers were graduated from high school or higher institution was estimated at 21.60 ₺ (136.86 ₺ for 1,000 ₺), whereas average donation of students whose mother were graduated from high school or higher institution was estimated at 21.54 ₺ (141.91 ₺ for 1,000 ₺). In order to determine whether the family structure of participant students was effective in their donation amounts, students were asked if they have older or younger siblings. In this regard, average donation of students who did not have younger sibling was estimated at 25.62 ₺ (176.36 ₺ for 1,000 ₺), whereas average donation of students who did not have older sibling was estimated at 22.14 ₺ less by 13% (165.46 ₺ for 1,000 ₺; less by 6%). Average donation of students who did not have any sibling was estimated at 19.90 ₺ (108.93 ₺ for 1,000 ₺). It was also seen that while an average donation of students who was the eldest child of the family was estimated at 22.69 ₺ (179.27 ₺ for 1,000 ₺), it was 26.79 ₺ (193.39 ₺ for 1,000 ₺) for the youngest ones. However, there was no significant correlation between being the eldest or youngest child in the family and the amount donated to the common pool.

## Conclusion

The opposite behavior of selfish behavior has an important place in the philosophical thought system of altruism (welfare society and social state). The behavior of altruism, which can be expressed as a sacrifice or sharing without waiting; is generally accepted in Turkish society. The literature on social preferences beyond economic preferences; focused on experimental studies to understand altruism, which is also defined as the principle of concern or practice for the welfare of others. Both theoretical and experimental studies to analyze the possible components that affect the decisions of the people who exhibit an altruistic attitude and continued the statement, similar studies about Turkey has been realized newly. Studies on altruism behavior of many cultures were observed. Although it was analyzed at the sample level only, the specificity of this study was; it is the first study on the altruism of Turkish society.

Measuring individual or cultural characteristics of individuals is also closely related to the design of the experimental setup, and individual differences can be identified with games performed within the context of game theory. There is a wide range of literature that measures what level the decision-makers can be altruistic by using public goods games which is kind of game theory. In this study, it is aimed to investigate the social reasons for non-selfish preferences of young people's by using the survey method designed according to the public goods game. The survey was fulfilled with the students of Aydın Adnan Menderes University-Aydın Faculty of Economics. According to the definition of a rational man in the economics; at the end of the public goods game; the participants were expected to achieve the highest level gain with the contribution of "0", the results of the survey in this study showed similarities with the international literature. According to the definition of the "rational man-homo economicus" in the economics; at the end of the public goods game; the participants were expected to achieve the highest level gain with the contribution of "0", the results of the survey in this study showed similarities with the international literature. In the event that the participants have a certain amount of money, only 74 of 371 respondents are rationally committed to achieving the highest level of gain without making any contribution, while 297 have approached with the altruistic

attitude. Moreover, when the holding amount of participants is increased; the number of people who exhibited rational behavior decreased to 63, while the number of other people who acted altruistic behaviors increased to 308. When the results of the survey are analyzed statistically; it has been observed that the altruistic attitude of the young people's preferences does not show any change in any regions, in the sample level. Similarly, it was statistically tested that the age of the participants and it wasn't determinant of the altruism. On the other hands according to the results of the independent sample t-test; the preferences of contribution vary by gender. This is an indication of the fact that being a man or a woman is the determinant of altruism behavior. In addition, one-way analysis of variance (ANOVA) tested to measure the effect of family structures on other behaviors shows that there is a significant relationship between the father's occupation level and other behaviors even though the mother's occupation level does not contain any statistical significance. In order to measure the family structure of the participants, the responses of the participants whether they have a sibling is statistically; he showed that having an older brother or being an only child was not the determinants of altruism.

Regarding measuring the effect of family structures of participants on their donations, the answers of students for the questions about their siblings were found statistically insignificant. Furthermore, having an elder sibling or being a single child in a family was not found significant determinants of altruism.

In the public goods game, it is expected that participants to make zero donation to the common pool. On the other side, behavioral economics models address the existence of preferences different than personal interests of a rational man being the assumption of core economics. When survey results were taken into consideration, it was seen that while 74 participants preferred not to make a donation to common pool when they had 100 ₺, the rest of 297 students preferred to donate an amount between 1 and 100 ₺ to the common pool. In the case of having 1,000 ₺, while their donation amount increased, the number of zero-donators decreased to 64.

When youngsters were asked how much amount they would donate to the common pool that would be shared among them in the public

goods game if they either had 100 ₺ or 1,000 ₺, on average students preferred to donate 24.71 ₺ and 175.92 ₺ if they had 100 ₺ and 1,000 ₺, respectively. The increase in the average donation from 24.71 ₺ (if they had 100 ₺) to 175.92 ₺ (if they had 1,000 ₺) could imply increasing altruism behavior among young people along with their increasing opportunities. Yet, empirical studies in the relevant literature (Andreoni 1988; Andreoni 1989; Andreoni 1993; Andreoni and Miller 1993; Lenyard, 1994; Anderson et al. 1998; Cason et al. 2002; Anderson et al. 2011) contains similar behavior and it is seen that the greater the beginning amount made available to subject's participants of the public goods game, the higher the donation they make. In this context, it is possible to conclude that the findings of our study were in conformity with the findings reported by the literature.

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