Master Thesis

Double it and give it to the next person:

An economic experiment on cooperative behavior

Submitted by

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Abstract

To study altruistic preferences, an online experiment was conducted in which participants were randomly assigned a position and, depending on that position, were offered a certain amount of money. With each position, the amount was doubled. Decisions were made simultaneously, and the person, with the lowest position to accept the amount, received the money. The offered amounts ranged across all three variations of the experiment from $0.03 to $61.44. A total of 63 people participated, and the average payout was $0.70. From $3.84 onwards, the amount was relatively likely to be accepted, and at $1.92, half of the participants indicated they would take the money. Only for amounts below $0.24 was the acceptance rate below 50%. Over the rounds, participants' willingness to cooperate decreased. The results contrast with the social media trend "Pass it and double it and give it to the next person," where the payout often ranged between $50 and $200. The difference between the results of the lab version and the social media trend suggests a significant discrepancy between altruistic behavior and genuine altruism, although there are limitations in comparing the two phenomena.

1. Introduction:

1.1 Background and Motivation

A trend on popular social media platforms has emerged. The scenario is quite simple: an interviewer offers a random person on the street the choice to take a certain amount of money or double the offered amount and pass it on to the next random person, whom the person won't know. A notable pattern emerges—most people choose to double the offer and pass it on, resulting in an accumulating chain of generosity that continues until someone finally decides to accept the offer. In fact, this simple Game mirrors classic behavioral economics studies, which explore altruism in public settings. It identifies the point at which individuals choose to break the doubling chain and accept the offered amount. Typically, in the videos, this threshold is reached at amounts between $50 and $200.

This threshold may indicate a point at which egoistic preferences overcome altruistic ones. (Trope, o. J., 2023) And therefore provides interesting insights into human preferences. However, the public nature of this experiment introduces potential biases. The presence of an audience and the interviewer's implicit expectations may influence participants' decisions, leading to behavior that appears altruistic but may be motivated by social pressures and expectations.

To disregard these effects and examine true altruism, we are conducting a laboratory version of the experiment. The controlled lab version will be made available online. In the baseline experiment, 10 players who have no contact with each other will be assigned a position from 1 to 10 and offered a hypothetical amount of money depending on their position. The first person starts with an amount of 3 cents, and the next person is offered double, i.e., 6 cents, and so on. Due to the exponential increase, the last person in position 10 has the possibility to have access to a hypothetical amount of $15.36. Only the person who first indicates in the doubling chain that they would take the money receives it. Afterward, all 10 players are informed which position took the money first and what amount they earned. Then, a new round begins. The same number of rounds are played as there are participants so that, in theory, every participant could hold each position at least once. Two more treatments will be conducted, varying the incentives by changing the starting value and the number of participants and rounds.

1.2 Research Question and Objectives

Primary Research Question: How do variable incentive structures and contextual factors influence the willingness to cooperate in the economic experiment "Double it and give it to the next person"?

Sub-question 1: At what amount does individual well-being become more important than the potential to provide a greater benefit to the community?

Sub-question 2: Are there demographic patterns in the decision-making of the participants?

The primary goal of this master's thesis is to gain a deeper understanding of human behavior in the context of altruism, cooperation, and selfishness, particularly focusing on the point at which individual well-being is prioritized over communal benefits. By exploring these dynamics through comprehensive literature review and experimental studies, the thesis aims to contribute to the development of effective strategies for promoting cooperation in social dilemmas, with practical applications in resource management and the common good.

1.3 Structure of the Thesis

This experiment has various parallels to already researched phenomena in behavioral economics, which will be discussed in the theoretical framework. The methodology section will describe a more detailed implementation of the experiment. The results section will visually present the outcomes and compare them across the different treatments. The acceptance rates of the participants will also be analyzed in positional and demographic context and tested for significance using hypothesis testing and the results will be placed in the context of current research. A deeper interpretation of the results and their implications follow in the discussion. Finally, the key findings will be presented, and recommendations for future research will be provided.

2. Theoretical Framework

To investigate the various phenomena of the experiment in more detail, the following section will present important literature and established findings in the field of research, and demonstrate their relevance to the proposed experiment. To clearly and easily identify our experiment, the term "Topad Game" will be frequently used, derived from "Take or Pass and Double".

2.1 Literature Review

2.1.1 Homo Economicus

The development of classical economic theories, particularly those related to market behavior, was significantly influenced by the concept of Homo Economicus, which was introduced in the 18th century and first shaped by the work of Adam Smith. However, the idea that humans act purely rationally, only maximizing their own profit and base their decisions on complete information has been thoroughly challenged in the centuries that followed, leading to the emergence of behavioral economics (Rajagopalan, 2015). Here are some of the most famous experiments of the field and their similarities to the Topad Game:

2.1.2 Ultimatum Game

The Ultimatum Game was first developed by Werner Güth and colleagues (Güth et al., 1982). It was derived from the final round of a bargaining experiment and allows a proposer to decide the allocation of a certain amount of money and present it to a responder, who then has the option to accept or reject the deal. According to the Homo Economicus model, the responder should accept any amount greater than 0, and the proposer should offer just slightly more than 0. However, the experiment demonstrates that this is not the case, indicating that Homo Economicus does not exist like that in this context. Instead, the experiment revealed that offers of 40-50% were typically made, and offers below 30% were predominantly perceived as unfair and were rejected. The Ultimatum Game thus showed that people often do not act based solely on economic considerations; fairness and social justice are important factors in decision-making processes.

A comprehensive meta-analysis by Oosterbeek and colleagues in 2004, which included 37 studies, demonstrated that there are significant cultural differences both in the offers made by proposers and in the acceptance rates by responders (Oosterbeek et al., 2004). Cultures with a higher degree of market orientation tend to make lower offers, while cultures with stronger social norms emphasizing fairness make higher offers and are less inclined to accept low offer. In the planned experiment, participants from different cultures might make different decisions. Sorting the acceptance rates by participants could provide a more detailed insight into whether people from different nations act more altruistically, assuming a sufficiently large number of people from various nations are present.

The introduction of competition significantly changes the behavior of the players. More players lead to a competitive environment among the responders, reducing the participants' preferences for fairness (Xinqing Luo et al., 2018). As a result, lower offers are more likely to be accepted. Similarly, in our experiment, the perception of more participants, who can act similarly to responders in a certain sense, could lead to lower offers being accepted more readily.

2.1.3 Dictator Game

The Ultimatum Game measures both altruism and strategic behavior (e.g., fear of rejection). To eliminate the latter variable, the Dictator Game was introduced four years later by Daniel Kahneman, Jack Knetsch, and Richard Thaler (Knetsch & Thaler, 1986). In the Dictator Game, the "dictator" has full control over the allocation of money, and the responder cannot reject the offer. This removes the negotiation component present in the Ultimatum Game and focuses solely on the decision of the proposer regarding how much they are willing to share. This change was introduced to see if people are willing to voluntarily give away some of their own money even when there is no pressure or incentive to do so. It is used as a measure of altruism, social preferences, and fairness. Since the Topad Game also involves the voluntary choice between gifting and keeping money, these factors can be observed and more precisely determined through the experiment.

Engel conducted a meta-analysis to aggregate data from 129 published studies on Dictator Games (Engel, 2011). These studies include 616 different experimental conditions that test various aspects and manipulations within Dictator Games. The

meta-analysis includes both descriptive statistics and multiple regression models to assess the impact of specific experimental manipulations on participant behavior. These are there main findings of the analysis:

In the Dictator Game, dictators on average give about 28.3% of their received money to the recipient. This level of generosity exceeds the predictions of the Homo Economicus model, showing one more that people tend to be more altruistic than pure economic models would predict. An interesting question is whether a similar rate in the Topad Game e.g. the acceptance rate could provide insights into altruism and social norms. Therefore, the acceptance rates will be calculated for each participant, but also for every position, round and value.

Various factors influence the behavior of dictators in the game. For example, it has been observed that dictators who are socially identifiable or under social scrutiny tend to give more (Engel, 2011). Since participants in the Topad Game are relatively anonymous on the internet, this could lead to a significant increase in acceptance rates and more frequent interruptions in the doubling chain, unlike in the original version of the game shared on social media, where participants were identifiable.

Another important factor is the perceived deservingness of the recipient. Dictators give more when the recipient is seen as deserving, such as when they are donating or when the recipient has "earned" the money.

The stakes also play a role: the higher the stakes, the less generous the dictators tend to be. The meta-study shows that for each additional dollar, the generosity rate decreases by 2% (Generosity= 0,326−0,002×Stake). This could also be relevant in the Topad Game, particularly in the later rounds where the absolute amounts rise to as much as $32, potentially promoting more selfish behavior (Engel, 2011).

Engel highlits also demograph differences: women tend to be more generous than men (5,8%). Students share 15.1 % less of their received money than Non-Students. and older individuals tend to give more than younger ones. However, with a relatively small number of participants, it may be difficult to detect these effects.

Another surprising finding of the study is that dictators give less the closer they feel to the recipient socially. Since social proximity is removed in the Topad Game, this could increase generosity rates and therefore decrease acceptance rates.

Finally, it has been found that dictators who handle real money (coins or bills) tend to give more. Since we are using entirely digital money in our experiment, unlike the original experiment shared on social media, this could increase the willingness to accept the money, as the emotional attachment to physical money is absent.

2.1.4 Centipede Game

Another experiment that bears parallels to the Topad Game is the Centipede Game. The Centipede Game is a sequential game in game theory, introduced by Robert Rosenthal (Rosenthal, 1981). It is typically played between two players who take turns deciding whether to take a growing sum of money ("Take") or pass the game to the other player ("Pass"). The amount that the two players can win increases significantly at each decision point, but only one player benefits from each increase. The player who benefits more at a given point has the opportunity to take the money. There is thus a strong incentive to cooperate to increase the total sum, but also a strong incentive to claim the higher amount at a certain point, as the amount will decrease for them at the next decision node. Most players cooperate until the last or penultimate node before claiming the larger sum for themselves.

In the planned experiment, the "Take or Pass" decision, which increases the amount to be won is not made sequentially but made simultaneously. Therefore it is uncertain whether the previous players have actually passed the money. Moreover, there is no opportunity to benefit from one’s own "Pass" decision within the same round, which keeps the strategic component minimal and only marginally relevant for future rounds, as players remain uncertain whether they would benefit from reciprocal actions of other players due to their own position in the game.

2.1.5 3-player Cenitpede Game

The low-paid 3-player Centipede Game by McKelvey and Palfrey interestingly bears an even greater resemblance to the Topad Game (McKelvey & Palfrey, 1992). The payout amounts for the respective winners of the rounds are very similar to those in our experiment. They start with 10 cents and double the amount for the winner every node until the 9th position, which contains a payout off 12.80 Dollars for the winner. Furthermore, the likelihood of receiving the monetary amount is further reduced due to the involvement of a third player. However, this game is also sequentially structured, which means that the only conditional acceptance probabilities—i.e., the likelihood of

the amount being taken at a given node, under the circumstances that it reaches that node—might show some similarity. The highest conditional acceptance rate occurred when the decider had the opportunity to gain $6.40. Nonetheless, the fact that a player has the certainty of being able to win and, on the other hand, the opportunity to increase the amount for all involved, including themselves, will have a significant influence on their decision-making.

2.1.6 Backward Induction and Nash equilibrium

To find the theoretically optimal strategy for a player in games like the Centipede Game, one can use backward induction to analyze the Nash equilibrium. This approach reveals what a rational player with complete information would do to maximize their outcome by starting at the last node, analyzing the best decision for each player, and then, based on that assumption, moving to the previous node and analyzing the decision there, and so on. However, this strategy only applies to the Homo Economicus concept, as it assumes that all players would always take the money at every opportunity, leading to a Nash equilibrium where the money is taken immediately. The same principle applies to the Topad Game—each player should theoretically always choose to take the money.

2.1.7 Public Goods Game

In this game, participants anonymously decide how much of their private endowment to invest in a collective project. Contributions to the public good are then evenly distributed among all participants, regardless of individual investment. The game illustrates the dilemma between individual incentives and collective benefit, as maximizing individual gain often leads to underinvestment in the public good, which in extreme cases can result in a social dilemma and the tragedy of the commons where one's own self-interest, deplete or degrade a shared resource, leading to long-term harm for the entire group (Fehr & Gächter, 2000).

Similarly, in the Topad Game, cooperative behavior—where a guaranteed gain is forfeited—is returned to the community through a multiplier, reflecting a non-profit gain. However, the key difference is that in the Public Goods Game, all players benefit equally, while in the Topad Game, only one individual can benefit from the collective contribution. In the Public Goods Game with punishment, it is observed that contributions and thus trust in other players decrease from round to round. Similarly,

in the Topad Game, the winnings and the pass rate may decrease from round to round, if participants become disappointed with the cooperation levels of the other players.

Furthermore, I would like to mention other effects that may occur. Although these have also been demonstrated with illustrative experiments, they do not have relevant parallels to the Topad Game, so I will not elaborate on them further.

2.1.8 Gift Exchange

The Gift Exchange effect refers to the phenomenon where employees increase their work performance when they receive an unexpected reward or bonus from their employer, which is considered a form of reciprocity. This effect has been studied in various contexts to understand how social preferences and reciprocity influence behavior in the workplace (Akerlof, 1986).

Gift exchange effects could occur if a large number of players act benevolently, which might encourage other players to also act benevolently. The problem, however, is that only benevolent decisions made at the beginning of the experiment are revealed due to the length of the doubling chain and the resulting gain. If an individual acts selfishly early in the round, the altruistic decisions of other players later in the doubling chain may not be noticed.

2.1.9 Fatigue Effect

Repeated games also have an impact: generosity decreases in repeated games compared to one-time games, which Engel in his meta-analysis attributes to a fatigue effect. In our experiment, which is also repeated multiple times, this effect could lead to participants becoming less generous over time.

2.1.10 Endgame Effect

Endgame effects occur when individuals or groups alter their behavior upon realizing that a situation is nearing its end. These behavioral changes can impact cooperation, strategies, or work efforts, and they hold important implications for understanding decision-making processes within limited time frames (Fehr & Gächter, 2000).

In the Topad Game, endgame effects might also emerge in the final rounds or the last round because participants know that selfish behavior will no longer have long-term negative consequences for them.

2.1.11 Learning-Effect

Another effect that might influence the decision of the players over multiple rounds might be the Learning effect because the feedback that the players receive after each round might influence their decision for the next round. They could be disappointed by a lower acceptance that they thought would not be worth it and adapt to it (C. Camerer, 2003).

2.1.12 Bounded Rationality

Bounded Rationality acknowledges that human decision-making processes are shaped by cognitive and informational limitations, making it impossible to always make optimal decisions. Instead, people aim for solutions that are "good enough" and use simplified decision-making strategies. This concept is fundamental to behavioral economics, which captures the complexity of human behavior more effectively than traditional economic model (Krämer, 2014).

In response to this, Kahneman and Krämer developed the theory that humans possess two different modes of thinking: Thinking Fast and Thinking Slow.

System 1 is fast, instinctive, and emotional. It is responsible for most everyday decisions, such as recognizing faces or quickly assessing dangerous situations.

System 2 is slow, logical, and deliberate. It requires conscious effort and is used for complex tasks, such as solving mathematical problems or weighing different options.

In this experiment, decisions will likely be made within seconds, between the announcement of the winner's position and the decision about the next doubling. Therefore, the fast thinking system will predominantly be used, which is not always rational and is often guided by emotions and heuristics.

2.1.13 Framing

Furthermore Krämer and Kahnemann describe the framing effect which demonstrates that human decisions are also strongly influenced by the presentation and context of information.

Therefore, the decision options in the experiment are presented as simply as possible to avoid influencing the participants. Similarly, the announcement of the player who receives the payout in a round is communicated to the players in a manner that is as emotionless and factual as possible.

2.1.14 Left Digit Bias

The effect where people are more likely to perceive the number before the decimal point rather than the number after it is known as the Left-Digit Bias (Thomas et al., 2005).

In the proposed experiment, the jump from $1.92 to $3.84 could be perceived as a tripling of the payout rather than just a doubling, due to this bias.

2.1.15 Loss aversion

Loss aversion might also play an important role when deriving concepts from the experiment's outcomes. Since the experiment is only about gaining money, the willingness to gift money could be perceived as a loss. Kahneman and Tversky state that the joy of gaining a sum is not as intense as the pain of losing the same amount. In fact, the pain feels greater, resulting in what they call loss aversion (Kahneman & Tversky, 1979).

2.1.16 Monetary Incentives

There have been several studies investigating whether the amount of payouts in economic experiments significantly affects participants' decisions. The results of these studies often suggest that higher payouts have only a limited or no major effect on participants' behavior (C. F. Camerer & Hogarth, 1999).

2.1.17 Altruism

In the end, we should reflect on how altruistic behavior comes about.

"Altruism is the willingness to bear a cost in order to benefit someone else. However, people often exhibit what I call 'impure altruism,' where their generosity is motivated not only by the desire to help others, but also by the 'warm glow' they feel from being seen as generous." (Andreoni, 1990)

So altruistic behavior consists of genuine altruism on the one hand and the desire to be perceived as altruistic on the other. This effect of impure altruism might be particularly evident in trends shared on social media. Our experiment could make a valuable contribution to measuring pure altruism.

2.2 Theoretical Foundations

The acceptance rate is the dependent variable that will be examined against independent variables to identify and name patterns.

2.2.1 Positional Dependency

At a certain point, participants will prioritize the monetary value of the offer over the opportunity to act altruistically. This tipping point occurs when a participant chooses to accept the money and not double it for the next person, thereby breaking the altruistic doubling chain.

The key question is likely: when do participants typically prefer to keep an offered amount instead of passing it on, thus acting more selfishly than altruistically? Our goal is to understand at what point individuals are more inclined to accept an offer, favoring their personal gain over the potential greater common good.

To investigate this, the null hypothesis is:

Null Hypothesis 1: There is no specific amount at which participants are more likely to accept rather than reject the offer, with $p \leq 0.5$.

While p is the actual acceptance rate in the population.

Additionally, we aim to test whether the number of rounds influences participants' behavior, potentially leading to a learning effect or preventing an endgame effect. Specifically, we want to answer the question: are participants more likely to accept offers in later rounds compared to earlier ones?

For this, the second null hypothesis is:

Null Hypothesis 2: There is no significant correlation between the number of rounds played and the acceptance rates for every round.

To test this hypothesis, a Pearson correlation analysis will be conducted to determine whether there is a significant positive correlation between the number of rounds played and the acceptance rate.

2.2.2 Demographic Dependency

Furthermore, the acceptance rates should be tested for demographic patterns, similar to the studies on altruism found in the literature.

A factor often discussed in the existing literature is the gender difference between women and men. It is often suggested that women act and are expected to behave more altruistically, and if this holds true in our experiment, we would expect a lower acceptance rate among women compared to men.

Null Hypothesis 3: ***There is no significant difference in acceptance rates between women and men.***

Additionally, the literature highlights significant differences in acceptance rates between students and non-students. Past studies have shown that students tend to behave in a more profit-oriented manner, which should result in a higher acceptance rate. To test this, the following null hypothesis is proposed:

Null Hypothesis 4: ***There is no significant difference in acceptance rates between students and non-students.***

Moreover, many reports in behavioral economics and other fields suggest that older individuals tend to act more altruistically than younger people. To test whether this is the case in our study, we will analyze the acceptance rates across different age groups, hypothesizing that the acceptance rate will decrease as age increases. Participants will be grouped by age.

Null Hypothesis 5: ***The acceptance rate decreases as participants' age groups increase, so a negative correlation exists between these variables.***

3. Methodology

3.1 Experimental Design:

This section describes the procedure of the experiment and how it functions. Then, the various variations are explained. Subsequently, the expected form of the data is presented, and an analysis is conducted on how the hypotheses can be addressed based on this data.

3.1.1 Preparation for the Experiment:

The experiment will initially proceed with 10 players participating simultaneously. The only participation requirements will be that they are registered on the chosen platform and speak fluent English. Each player will first receive the instructions and then answer two control questions. The instructions will inform them about the number of players and explain exactly how the game works. Once this is done, the experiment will begin.

Gameplay:

At the beginning of each round, a certain amount of money is offered to each of the ten participants. The offered payout $f(x)$ depends on the randomly assigned position x and the starting value S:

$$f(x)=S\times 2^{(x-1)}$$

Thus, the player in position 1 is offered the starting value. The player in position 2 is offered double the starting value. The player in position 3 is offered four times the starting value, and so on.

Each participant can choose to either accept the offered amount or pass it on to the next position, who could receive double the amount. The decisions are made simultaneously. After all participants have made their decisions, the winner of the round is determined. The player in the lowest position who accepts the offered amount receives the payout. All participants are informed of the position where the amount was first accepted and what payout was achieved. After that, a new round begins.

If the amount is passed on to the last position without being accepted by any participant, the player in the last position automatically receives their offered amount.

The game consists of as many rounds as there are participants, so that each player can occupy each position at least once, introducing a certain fairness. The assignment of positions is intentionally not done in such a way that each player occupies each position exactly once, in order to minimize the strategic variable in the participants' decision-making.

3.1.2 Variations of the Topad Game

In the present study, the Topad Game is conducted in three different versions to analyze the decision-making processes of the participants under varying conditions. These variations allow for an examination of how different starting values, rounds, and the number of participants at certain amounts and positions influence decision-making behavior.

3.1.2.1 Baseline Experiment

Starting value: 3 cents; Number of rounds and players: 10; Final value: $15.36
In this configuration, the game begins with a low stake. This baseline version serves as a control condition to assess the effects of the other variations and to analyze acceptance rates depending on the position as well as the amount values.

3.1.2.2 Treatment 1

Starting value: 12 cents; Number of rounds and players: 10; Final value: $61.44
In this treatment, the starting value is increased, significantly raising the potential final amount. This adjustment tests whether a higher initial amount influences participants' willingness to accept the amount and whether this decision is possibly more dependent on the participant's position in the chain.

3.1.2.3 Treatment 2

Starting value: 3 cents; Number of rounds and players: 12 Final value: $61.44
In this variation, the starting value remains identical to that of the baseline experiment, while the number of rounds and players is increased to twelve, resulting in a final amount equivalent to that of Treatment 1. This configuration combines elements of both previous experiments and, due to the longer doubling chain, leads to more decision points. This allows for comparisons of the decision-making processes with both the baseline experiment and Treatment 1.

3.1.3 Objective of the Variations

The primary goal of the different game variations is to investigate how different initial conditions and durations of the doubling chain influence decision-making behavior in the controlled economic experiment. The variations are designed to provide insights into whether and how the size of the initial amount and the length of the decision chain increase the likelihood that participants decide earlier in the chain to accept the amount or whether they act more altruistically and don’t decide for their own benefit in favor of a potentially larger gain for others.

3.2 Data Sources

Based on the baseline experiment, there are 10 decisions per round, one from each participant. With 10 rounds, this results in a total of 100 decisions. This applies to both the baseline experiment and the first treatment. In the second treatment, we will have 12 x 12, so 144 decisions in total. Acceptance rates will be calculated from these decisions, both across the rounds and for each position and amount. Additionally, the acceptance rates for individual players will be generated and compared with their demographic data to analyze potential patterns and resulting effects.

On the one hand, the data for decisions and positions will be collected using a Python program. The corresponding demographic data of the participants will be provided by the platform Prolific, from which the experiment will be accessed. In the end, there will be a large CSV file containing all the decisions and outcomes of the respective rounds, linked with the most important demographic data of the participants. Based on this file, sub-files will be created, and the decisions and demographic data will be automatically sorted by relevant characteristics using further Python scripts, then visualized with Matplotlib and Excel. The statistical tests will be conducted using the Statsmodels and the SciPy libraries in Python.

3.3 Analysis Methods

In this section, the statistical methods and models used for analysis are broken down by hypothesis.

Null Hypothesis 1: There is no specific amount at which participants are more likely to accept rather than reject the offer, with $p \leq 0.5$.

The binomial test is the method of choice. Even though independence is not fully given, variances could arise within the groups, and the rounds are likely to develop different effects. In the beginning, strategic effects might occur, while at the end, learning, fatigue, and endgame effects could play a role. Nevertheless, the binomial test seems to be a suitable measure, as ignoring the dependencies across rounds allows the test to be conducted using a certain average, which helps balance the negative and positive effects on the true acceptance rates per value. Using the SciPy library, the p-values for the hypotheses will be calculated. Due to the mentioned limitations, we will set the α-level to 1% to ensure a high level of confidence.

Null Hypothesis 2: There is no significant correlation between the number of rounds played and the acceptance rate.

A Pearson correlation test is used for the correlation analysis, utilizing the SciPy library.

Null Hypothesis 3: ***There is no significant difference in acceptance rates between women and men***

Null Hypothesis 4: ***There is no significant difference in acceptance rates between students and non-students.***

Null Hypothesis 5: ***The acceptance rate decreases as participants' age groups increase.***

All of these hypotheses should be addressed using the linear regression model oft he Stasmodel Python library. The group variance will be particularly interesting to observe in order to identify any differences within the groups. Overall, the data should meet a significance level of α=5%.

4. Conduct of the Experiment

In this section, I will provide a more detailed explanation of the technical implementation of the methodology. First, the development progress of the experiment will be described, followed by a comprehensive presentation of the platforms and tools used for data collection.

4.1 Preparation and Setup

The experiment was implemented using Python and the oTree framework, which is particularly well-suited for research in experimental economics. The experiment was hosted on Prolific, a platform chosen over the more common alternative, MTurk, due to Prolific's promise of higher data quality and its better suitability for scientific research. Additionally, Prolific offers easier integration with oTree compared to MTurk.

To get a more visual understanding of how the experiment works, please refer to the appendix. Starting from Figure 17, the various screens a participant goes through are presented chronologically.

The experiment was divided into three parts: the initial stall screen, the instructions and control questions, and the final experiment.

Now, let's get into the technical realization of the program. The experimental design is structured around three primary classes: Constants, Group, and Player. The Constants class contains general information that remains consistent across all treatments, such as the starting value, the number of rounds, and the number of players. The Group class stores data that is common to all participants but changes during the experiment, such as the winner of each round and their corresponding payout. The Player class tracks the individual decisions made by each participant. Participants were automatically guided through the various decisions, with waiting screens between each decision, as the outcomes could only be evaluated once all decisions were made. The choices were recorded under the "take" attribute within the Player class. The experiment's backend was designed to determine a winner based on these decisions. Specifically, the program sequentially checks each player's "take" attribute, starting from the player with the lowest position, and the first player with a "True" value is designated as the winner. This player's position is then recorded in the

"winner" attribute of the Group class. After each round, all participants were informed of the outcome, including who received the money and the amount that was awarded.

Player positions were assigned randomly by a Python script that generated a random matrix, ensuring that each participant was assigned a random position. This randomness was crucial to allow each player to occupy any possible position across different rounds, thereby eliminating systematic biases. As part of the experiment's iterative refinement, waiting screens were introduced to help participants gauge the progress of others and manage their expectations regarding waiting times. Additionally, timers were implemented to prevent participants from spending too much time on a single page.

To enable the online execution of the experiment, a compressed file containing the entire program was prepared and uploaded to oTreeHub, a specialized website for hosting oTree projects. This file was then linked with the server provider Heroku, enabling the experiment to be accessible via the internet. oTree provides an admin interface that allows for the oversight of the experiment, including the ability to restart a session, distribute special links in case a participant loses theirs, or provide assistance if someone encounters an issue. Prolific allows for the distribution of unique URLs to participants, which include embedded participant IDs. These IDs were automatically captured by the oTree program, ensuring seamless data integration and participant tracking.

At the conclusion of the experiment, participants were thanked for their participation and provided with a completion code and link, enabling them to verify their completion to Prolific.

The data generated from participants' decisions and responses were exported from oTree in the form of a CSV-file. This data was then processed using Python, with the Pandas library employed to structure the data for clarity and comparability. The final step involved linking the geographic and demographic data of participants, sourced from Prolific. This connection between data sources allows for a comprehensive analysis of behavioral patterns across different participant profiles.

4.2 Experiment Procedure

The start of the experiment had a few challenges. First attempts highlighted areas for improvement that needed to be addressed in order to generate meaningful and reliable data. In total, three iterations were necessary to achieve the optimal conditions for data collection. The following section details the key issues encountered and the subsequent adjustments made.

Initially, the control questions revealed significant comprehension issues among participants. Although the instructions were clearly and precisely formulated, they were found to be too concise, making them difficult for some participants to understand. To address this problem, the instructions were revised. The new instructions were modeled like previous economic experiments, where a chronological description of the procedure and available actions had proven helpful. Additionally, example and a summary were included to provide participants with a longer but more comprehensible explanation of the experimental process. These measures significantly improved participants' understanding and helped prevent misunderstandings.

Another issue that arose at the start of the experiment was the absence of players during the decisions. Porbably Blank waiting screens led some participants to attend to other tasks, causing them to miss the continuation of the experiment. To solve this problem, so-called Live Pages were introduced, displaying the progress of other participants in real time. This encouraged players to stay at their screens and patiently wait for slower participants, which increased overall engagement and attentiveness.

For participants who had difficulty making decisions or simply took too long, a timer was implemented. This timer provided a gentle reminder after an appropriate amount of time had passed, prompting participants to make a decision to maintain the flow of the game and minimize waiting times for others. This change proved effective in accelerating the game’s progress and reducing the overall duration of the experiment.

Additionally, a feedback field was introduced, allowing participants to provide suggestions, comments, or report issues during or after the experiment.

Following these adjustments, the baseline version and both treatments of the experiment were successfully conducted. To increase the statistical significance and robustness of the results, the sequence of experiments was repeated. In total, six experiments were conducted with 64 participants, resulting in the collection of 688

decisions. This comprehensive data collection enabled the drawing of well-founded conclusions about participants' decision-making behavior and allowed for the testing of the experiment's hypotheses.

It should be noted that one person appeared to be completely offline, and their decision was only ever counted as a pass. This occurred in the final variation of the second treatment, and their decision was therefore not included in the calculations of the acceptance rates.

4.3 Data Collection

The data collected during the experiment were systematically compiled and stored in a central CSV-file. This file served as the foundation for further analysis, enabling various comparisons and evaluations. The structured data collection allowed for a clear presentation of the results and a precise examination of the experimental variables.

The central file contains all relevant information, including demographic data of the participants, individual decisions in each round, the respective positions of participants in the decision sequence, and the specific conditions of each treatment.

Furthermore, a Python dictionary was implemented that included the acceptance rates of the participants and the groups they were in, all linked with their demographic data.

With this Python dictionary, various comparison methods were developed to investigate the effects of different experimental conditions on participants' decision-making behavior. These comparisons enabled the identification of differences between treatments as well as possible correlations between demographic characteristics and decision-making behavior. However, it is important to consider that these acceptance rates are not independent of each other, as they were influenced in each variation of the experiment by the information participants received about others' decisions, particularly regarding which position took the money first.

The collected data are presented in detail in the following sections, highlighting the key findings and observations. This presentation aims to clearly and comprehensively communicate the insights gained and to provide a foundation for interpreting the results in the context of the research questions.

5. Results

First, the decisions made by each position during the experiment are displayed for each treatment. Following this, comparative graphs are presented, showing the acceptance rates over the offered values, positions, and rounds. Lastly, the control question will be evaluated.

5.1 Descriptive Statistics

These grids contain the 'Take' variable for each position throughout every round. The acceptance rates for all rounds and positions are also displayed. The blue cells indicate the winner of each round, which is revealed to every participant after each round. Green represents a 'pass' decision, while red indicates a 'take' decision. 'Ratio' represents the respective acceptance rates of the corresponding column or row.

5.1.1 Baseline Experiment

Starting value: 3 cents; Number of rounds and players: 10; Final value: $15.36

Position	1	2	3	4	5	6	7	8	9	10	
Round	0.03	0.06	0.12	0.24	0.48	0.96	1.92	3.84	7.68	15.36	Ratio
1	0	0	0	0	0	0	0	1	1	1	0.3
2	0	0	0	0	0	0	1	1	0	1	0.3
3	0	0	0	0	0	0	0	1	1	1	0.3
4	0	0	0	1	1	0	1	1	1	1	0.6
5	0	0	0	0	1	0	1	1	1	0	0.4
6	0	0	1	1	1	1	1	1	1	1	0.8
7	1	0	0	0	1	0	1	1	0	1	0.5
8	0	0	1	0	0	1	1	1	1	1	0.6
9	0	0	0	1	0	1	1	1	1	1	0.6
10	1	0	0	1	1	1	1	1	1	1	0.8
Ratio	0.2	0.0	0.2	0.4	0.5	0.4	0.8	1.0	0.8	0.9	0.52

Figure 1: Baseline Experiment 1

Position	1	2	3	4	5	6	7	8	9	10	
Round	0.03	0.06	0.12	0.24	0.48	0.96	1.92	3.84	7.68	15.36	Ratio
1	0	0	0	1	1	0	1	1	1	0	0.5
2	0	0	0	0	0	1	1	1	1	1	0.5
3	0	0	1	1	0	1	1	1	1	0	0.6
4	0	0	1	0	1	0	0	1	1	1	0.5
5	0	0	0	0	0	0	1	1	1	0	0.3
6	0	0	1	0	1	0	1	1	1	0	0.5
7	0	0	1	0	0	0	1	1	1	1	0.5
8	0	0	1	0	1	0	0	1	1	1	0.5
9	0	0	1	1	1	0	0	1	1	1	0.6
10	0	1	1	1	1	1	0	0	1	1	0.7
Ratio	0.0	0.1	0.7	0.4	0.6	0.3	0.6	0.9	1.0	0.6	0.52

Figure 2: Baseline Experiment 2

5.1.2 Treatment 1

Starting value: 12 cents; Number of rounds and players: 10; Final value: $61.44

In the first treatment, only the starting value was changed, resulting in different values for each position and a higher possible payoff at the end.

Position	1	2	3	4	5	6	7	8	9	10	
Round	0.12	0.24	0.48	0.96	1.92	3.84	7.68	15.36	30.72	61.44	Ratio
1	0	0	0	0	0	1	1	1	1	1	0.5
2	0	0	0	0	1	1	1	1	0	1	0.5
3	1	0	0	1	0	0	1	1	1	1	0.6
4	1	0	1	0	0	1	1	0	1	1	0.6
5	0	0	0	1	1	1	1	1	1	1	0.7
6	0	0	0	0	0	1	1	1	1	1	0.5
7	1	1	0	1	0	1	0	1	1	1	0.7
8	1	0	0	0	1	1	0	1	1	1	0.6
9	0	0	1	0	0	1	1	1	1	1	0.6
10	0	1	1	0	0	1	1	1	1	1	0.7
Ratio	0.4	0.2	0.3	0.3	0.3	0.9	0.8	0.9	0.9	1.0	0.6

Figure 3: Treatment 1, Replication 1

Position	1	2	3	4	5	6	7	8	9	10	
Round	0.12	0.24	0.48	0.96	1.92	3.84	7.68	15.36	30.72	61.44	Ratio
1	0	0	0	1	0	0	1	0	1	1	0.4
2	1	0	0	1	0	1	1	1	0	1	0.6
3	0	0	1	0	1	1	1	1	0	1	0.6
4	1	0	1	0	0	1	1	1	1	1	0.7
5	0	0	0	1	0	1	1	1	0	0	0.4
6	1	0	1	1	0	1	1	1	0	1	0.7
7	0	0	0	0	0	1	1	0	1	1	0.4
8	0	0	1	0	1	1	1	1	1	1	0.7
9	0	0	0	1	0	1	1	1	1	1	0.6
10	0	1	0	1	1	1	1	1	1	1	0.8
Ratio	0.3	0.1	0.4	0.6	0.3	0.9	1.0	0.8	0.6	0.9	0.59

Figure 4: Treatment 1, Replication 2

5.1.3 Treatment 2

Starting value: 3 cents; Number of rounds and players: 12; Final value: $61.44

In the last treatment, the starting value of 3 cents was reintroduced, but the number of rounds and players was increased to 12, resulting in the same high possible payoff as in the first treatment.

Position	1	2	3	4	5	6	7	8	9	10	11	12	
Round	0.03	0.06	0.12	0.24	0.48	0.96	1.92	3.84	7.68	15.36	30.72	61.44	Ratio
1	0	0	0	1	0	0	0	1	1	0	1	0	0.33
2	0	0	0	0	1	0	0	0	1	1	1	1	0.42
3	0	0	0	0	1	1	1	1	0	1	1	1	0.58
4	1	0	0	0	1	0	1	1	1	1	1	1	0.67
5	1	0	0	0	0	1	1	0	1	0	1	1	0.5
6	0	0	1	1	1	0	1	1	1	1	1	1	0.75
7	0	1	1	1	1	0	0	1	1	1	1	1	0.75
8	1	0	0	1	1	0	1	1	1	1	1	1	0.75
9	0	0	0	0	1	1	0	1	1	1	1	1	0.58
10	0	0	0	1	1	0	1	1	1	1	1	1	0.67
11	1	0	1	0	1	0	1	1	0	1	1	1	0.67
12	0	0	1	0	0	0	0	1	0	1	1	1	0.42
Ratio	0.33	0.08	0.33	0.42	0.75	0.25	0.58	0.83	0.75	0.83	1.0	0.92	0.59

Figure 5: Treatment 2, Replication 1

Position	1	2	3	4	5	6	7	8	9	10	11	12	
Round	0.03	0.06	0.12	0.24	0.48	0.96	1.92	3.84	7.68	15.36	30.72	61.44	Ratio
1	0	0	0	0	0	0	0	1	1	0	1	1	0.36
2	1	0	1	0	1	0	0	0	0	1	1	1	0.55
3	0	0	0	1	0	0	0	1	0	1	1	1	0.45
4	0	0	1	1	0	0	1	1	1	1	1	0	0.64
5	0	0	0	0	0	1	0	1	1	1	1	0	0.45
6	0	0	0	1	0	0	1	1	1	1	1	1	0.64
7	0	0	0	0	0	1	0	1	1	1	0	1	0.45
8	0	0	0	0	0	1	0	0	1	1	1	1	0.45
9	0	0	0	0	0	1	1	1	0	1	1	1	0.55
10	0	0	0	0	0	0	1	1	1	1	1	0	0.45
11	0	1	0	0	0	0	0	1	1	1	1	1	0.55
12	1	0	0	0	0	1	0	1	1	1	0	1	0.55
Ratio	0.18	0.1	0.18	0.25	0.1	0.41	0.44	0.83	0.81	0.92	0.91	0.81	0.51

Figure 6: Treatment 2, Replication 2

In the last conducted variation, one participant didn't seem to be online. These positions are displayed in a lighter green. The decisions were set to 'pass' by default. In the acceptance rates, these decisions are not taken into account.

5.2 Combined Data

5.2.1 Acceptance Rate by offered Value

The following graphs show the average acceptance rate of the different treatments, displayed across the various values. Subsequently, the overall acceptance rates for all values are presented.

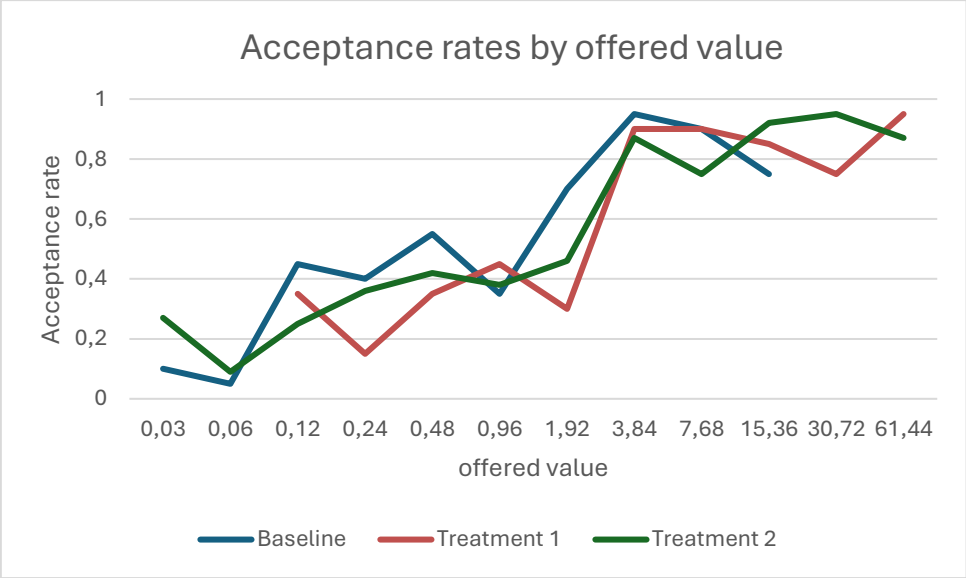

Figure 7: Acceptance rates of the different variations sorted by offered value

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Figure 7: Average acceptance rates by offered value

5.2.2 Acceptance Rate by offered Position

In the next graph, the average acceptance rates of the different treatments are displayed according to the position at which they occurred. Following that, the overall acceptance rates for all positions are shown.

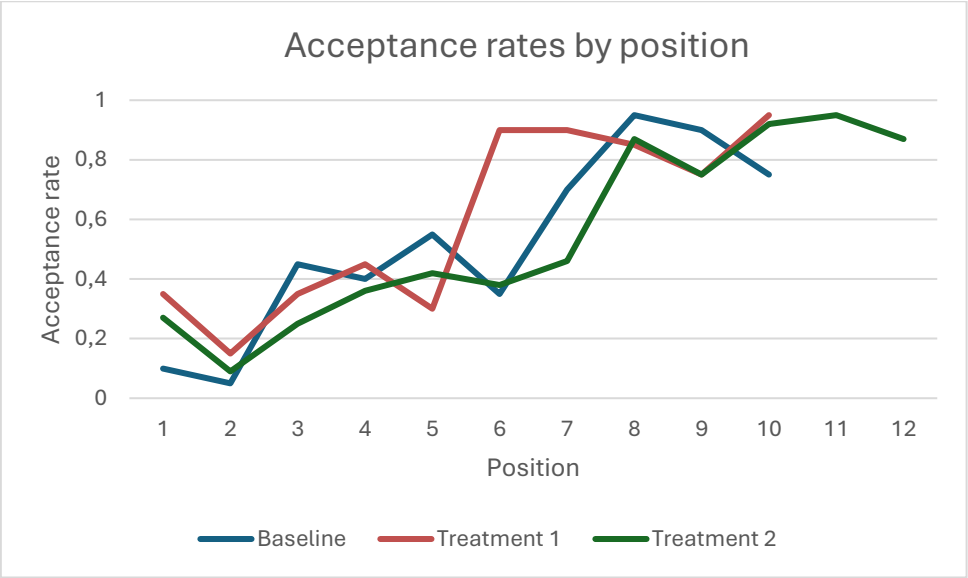

Figure 8: Acceptance rates of the different variations sorted by position

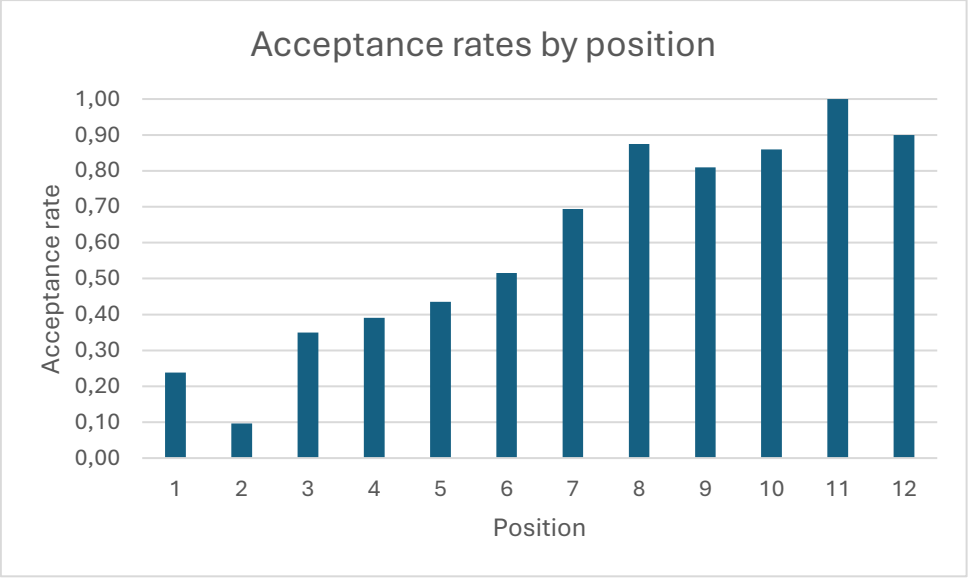

Figure 10: The average acceptance rates of all variations across rounds.

5.2.3 Acceptance Rate by offered Round

In the following graphs, the development of the acceptance rate is shown, with the first 5 and the last 5 rounds of each respective treatment being considered. In the final variation, rounds 6 and 7 were excluded for comparison purposes.

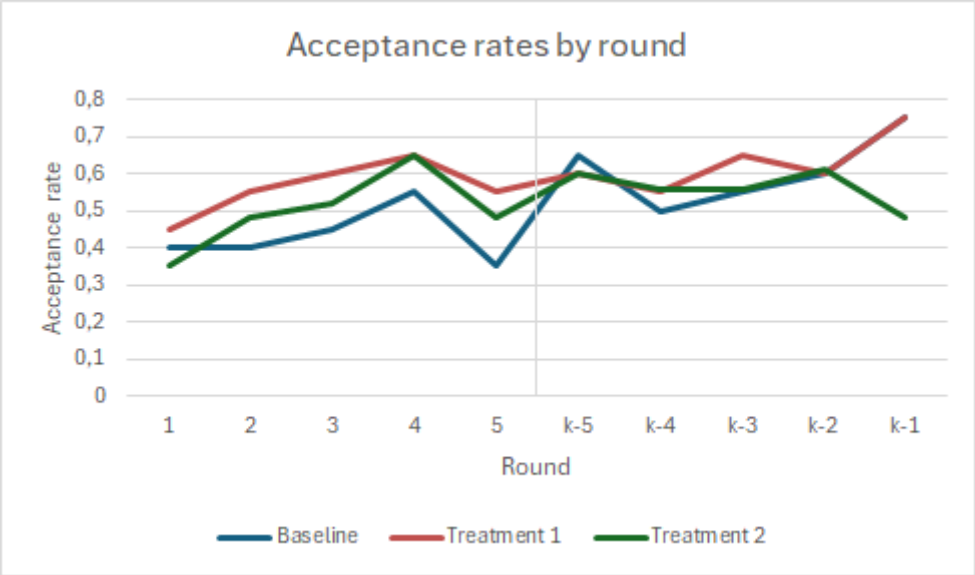

Figure 11: The average acceptance rates of all variations across rounds, with k being the number of rounds

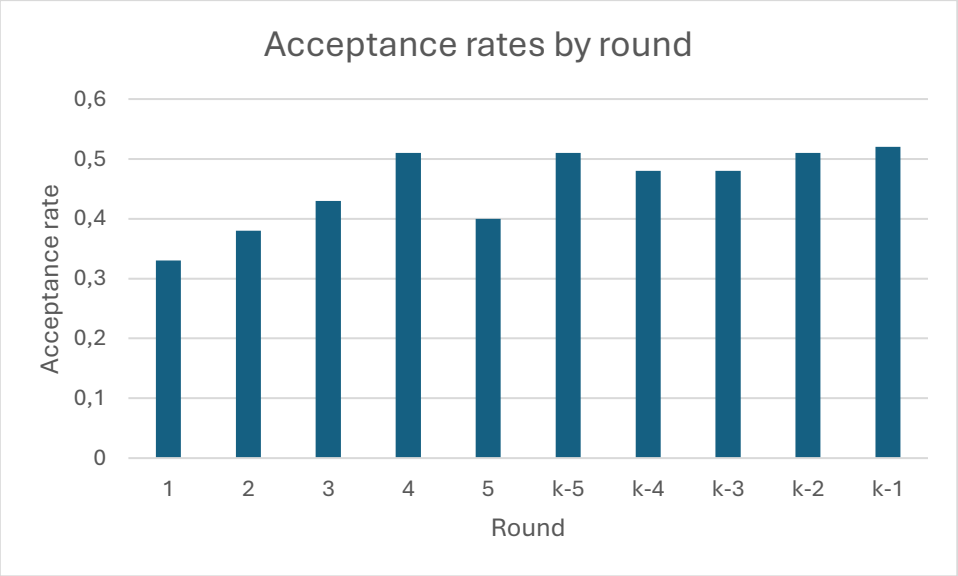

Figure 12: The average Accpetance Rates of all variations across rounds

5.3 Demograpic Data

This section presents the demographic data of the participants and their respective acceptance rates.

5.3.1 Nationalities

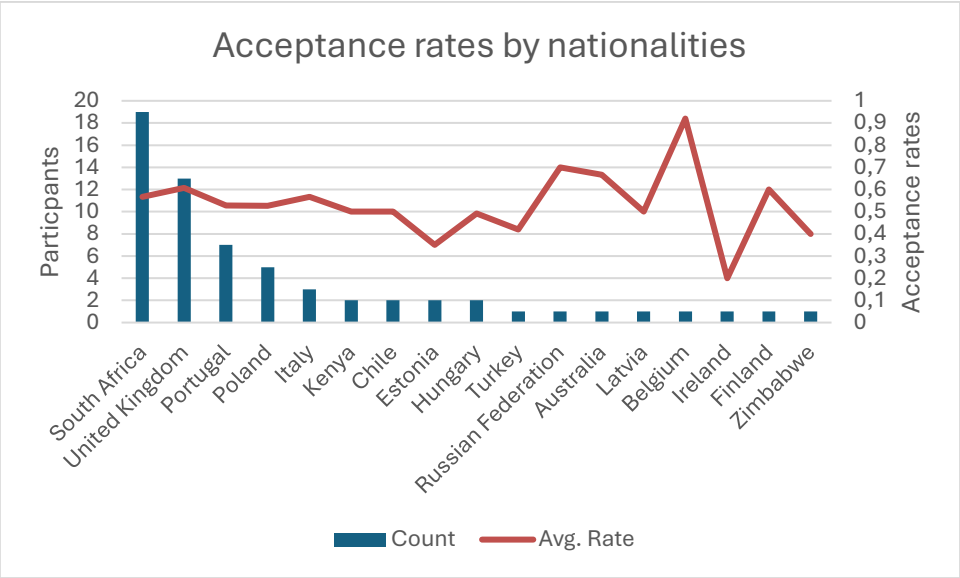

Figure 13: Number of participants from each country and their average acceptance rates

It is noticeable that participants primarily came from South Africa and the United Kingdom, and that mostly countries in a similar time zone participates.

5.3.2 Age

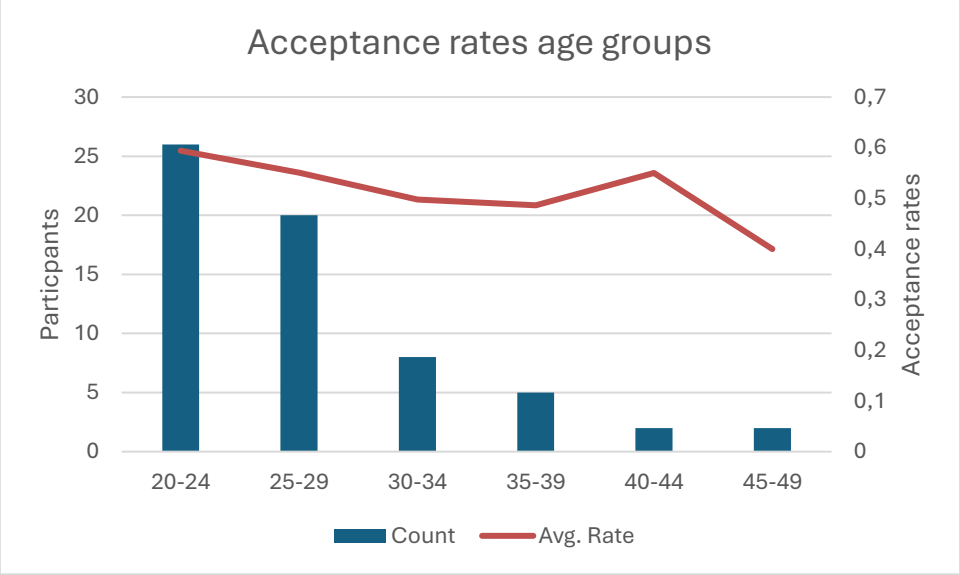

Figure 14: Acceptance rates grouped by age

For this graph, the participants were grouped by age. The average age of the participants was 28 years.

5.3.3 Gender

This graph shows the distribution by gender, with one person not having provided this information in their Prolific-profile.

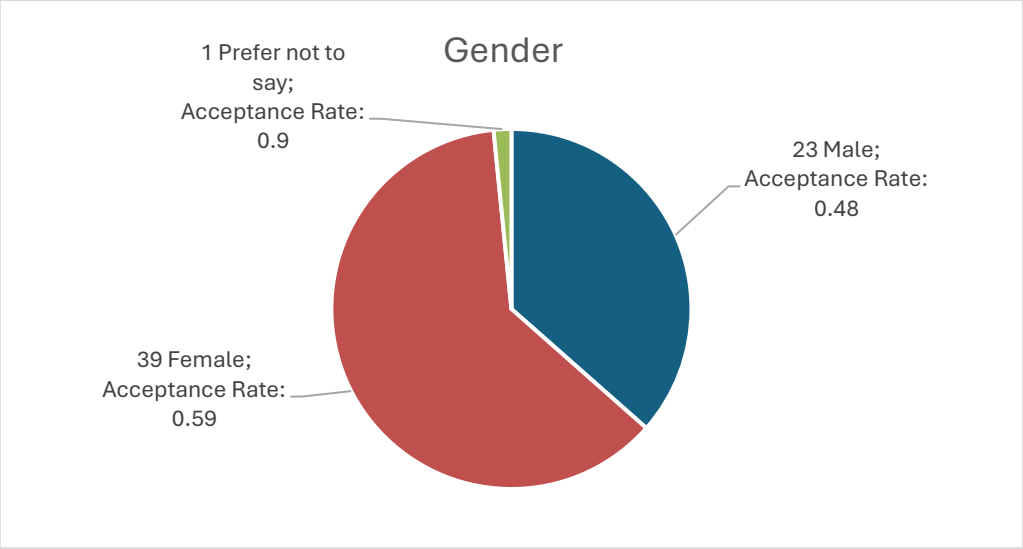

Figure 15: Acceptances rates and numbers across genders

5.3.4 Student Status

The last graph shows the distribution between students and non-students, with two participants not having provided any data on this.

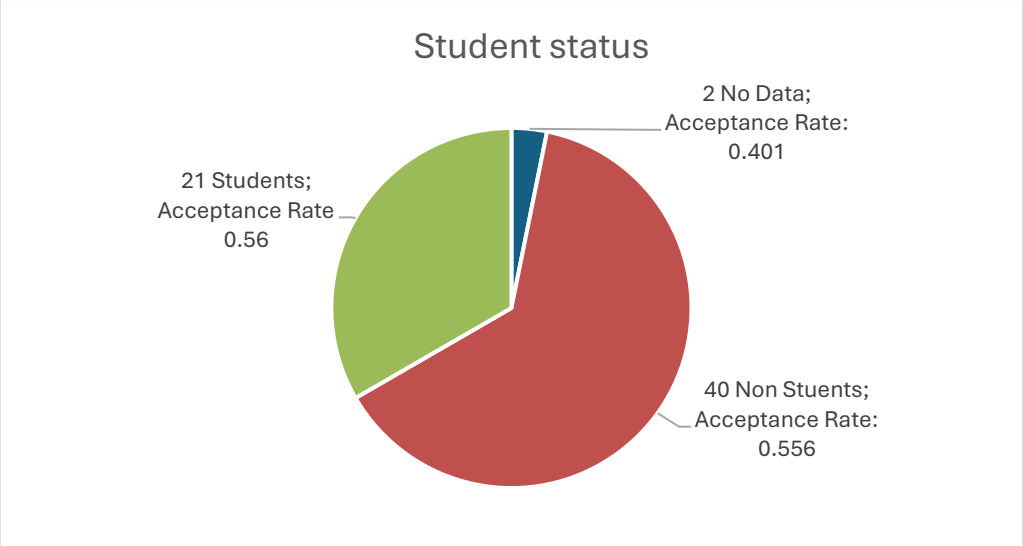

Figure 16: Acceptance rates and numbers across student status

5.3.5 Controll Questions

The control questions, as shown in Figures 19 and 21 in the appendix, serve as a simple check to determine whether the participants correctly understood the game. The results were, that during the first attempt, Question 1 was answered correctly by 76% oft he particpants, while Question 2 was answered correctly 83% of the time. After their response, participants were informed whether they were right or wrong, and an explanation was provided. If they answered the questions incorrectly, they were given a second chance. Of those who answered Question 1 incorrectly the first time, 73% got it right on the second attempt, and a similiar percentage was observed for Question 2. Since the participants received another explanation after giving the second wrong answer, the survey was deemed sufficient to assume that the participants largely understood the game.

5.4 Results of the Hypothesis testing

In this section, the hypotheses presented are examined based on the results.

5.4.1 Null Hypothesis 1

There is no specific amount at which participants are more likely to accept rather than reject the offer, with $p \leq 0.5$.

While p is the actual acceptance rate in the population. A one sided-bionomialtest cheks that the propability, that the acceptance Rate to accept is lower than 50% for a certain value. Please note that the p-values 1.0000 and 0.0000 are not exact but have been rounded.

value	$0.03	$0.06	$0.12	$0.24	$0.48	$0.96
p-value	1.0000	1.0000	0.994	0.9997	0.8129	0.9836

Table 1: p-values for vales from $0.03 to $0.96

value	$1.92	$3.84	$7.68	$15.36	$30.72	$61.44
p-value	0.5505	0.0000	0.0000	0.0000	0.0000	0.0000

Table 2: p-values for vales from $1.92 to $61.44

The tests yielded extremely low p-values for the values $3.84 and the following, indicating that the likelihood of the observed acceptance rates occurring by chance under the assumption of a 50% acceptance rate is exceedingly low. Therefore, we can reject the null hypothesis for these positions and accept the alternative hypothesis, that there is at least one value where the acceptance rate is greater than 50%. So, in fact these values are $3.84, $7.68, $15.36, $30.72 and $61.44. Therefore, $3.84 is the value at which point individuals are more inclined to accept than reject an offer, favoring their personal gain over the potential greater common good.

5.4.2 Null Hypothesis 2

There is no significant correlation between the number of rounds played and the acceptance rate.

To test this, the average acceptance rates during the different rounds are compared. Due to the fact that the last treatment has 12 rounds and not 10, the first 5 rounds and the last 5 rounds are compared with each other. The Pearson correlation shows a positive correlation of 0.801, with 1 being the maximum. The test gives a p-value of 0.0054, which is significantly smaller than the significance level of $\alpha=0.05$. Therefore, we would reject the null hypothesis and accept the alternative hypothesis. This means that there is sufficient evidence to conclude that a significant linear relationship exists between the round numbers and the acceptance rates. In numbers, it's a total increase of 3.85% per round.

To test for demographic patterns, we use a linear regression model, which allows us to group the participants by each session, as they are not independent of each other.

Surprisingly, the group variance of the sessions was surprisingly low, with a group variance of 0.000287, indicating that there are no big differences between the groups. The first hypothesis to be tested was the following:

5.4.3 Null Hypothesis 3

There is no significant difference in acceptance rates between women and men.

The analysis yielded the following results: At 48%, men had a 10.6% lower acceptance rate than women, who had an acceptance rate of 58.6%. This is in contrast to the hypothesis. However, this difference is not statistically significant as the p-value of 0.066 is just above the significance level of $\alpha=0.05$ and so the alternative hypothesis cannot be rejected. There is therefore no statistically significant difference in the acceptance rate of women and men.

5.4.4 Null Hypothesis 4

There is no significant difference in acceptance rates between students and non-students.

The Linear Regression Model concludes that with a p-value of 0.94 there is no statistically significance in the difference in acceptance rates between students (55,97 %) and non-students (55,53%).

5.4.5 Null Hypothesis 5

The acceptance rate decreases as participants' age groups increase.

The model results show that the coefficient for the age group is -0.033, indicating a slight decrease in the acceptance rate with increasing age. The negative coefficient suggests that with each increase in age group, the acceptance rate decreases by about 3.3%.However, this effect is not statistically significant ($p = 0.125$), indicating that the hypothesis cannot be clearly confirmed with the available data.

5.5 Discussion of Results

In this chapter, the results of the hypothesis tests are placed in the context of theoretical expectations and existing literature

5.5.1 Value Acceptance

In figure 6, it can be seen, that, regardless of the variations, the acceptance rate shows its strongest change between the values of $0.48 and $3.84. The binomial test revealed that starting from a value of $3.84, the actual acceptance rate in the population is almost to a 100% above 50%.

However, the binomial test has some limitations, particularly the assumption that the observations should be independent. Here, we have two important dependencies, largely ignoring demographic factors: firstly, the dependency within groups, and secondly, the dependency between rounds. While we could simulate the group dependency as a categorical variable and the round as a continuous variable using a more in-depth model, the variance between the groups in the linear regression model has shown that it is close to zero. The dependency on the rounds, which was proven to be significant, seems to be more important. However, the question remains as to which round is the most appropriate for making a general statement about the acceptance rate.

On the one hand, the first round is independent, but it may include strategic effects that could distort the willingness to act altruistically. In the last round, we observe the endgame effect, which we actually want to investigate since it eliminates long-term personal effects. However, we also have learning effects, reciprocal behavior (both positive and negative), and possibly the fatigue effect.

Since the actual acceptance rate is mostly positively influenced at the beginning and tends to be negative toward the end, it still seems reasonable to perform the binomial test without these dependencies, so it automatically works with an average across the rounds.

The fact that the p-value for $3.84 is almost 1 and for the previous p-value of $1.92 is 0.55 suggests that the desired value is likely within this range.

5.5.2 Round Acceptance

A positive correlation between the number of rounds and acceptance rates has been proven. This correlation aligns with the existing literature under the assumption that strategic, learning, endgame, fatigue, and reciprocity effects negatively influence acceptance rates over time

5.5.3 Gender

Based on findings from primary sources, such as the Dictator Meta-Analysis, one would expect men to have higher acceptance rates. However, this is not the case in this experiment. Interestingly, the data suggest the opposite of what has been found in the literature so far. It is important to note, however, that the results are not statistically significant due to the small sample size. With a sample size of 63, it is difficult to demonstrate significant differences between men and women. Nevertheless, the data show an interesting effect that was not expected in this way.

5.5.4 Student Status

It is noteworthy that the acceptance rates between the different groups are almost identical. This contradicts the findings in the literature, which suggest that students tend to act less altruistically and more profit-oriented compared to non-students in experiments such as the Dictator Game. This observation could indicate that the behavior of students and non-students in certain contexts converges more than previously assumed, possibly due to external factors such as social environment or economic pressures.

5.5.5 Age

A negative correlation between the age of participants and acceptance rates can be observed, but it is not statistically significant. This finding does not align with the literature, as seen in the Dictator Game or other studies, where the negative correlation was significant. However, the data and analysis still point in the same direction.

6. Discussion

In this section, a deeper interpretation of the results will be provided, and implications for theory and practice will be derived.

6.1 Interpretation

6.1.1 Value Acceptance

The value of $3.84 was verified in the experiment as the threshold at which selfish preferences outweigh the benefit for the greater good. Although this value is influenced by various factors, the relatively high acceptance rate suggests that the actual tipping point likely lies between $3.84 and $1.92. This contrasts with the payouts typically seen in social media experiments, which range from 50 to 200 dollars. From this, it can be concluded that only a small portion of individuals' altruistic behavior in the social media trend can be attributed to pure altruism. A large part is likely influenced by the desire to be perceived as altruistic.

It should be noted, however, that the participants entered the experiment with a different intention than those who were randomly surveyed in shopping malls, who had no expectation of earning money. The high average participation rate of our participants in previous surveys on Prolific—almost 200—suggests that people probably do not use the platform just for entertainment, but also with the intention of earning money. While this expectation is partially compensated by a relatively fair base pay of 12 dollars per hour, it cannot be entirely eliminated.

Moreover, there may be a significant difference between whether a majority would take a sum or whether they would pass it on. The available data show that, if we want to continue with a significance level of $\alpha = 1\%$ and account for various dependencies within the rounds to determine the amount at which the majority would likely pass, we need to consider the negated p-values (1-p) from the binomial test in table 1 and 2 for acceptance rates. Therefore, we can conclude that only for values below $0.24 is the acceptance rate relatively certain to be under 50%.

Can a value be derived from this, for example, as a suggestion for donations? Only to a limited extent (Trope, o. J. , 2023) because donations represent not additional gains but the loss of money already in one’s possession. Prospect Theory makes a

significant distinction here: the perceived loss of money feels more impactful than simply not gaining more (Kahneman & Tversky, 1979).

Additionally, it makes a difference whether the recipient is known (Hoffman et al., 2000). If the donation is for a well-researched cause or organization, the willingness to donate is likely to increase (Trope, o. J., 2023). However, the experiment shows that people are probably willing to contribute amounts up to $0.24 for altruistic reasons. $1.92 appears to be a critical threshold, as this amount was accepted 50% of the time. At $3.84, selfish preferences clearly begin to outweigh altruistic ones. The average earnings of 70 cents per person per round, however, indicate that despite the high payout possibilities, participants were not able to fully capitalize on these opportunities.

6.1.2 Round Acceptance

On the one hand, strategic effects at the beginning of the experiment could distort the results. Players may not increase the payout amount for altruistic reasons but rather to benefit from a generally lower acceptance rate in later rounds when they hold a higher position. Consequently, one could argue that only the last round is truly altruistic, as it is less influenced by these strategic considerations. However, the last round is also shaped by the learning effects accumulated from previous rounds.

Since participants are only aware of the earliest accepted position, and each person has a different intrinsic acceptance threshold, the acceptance rate of the first person to accept tends to be perceived as the standard. This can legitimize lower rates, which then become the new norm, subsequently influencing the overall structure of the game and participants' decisions.

In summary, it can be assumed that participants are initially motivated, but alongside altruistic preferences, they also consider strategic factors. Over time, however, these effects diminish, and learning processes, fatigue, as well as endgame effects, lead to decreasing acceptance rates. Additionally, there may be a certain level of disappointment regarding the acceptance rates of others as the rounds progress. Therefore, to draw conclusions about the altruism of the population, it seems reasonable to consider the averages across all rounds.

6.1.3 Position Acceptance

In the results of the investigation into positions, no significant difference in acceptance rates between the various positions can be observed, with the exception of a notable difference between the first and second positions. So there seems to be reatively Strong incentive to Accept an value just because people are in the first position various possible explanations can be suggested for this phenomenon:

The Appeal of winning itself could be decisive-some people might simply want to win, especially if the game spans multiple rounds and they haven't had much luck so far, espically getting an easy win that is a 100% safe. Some participants might be suspicious of the experiment and want to test whether the mechanics actually work as described. By accepting the first position, This is the only time where they can be sure that they should win and therefore is the best position to test it. They might also see it as a form of punishment to express their dissatisfaction with the previous round.

It is worth noting that no individual, not even those who accepted values in the first position, had a total 100% acceptance rate. This suggests that acceptance rates do not follow a consistent rule but are made intuitively. This is a perfect example of fast thinking, as explained by Kahneman and colleagues (Krämer, 2014) .

Interestingly, there is a relatively linear increase in acceptance rates between positions seen in figure 10, even though the corresponding amounts increase exponentially. This suggests that both the previously disclosed number of positions and the range of amounts strongly influence the decision-making process of the participants. These observations might indicate that decision-making behavior is not solely influenced by the monetary incentive, but also by the structure and context of the decision itself. This cocluison fits into the existing literature on monetary incentives (C. F. Camerer & Hogarth, 1999).

6.1.4 Demographic Acceptance

The experiment was conducted globally, but since Europe and Africa are in the same time zone and these continents were the most active during the time the experiment was conducted, we predominantly had participants from Africa and Europe, where different moral beliefs may have influenced decisions. The "true value" of a certain amount for an individual could also be a decisive factor. For example, when comparing the two most common nationalities in figure 13 — the United Kingdom and South Africa

— it is noticeable that the United Kingdom has a higher average acceptance rate (61% vs. 57%). This is surprising, as one might have expected the acceptance rate to be lower in the United Kingdom due to its much higher minimum wage (7 to 8 times higher).

6.1.4.1 Gender

In the existing literature it is observed that women act more altruistically. However, the experiment suggests that there is indeed a difference, although this is not statistically verifiable due to the small sample size. The variable of social identifiability may have a significant impact on individual behavior, particularly for women. There is a societal expectation that women act more altruistically than men (Eckel & Grossman, 1998).

However, since the experiment was conducted online, individuals are no longer identifiable, which could reduce the adjustment to this expectation to a minimum. As a result, altruistic behavior might decrease as the perception by others is absent in the nearly anonymous online environment. Since the expectation of altruism is higher for women, reducing identifiability could have a greater impact on their behavior.

6.1.4.2 Student Status

In our dataset, there is practically no difference in acceptance rates between students and non-students. This may be because students in the existing literature, who participated in university experiments, tend to be more financially dependent than other individuals who participate in such experiments online. So the fact that these experiments were not conducted in a university setting may have led to a leveling of financial needs between the two groups.

6.1.4.3 Age

There is no clear evidence that older people act significantly more altruistically in our experiment. However, there is a strong indication of this, which falls just outside the significant range. A larger population would likely have yielded significant results and could potentially extend the applicability of the existing literature's findings to digital spaces.

6.2 Limitations

There are several methodological limitations and challenges that must be considered when interpreting the results of this experiment. First, market-driven societies tend to behave differently than less market-oriented cultures. Attitudes toward accepting gifted items vary significantly across cultures. In some societies, accepting gifts is considered morally wrong, while in others it is viewed as completely acceptable (Oosterbeek et al., 2004). These cultural differences can have a significant impact on the experiment's outcomes and limit the generalizability of the findings to other cultural contexts. We had participants from various parts of the world, each with different moral beliefs. Additionally, factors such as societal expectations around fairness and reciprocity could have subtly influenced the decisions, which raises further questions about the role of context in shaping behavior.

Second, the sample size in this experiment was relatively small, which can significantly affect the statistical power of the results and introduce biases. A small sample size makes it challenging to draw reliable conclusions about the broader population, thereby limiting the external validity of the experiment.

Moreover, the assumptions for the statistical binomial test are not entirely correct, as we identified dependencies within the rounds. Additionally, the control questions revealed that participants were not fully focused; conducting the experiment from home led to distractions and inattention. This controlled lab environment is only partially applicable to real-world scenarios. The short decision times of just a few seconds indicate that rapid decisions tend to be more emotional, which may lead to different outcomes in real-life situations.

6.3 Further Research

For future research, several interesting approaches could help develop a deeper understanding of the underlying mechanisms and more accurately determine the tipping point X, where egoistic preferences overcome altruistic ones in different social contexts.

One approach could involve experimenting with different starting values to discover how they affect the determination of amount X. By varying the initial amounts, more precise insights could be gained into how this value is perceived across different social groups and contexts.

Furthermore, we observed that participants were influenced by their positions. It would be interesting to see how their behavior changes if they were unaware of the position they had taken. Specifically, it would be fascinating to investigate whether a linear trend in acceptance rates over values would occur under such conditions.

Another intriguing aspect would be to remove the anonymity boundaries in the experiment in order to quantify shifts in participant behavior. By comparing anonymous and non-anonymous conditions, we could better understand how strongly social identifiability influences altruistic behavior and how much the willingness to donate is affected when the recipient's purpose is known. Moreover, it would be interesting to see not only how acceptance rates change when the anonymity of the recipient is altered but also when the anonymity of the decision-maker is modified.

Conducting the experiment in different cultural contexts would also be valuable to measure cultural differences in decision-making and altruism. Different societies have distinct norms and expectations that influence behavior in such experiments.

Additionally, it could be insightful to directly interview participants to understand the reasons behind their decisions. Specifically, it would be valuable to investigate why some participants make inconsistent decisions, such as choosing to accept in the first position but pass in the second. Such qualitative analysis could provide valuable insights into the psychological and social factors that shape behavior in these situations.

By combining these approaches, future research could contribute to a better understanding of the mechanisms that drive altruistic behavior and expand the applicability of findings across various social and cultural contexts.

7. Conclusion

Overall, we concluded that the acceptance rate becomes reliably higher than 50% at $3.84. At $1.92, exactly half of the participants indicated they would accept the money. The average payout was 70 cents, and only below 24 cents we can be relatively sure that the acceptance rate is below 50%. From these results, we can infer that the social media game, which typically ended with amounts between $50 and $200, is strongly influenced by additional factors, including the desire to be perceived as altruistic. It is important to note our participants may have entered the game with the intention of maximizing their earnings, making it difficult to draw strong conclusions about altruism in society. The evaluation by position resulted in a relatively linear acceptance rate, whereas logically it should have been exponential, indicating that participants were strongly influenced by the position and framing of the experiment. Interestingly, the acceptance rate in position one was nearly three times higher than in position two. It was found that participants were 3.8% less likely to pass on the amount with each successive round. Significant demographic results could not be derived, but there were indications that women accepted an amount more often than men, which contrasts with the existing literature. Students accepted as frequently as non-students, and there was indications that older individuals made more altruistic or cooperative decisions than younger people.

8. Apendix and References

8.1 Appendix

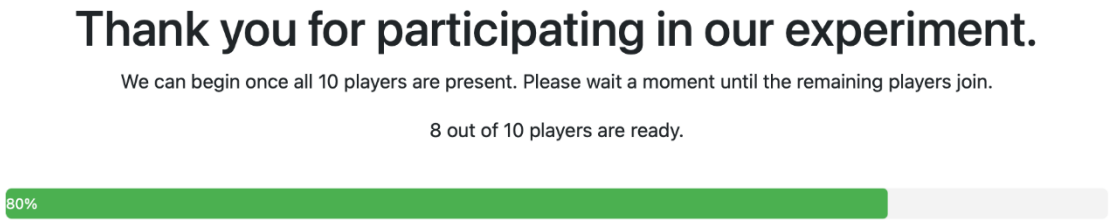

Figure 17: Stall Screen

Instructions

Take it or double it and give it to the next person.

Welcome to our economic decision-making experiment. In this game, you will interact with other people and make decisions that determine your payout.

Gameplay:

Role Assignment:

- You will be randomly assigned a position from 1 to 10.
- Depending on this position, you can receive a payout.
- The first person is offered 0.03 dollar, and each subsequent person is offered double the previous amount, up to the 10th person who is offered 15.36 dollar.
- Here is a full table with the offered Payouts:

1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
0.03	0.06	0.12	0.24	0.48	0.96	1.92	3.84	7.68	15.36

Round Procedure:

- First, you will learn your position for this round and the amount of money offered to you.
- You can either accept the offered amount of money or "pass it on."
- The first position that accepts the money gets the payout. All others get nothing this round.
- The game is played for 10 rounds. Each round, all players are assigned a new position and thus a different payout offer.

Example:

In one round, all players decide to pass the money except for positions 4, 6, and 9. They decide to accept the money. In this case, only position 4 gets the payout because it was the first position to accept the money. The other players will learn that position 4 received the money, and a new round with new positions will begin.

Important Notes:

- There is no communication between players during the game.
- The decisions of the players are anonymous, and the other players will only learn at which position the money was first accepted, but not by which player.
- Please stay for the entire duration of the experiment, even if you have to wait for the other players at times.

Objective:

The objective of this experiment is to analyze the decisions on when an amount is kept for oneself and when an amount of money is rather passed on to others.

Next

Figure 18: Instructions

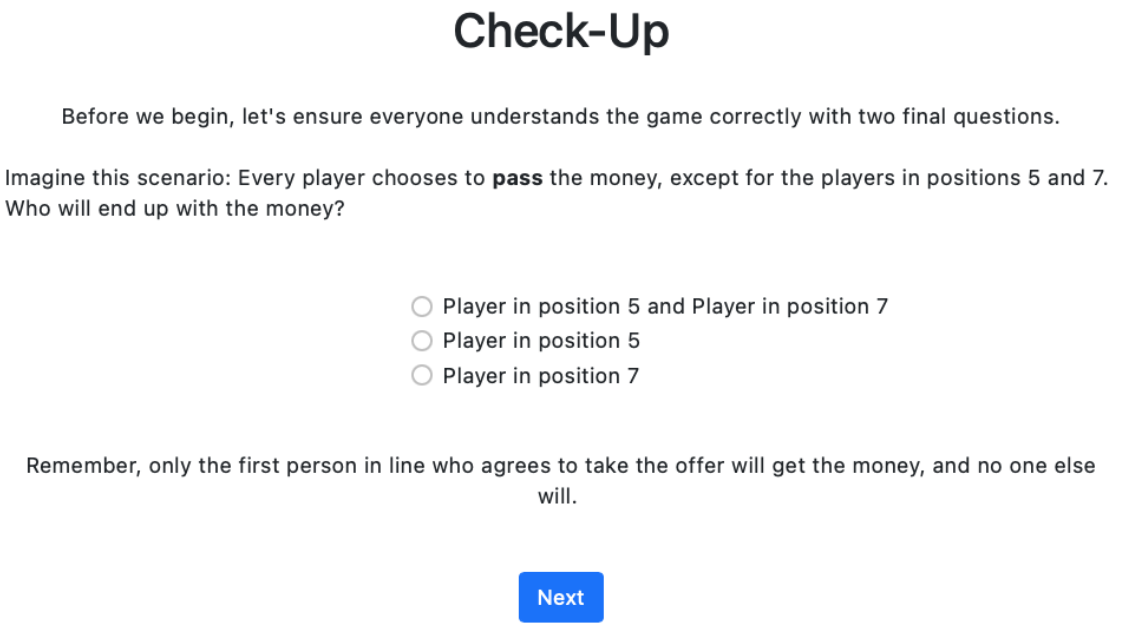

Figure 19: First Check-Up Question

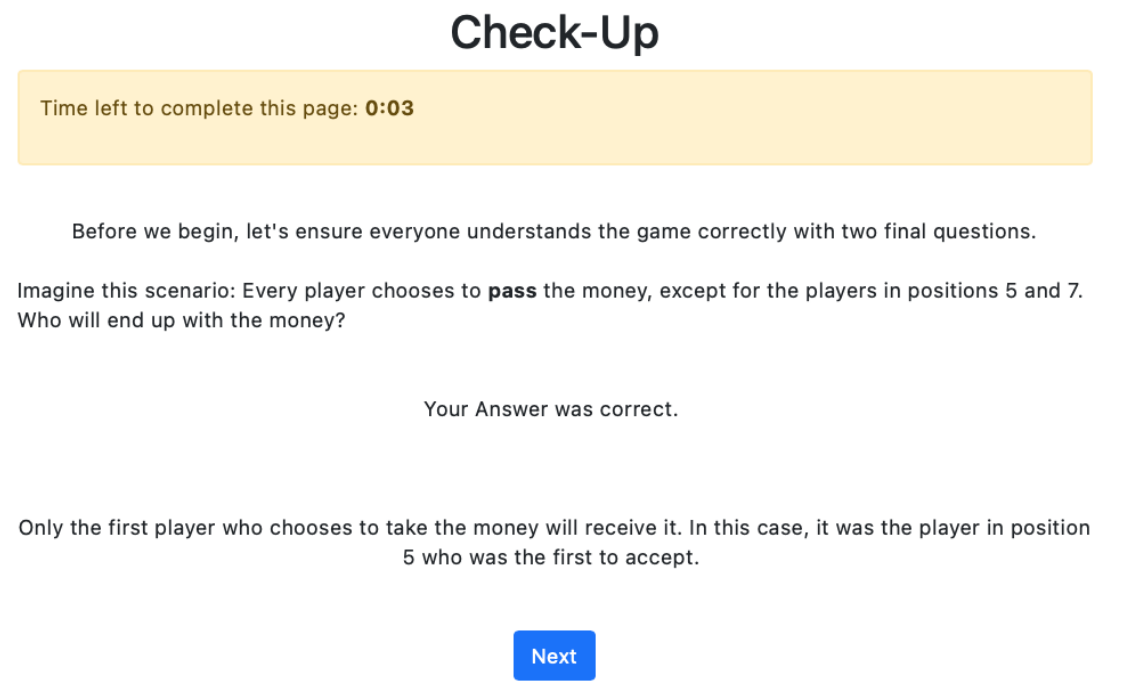

Figure 20: Answer Reveal and Timer

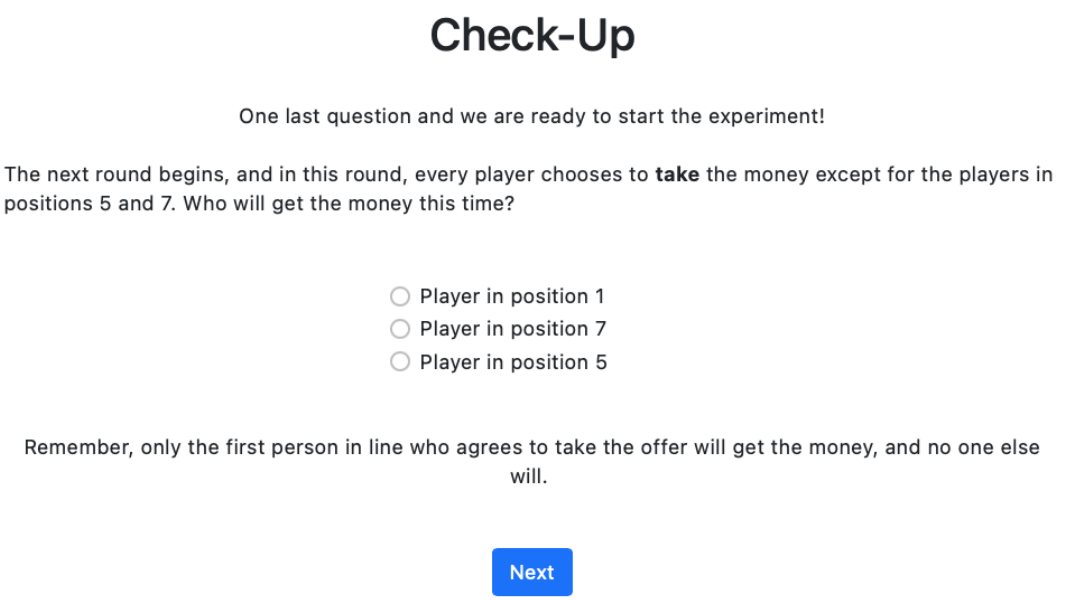

Figure 21: Check-Up Question 2

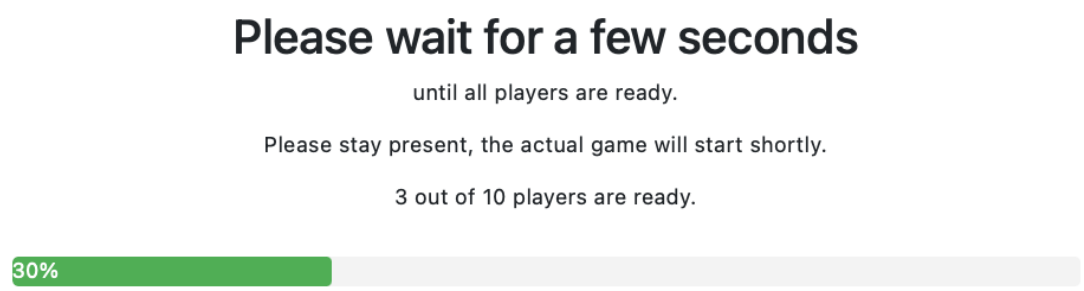

Figure 22: Waiting Screen for the Actual Experiment

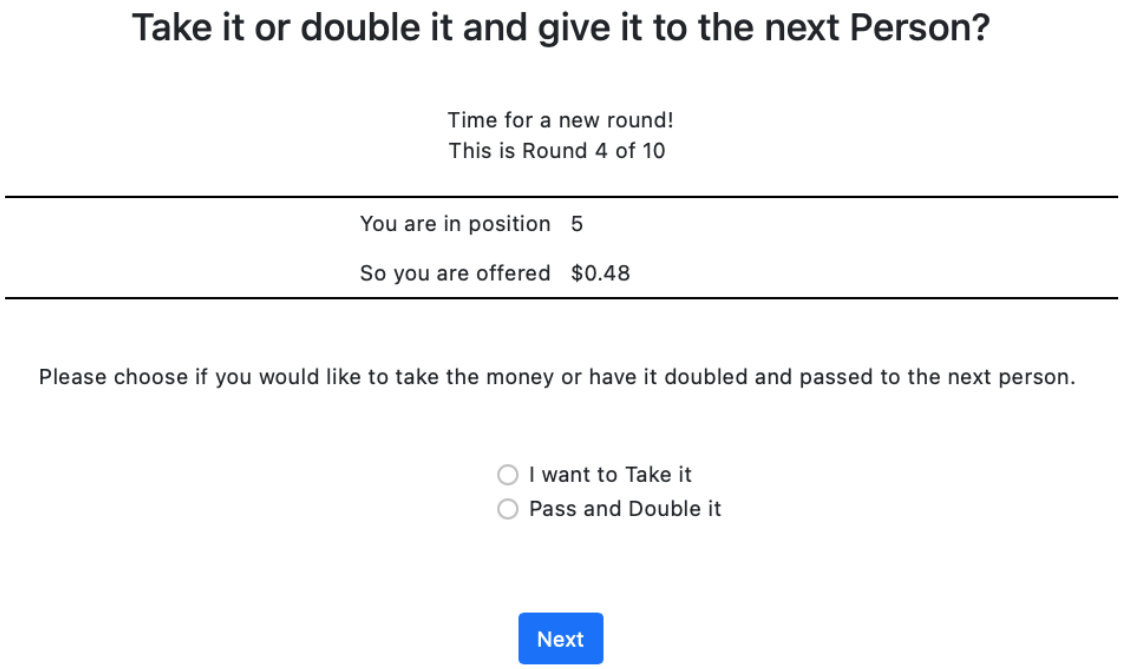

Figure 23: Decision Screen

Figure 24: Waiting Screen for Decision-Making

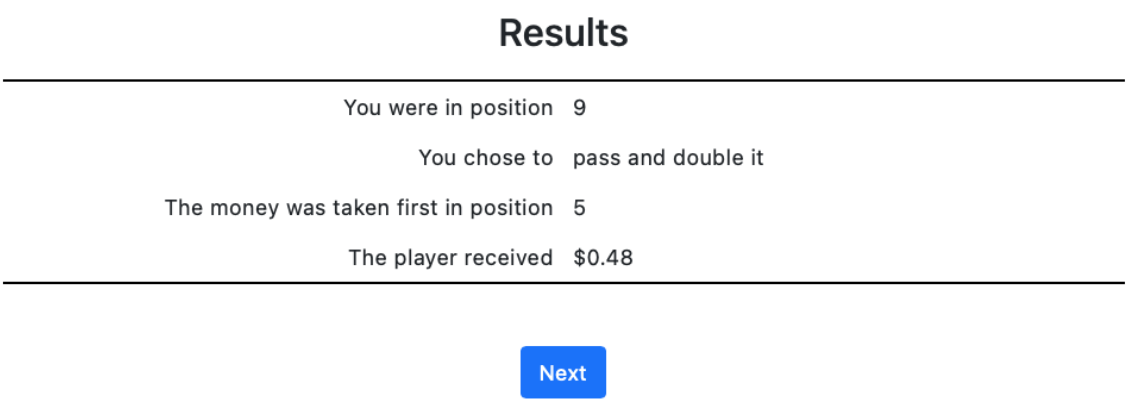

Figure 25: Result Screen

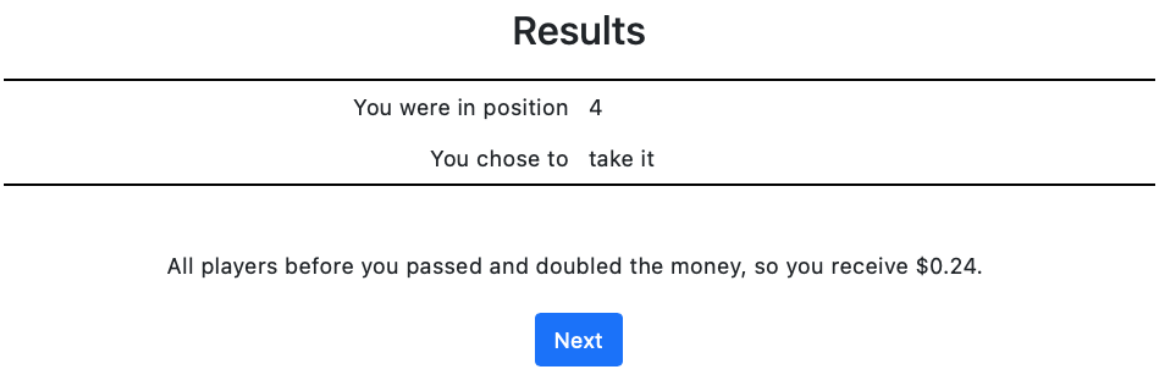

Figure 26: Result Screen of the Winner

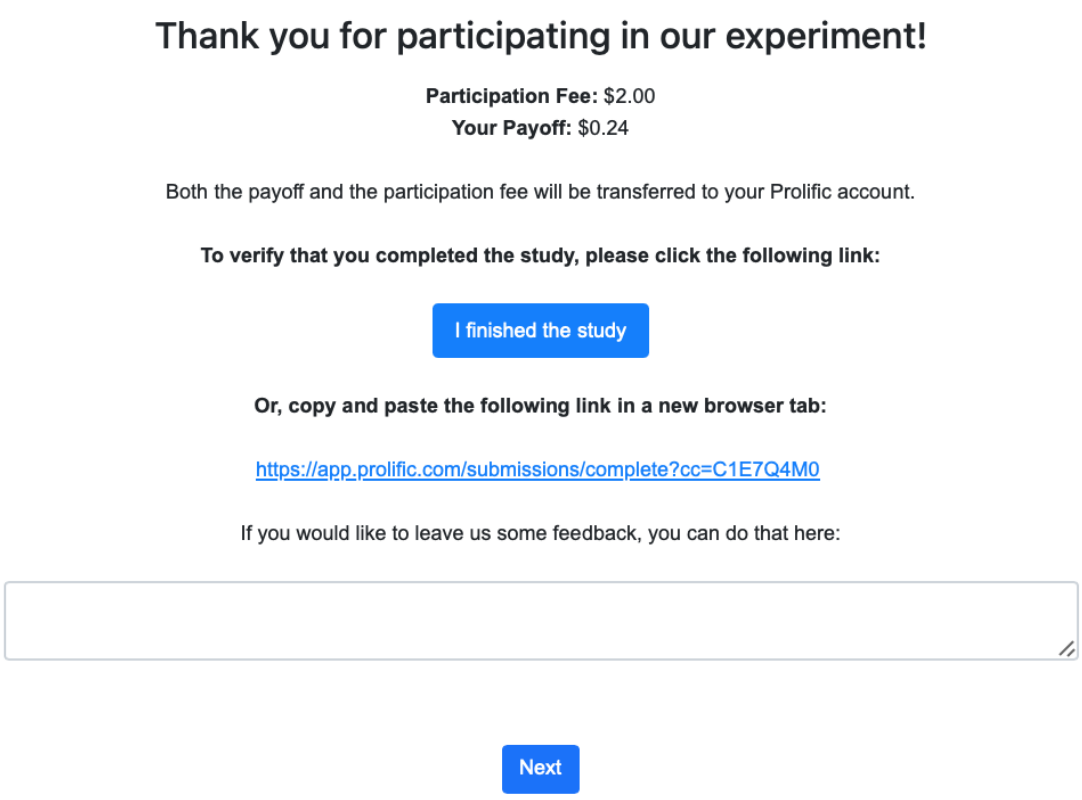

Figure 27: End Screen

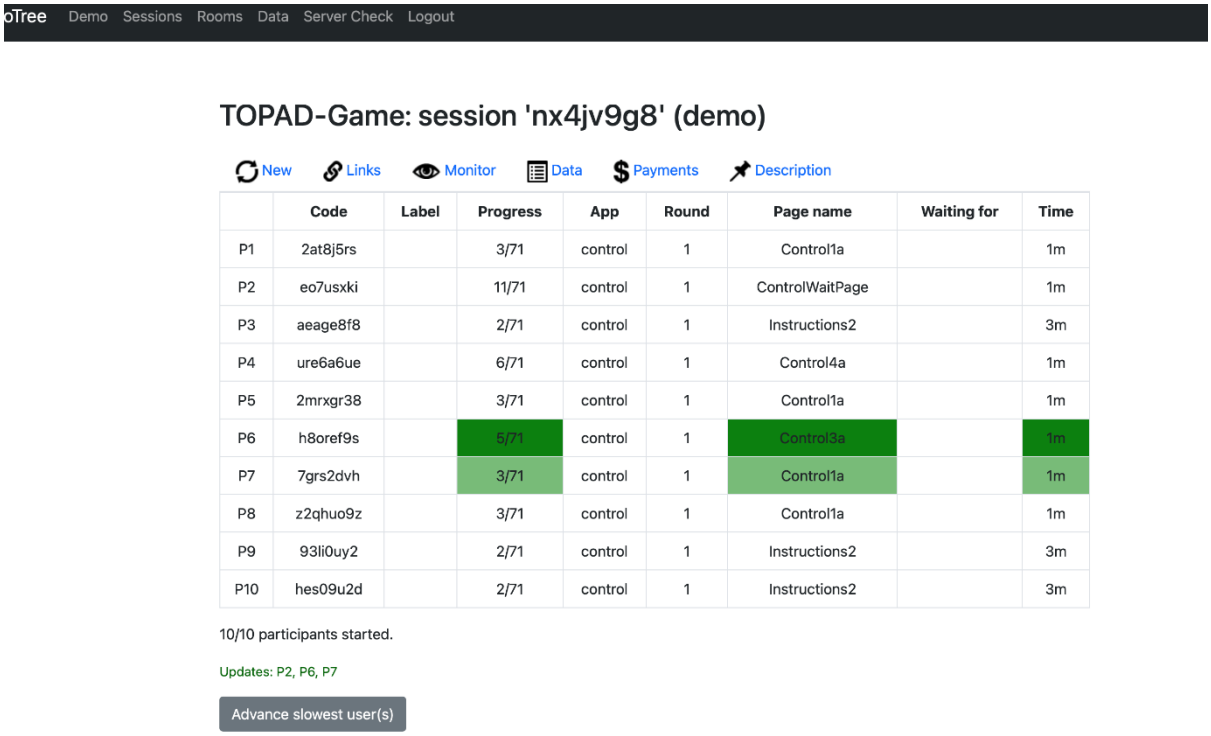

Figure 28: Admin Interface

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8.3 Statement on the Use of Artificial Intelligence (AI) in This Master's Thesis

In this master’s thesis, artificial intelligence (AI) was partially utilized to support the writing process and data analysis. The following specific areas were assisted by AI technologies:

1. **Text Assistance**: The Grammarly-AI was employed to provide suggestions for improving spelling, grammar, and structure. These suggestions were manually reviewed and, where appropriate, integrated into the thesis.
2. **Coding**: The ChatGPT-AI was used for certain Code parts in Python, to enhance the efficiency of programming. All results were validated and interpreted by me.

It is important to note that I bear full responsibility for all the content in this thesis. The AI‘s was used solely as a supportive tool to facilitate the working process, with all content-related decisions and conclusions made by myself.

9. Eidesstattliche Erklärung

Hiermit versichere ich, Name, an Eides statt, dass ich die vorliegende Master/Bachelorarbeit mit dem Titel „Titel“ selbständig und ohne fremde Hilfe verfasst und keine anderen als die angegebenen Hilfsmittel benutzt habe. Die Stellen der Arbeit, die dem Wortlaut oder dem Sinne nach anderen Werken entnommen wurden, sind in jedem Fall unter Angabe der Quelle kenntlich gemacht. Die Arbeit ist noch nicht veröffentlicht oder in anderer Form als Prüfungsleistung vorgelegt worden.

(Unterschrift) Berlin, den 07.09.2024