Economic Situations and Social Distance: Taxation and Donation

Alexander M. Brandt

Professor Rachel E. Kranton, Faculty Advisor

Professor Scott A. Huettel, Faculty Advisor

Professor Grace Kim, Seminar Advisor

Honors Thesis submitted in partial fulfillment of the requirements for Graduation with Distinction in Economics in Trinity College of Duke University

Duke University

Durham, North Carolina

2022

Acknowledgements

I am immensely grateful for the funding support provided by the Duke University Undergraduate Research Support Office, the Charles Lafitte Foundation Program in Psychological Research at Duke University, and Professor Rachel Kranton. This support allowed me to pursue higher impact and larger scale research than I ever imagined, and this work would have been impossible without your generosity.

I would like to extend my gratitude to my two thesis advisors, Professor Scott Huettel and Professor Kranton. Without your time, advice, and support, this work would look nothing like it does today. To Dr. Vicki Lee – thank you for all the time spent discussing my ideas, giving me advice, and assisting me with my data management and analysis over the last two years. Thank you also to Professor Grace Kim for our discussions and your assistance in editing this work from an early stage.

Thank you to Dr. Tyler McFayden and the others who read portions of this document for taking the time to read this long paper and providing your helpful comments and suggestions. To my peers in all my thesis seminar courses – your insights have been invaluable throughout this process. Finally, thank you to my family – Mom, Dad, and Maya – and my friends for always pushing me to pursue my passions and constantly encouraging and supporting me.

This work would have been impossible without all of you.

Abstract

This experimental study evaluated the effects of two common economic situations – taxation and donation – on the social distance between participants in the situations, an original effect of interest that is the opposite of prior research. This study employed a novel survey framework, in which subjects gave money to others in the economic situations and socially judged recipients of their money. Findings mostly did not support predictions that the economic situations would differently affect social distance, but the novel framework enabled an effective test of the effect of economic situations on social distance and is a major contribution to the field.

JEL classification: C91; D64; D89; D90

Keywords: Behavior; Donation; Experimental Economics; Social Distance; Taxation

I. Introduction

Both taxation and charity are key components of the United States (U.S.) economy, and both serve as crucial ways that individuals' wealth is transferred to others. In 2020, Americans gave over $470 billion in general philanthropy, and charitable giving accounted for 2.3% of U.S. gross domestic product (GDP). Individuals have become progressively more focused on charity, with the amount of charitable giving by individuals increasing in five of the last six years (National Philanthropic Trust, n.d.). The top one percent of the income distribution is responsible for about one-third of all charitable gifts in the U.S., and the wealthiest 1.4% of Americans are responsible for 86% of charitable donations made at death (Philanthropy Roundtable, n.d.). Furthermore, in 2020, giving from individuals made up almost 70% of total giving (National Philanthropic Trust, n.d.).

By contrast, in 2020, the U.S. government collected $4.05 trillion in tax revenue, or roughly 18% of U.S. GDP (USAspending DATALAB, n.d.). Forty-six percent of U.S. tax revenue comes from taxes on income, profits, and capital gains (Organisation for Economic Co-Operation and Development, n.d.). Though the distribution of the income tax burden is not as top-heavy as that of charitable giving, the top earners also represent a larger burden of income taxes. In 2019, the top one percent of taxpayers paid almost 39% of income taxes, a larger share than the entire bottom 90% combined (Tax Foundation, January 20, 2022). However, as charity has generated larger transfers of wealth in recent years (National Philanthropic Trust, n.d.), average taxes have been falling across all groups, with taxpayers paying $23 billion less in income taxes in 2019 than in 2017, despite adjusted gross income rising during that time (Tax Foundation, January 20, 2022).

Both taxation and donation are prosocial in nature, as both involve an individual giving their money to others, ideally for the benefit of others. However, donation is a *stronger* prosocial behavior, as it involves an individual *wanting* to give their money to others. A great deal of research has explored prosocial behaviors, but the understanding of the social effects of prosocial behaviors is extremely limited. There is also little research that compares different kinds of prosocial behaviors. To address these issues, the current study compares how situations of donation and taxation differentially affect the social distance between participants. Social distance originates in social psychology and is the level of intimacy or closeness that exists between individuals in social interactions (Hughes et al., 1950, as cited in Wark & Galliher, 2007). In other words, social distance describes how close or similar two individuals are in a given interaction. Thus, the current work investigates how givers of money in two different prosocial economic situations – taxation and donation – feel about recipients of their money.

Most of the work on the relationship between social distance and economic outcomes has explored how social distance affects economic outcomes. The current work is part of an emerging body of work exploring the opposite effect – the effect of economic outcomes on social distance. This work also incorporates charitable giving and taxation to further develop the understanding of social processes involved in economic situations and add greater real-world relevance to these experimental results.

Economics research has long failed to incorporate individuals' sense of self or social perceptions into experimental work that explores individuals' economic interactions. Traditionally, game theory experiments employed to test behavior in economic situations have used complete anonymity among participants, so the resulting conclusions about participant behavior lack full context because of the absence of the social information that is available

during real-world economic interactions. This means that the traditional understanding of economic behavior has failed to include a crucial component of human economic interaction, social information about others (Charness & Gneezy, 2008).

Other fields have long concentrated on individuals' social perceptions. Social distance as a formal concept was being studied as early as the 1920s, when sociologist Emory Bogardus created the simple seven-item Social Distance Scale to measure the social distance between individuals (Wark & Galliher, 2007). In a classic social psychology experiment, Tajfel et al. (1971) found that, when dividing real monetary rewards, people show more favoritism towards their ingroup, or the group of people who are like them according to a chosen definition (the constructs by which ingroups are defined vary across experiments). It is thus known that individuals do take social information into account when interacting with others. Still, though, economics has long failed to incorporate these concepts into research on economic interactions.

Because social distance is a measure of the similarity or closeness between two individuals, it consists of an individual's identity – or their sense of self – and a comparison between one's own identity and another person (Akerlof & Kranton, 2000). In the last 20 years, experimental economics has begun to incorporate these concepts into research. The body of research that now exists has exclusively explored the effect of social distance on economic situations. Generally, this literature has found that, when social distance between a giver and a recipient is lowered, givers tend to act more prosocially towards that recipient. Though it is encouraging that economics research is beginning to include social perceptions like those seen in real-world interactions, this area is still relatively new and is limited in scope. No known work exists that has examined prosocial situations other than donation or the opposite-direction effect – the effect of the economic situation on social distance. Without examinations of opposite-

direction effects and multiple prosocial economic situations, the bidirectional relationship between social distance and prosocial economic situations remains poorly understood.

To address these gaps in the existing literature, the current research uses an experimental study to understand how social distance is affected by two different prosocial economic situations – taxation and donation. This work is part of an ongoing experimental project conducted by Jeanne Hagenbach, Rachel Kranton, and Victoria Lee that also seeks to determine how different economic situations affect perceptions of others and has previously found that economic contexts do affect how individuals perceive each other (Hagenbach et al., 2022). The experimental framework of this study is similar to that used Hagenbach et al.'s (2022) work and allows for a comparison between taxation and donation settings. In the framework developed for this study, subjects answered basic profile items, were given opportunities to earn real money, were either taxed or given the option to donate that money to a recipient who had answered the same profile items, and were asked to rate their social distance with the recipient after seeing the recipient's profile information. This framework allows for an isolation of the effect of the economic situations on social distance because the profile information was displayed *after* the economic setting, meaning that any differences in social distance between the two economic settings found in this experiment were because of the economic situations, rather than having been affected by the social information.

In the context of donation being a *stronger* prosocial behavior than taxation, this study examines two hypotheses: (1) that donation will result in lower social distance than taxation; and (2) that greater amounts donated will lead to reduced social distance, whereas greater amounts taxed will lead to greater social distance. In this way, this work examines social distance in the two different prosocial economic settings, one which involves forced prosocial behavior and one

which involves a choice to act prosocially. These hypotheses are exploratory in nature; although they are loosely built on the existing literature, current hypotheses cannot be fully informed by the existing body of work because all the work that has been done in the area focuses on the opposite-direction relationships from the current study.

By comparing situations of taxation and donation, this work has great relevance to the ongoing real-world debate over taxation versus donation and could add considerable insights into how people feel about the recipients of their money. More broadly, findings from this study can serve as the foundation for a new area of social science research that explores the effects of prosocial economic situations on social perceptions of others. As this novel research area develops, new insights will be incredibly useful for the understanding of the emotional and social components of these economic money transfers.

This paper first presents a discussion of the related literature in the Literature Review. In the Theoretical Framework, some of the relevant theoretical background in the area is described. A description of the data, method, hypotheses, and empirical methodology is presented in the Data and Methodology section. The empirical findings of this study, a discussion of these findings' implications, and limitations are presented in the Results section. Finally, important takeaways and suggestions for future work are provided in the Conclusion.

II. Literature Review

A. Broad Foundations of Prosocial Behavior

a. *Foundations From Psychology*

Previous research has established that individuals act more prosocially towards those in their ingroup (Tajfel et al., 1971), meaning that, when people are closer (as ingroups are inherently socially close), they are more likely to act prosocially towards others. When translated

to a giving context, this conclusion implies that, when people are closer to recipients, they would be more likely to donate to that person. This implication was explored by Small and Simonsohn (2008), who found that individuals are more likely to donate when they are related to or know a victim of the cause to which they are donating.

There may be other psychological factors which influence donation behavior. Psychology has viewed prosocial behavior as contrary to humans' basic instinct of self-interest, and research has suggested that prosocial behavior requires additional cognitive resources to overcome the instinct of self-interest (Zaki & Mitchell, 2013). However, Zaki and Mitchell (2013) conducted a review of recent literature in the area and found that prosocial behavior may instead be an intuitive act. This result is supported by conclusions from a meta-analysis and original experiment by Fromell et al. (2020) which found no evidence to support the idea that individuals spend cognitive resources to override their intuitive impulse when performing altruistic behaviors. These results have important implications for understanding donation behavior, as prosocial altruism may be an instinct, though further work is required in this area.

Additionally, individual differences may contribute to giving behavior, especially in determining choices to donate to certain causes. For example, giving to arts or cultural charities has been positively associated with level of employment and socioeconomic status (Wiepking, 2010, as cited in Sneddon et al., 2020).[1] Though the current work does not directly explore individual differences, they may be used to explain the results of this work.

b. *Foundations From Economics*

In terms of understanding donation behavior on a broader level, the most influential economics contribution comes from Andreoni (1989). In this classic work, Andreoni (1989)

[1] A comprehensive list of individual difference effects can be found in Sneddon et al. (2020).

suggested that donors get utility from the output of their donation (i.e., the public good output of a charity), but they also get a *warm glow* from the act of giving. This *warm glow* is a private good experienced by the individual who gives the donation (Andreoni, 1989). This suggests that, even if there is not necessarily a clearly defined public benefit that results from the donation, the individual may still donate because of the private benefit that they gain from the act of donating.

B. Dictator Games and Social Distance

The contributions from the economics literature that best inform the current work come from the use of dictator games to explore donation situations. Dictator games are commonly used economic game frameworks and are generally used in experimental economics research to explore fairness (Hoffman et al., 1996). The basic set-up of the dictator game is simple: one participant is endowed with (or, more recently, earns) money and must allocate the money between themselves and a counterpart. The counterpart is forced to accept the outcome of the game, meaning that the burden of fairness lies entirely with the giver (Hoffman et al., 1996).

Clearly, the dictator game resembles real-world donation situations, in which an individual must decide how much money to give to others, and thus is also commonly used to simulate donation situations. However, all the work using dictator games to explore relationships between donation and social distance explores how social distance affects game outcomes and has not yet explored the opposite effect (i.e., how the economic game outcome affects social distance).

According to standard economic theoretical assumptions of rationality and self-interest, a dictator should keep 100% of their money and give nothing to the recipient. However, in practice, only about 40% of dictators keep all the money they are allocated. Therefore, there must be other factors – likely social processes – involved in the dictator's allocation decision that

make the dictator act in a manner that does not follow typical economic rationality (Guala & Mittone, 2010).

Typically, the dictator games that are used to study fairness and giving behavior are non-interaction games, meaning that the participants do not engage in some interaction related to the allocation of the money (e.g., a negotiation). Though newer experiments do allow participants to meet and learn information about each other, the participants in typical games still do not interact in the economic situation. For the purposes of the current work, the most relevant kinds of games are those in which the subject can learn information about their counterpart, as these situations are most similar to basic real-world interactions.

A meta-analysis of over 100 dictator game studies found that dictators give less the closer they are to the recipient (Engel, 2011), which seemingly contradicts social psychology work indicating that people are generally more prosocial with people to whom they are closer (e.g., Tajfel et al., 1971). Upon closer examination, though, the meta-analysis found that, when the dictators and recipients were any closer than being members of same subject pool (i.e., any closer than some base and relatively arbitrary level of similarity), generosity was practically stable (Engel, 2011). However, Engel's (2011) meta-analysis was not conducted exclusively with studies that manipulated social distance, so further conclusions can be generated from describing the results of studies that isolated the relationship between social distance and dictator game outcomes.

Hoffman et al. (1996) were among the first to explore social distance in dictator games. They placed subjects in dictator games with varying degrees of social isolation, which served as a proxy for social distance. Social isolation (and therefore social distance) was manipulated through the methods by which the dictator made the allocation. One such method was through an

anonymous envelope that was to be left for the recipient of the money. Anonymity was maintained; recipients were not identified to the dictators before the dictators made their allocations. Results supported the hypothesis that as social isolation (and thus social distance) increased, there was a shift toward lower offers (Hoffman et al., 1996).

Whereas Hoffman et al. (1996) explained their results by inferring that reducing anonymity evokes a strategic reciprocity that is common in everyday interactions and worked its way into their lab, Bohnet and Frey (1999) determined in a replication of the Hoffman et al. (1996) work that generosity in dictator games is not determined by reciprocity but by the ability to identify the recipients of money. This identification can be done through seeing the recipient or knowing something about them. The authors came to this conclusion by varying social distance through the allowance of different degrees of identification between dictators and recipients, which allowed them to find separate reciprocity and fairness reference points. When visual information about the recipient was present, behavior toward the recipient (i.e., the money allocations) was more pronounced if dictators were presented with some information about the recipient. This supported the belief that increased generosity is caused by reduced social distance, as caused by identifying information (Bohnet & Frey, 1999).

Charness and Gneezy (2008) took issue with the anonymity employed in the study designs of Hoffman et al. (1996) and other previous game theory work, arguing that anonymity was unrealistic to real-world economic interactions. Charness and Gneezy (2008) therefore introduced participant last names to dictator and ultimatum games and found that this information that reduced social distance resulted in higher allocations in the dictator game. Thus, Charness and Gneezy's (2008) conclusion supported Hoffman et al.'s (1996) conclusions from

the dictator games and added greater relevance to real-world situations through the use of more realistic social information.

Other work has since gone further in removing anonymity in dictator games and found the same effects. Research has also been conducted on altruism and giving within friendship networks, where social distance is assumed to be automatically very low, as the members of the networks are already quite close before the experiment. Leider et al. (2007) examined dictator games within college friendship networks and determined that dictators gave more the closer the friendship they had with the recipient was. In other words, when social distance was extremely low (i.e., the participants were close), participants gave greater amounts (Leider et al., 2007).

Therefore, it can be seen from a variety of different experiments in different contexts that, as social distance decreases, the level of giving in dictator games increases. So, social distance plays a crucial role in determining giving behavior, and some experiments have set up constructs that allow for better extrapolation to real-world contexts (e.g., Charness & Gneezy, 2008). However, no work other than the ongoing work of Hagenbach et al. (2022) has explored the effect of the economic situation on social distance, and this is a crucial area to understand. Though it is understood that reduced distance increases giving behavior, it is still necessary to understand how choices to give affect perceptions of social distance with others.

C. This Work Relative to the Literature

a. *General Aims*

The aim of the current work was to identify a baseline effect of the economic situations on the social distance between two individuals and build on the aforementioned understandings of what motivates donation behavior, especially closeness as a factor in predicting donations. As donations are predicted by closeness (Tajfel et al., 1971; Small & Simonsohn, 2008), the current

work examines the opposite effect: the effect of prosocial behavior on social distance. Whereas many existing studies have explored donation frameworks on their own, the current work also compares how economic situations of taxation and donation affect the social distance between two individuals. By employing a comparison of the effects of taxation and donation situations on social distance, this work expands upon understandings of how various situations affect social distance and has great relevance to the real world, where taxation and donation are extremely common methods of transferring money to others.

Several elements of the understanding of social behavior, such as the discussion of individual differences, were included primarily as context. Although important, the current study did not aim to determine how individual differences were related to social distance in the economic situations. This is because the current study is one of the first of its kind; therefore, it is necessary to identify baseline effects of the economic situations on social distance. It may, however, be possible to explain the results of this work using a theory of individual differences, which will be addressed in the Conclusion section.

b. ***Presentation of Social Information in the Dictator Game***

Though the dictator game is often used to test donation situations, it is important to note that the dictator game is a *tool* used to simulate donation frameworks. Accordingly, the current work used the dictator game to simulate real-world donation situations but did not seek to directly contribute to the literature on dictator games. This work's goal was to contribute to the literature on prosocial economic behaviors, and this goal was accomplished by using the dictator game as a *tool* to establish donation frameworks.

There are some notable changes to the dictator game used in this work, relative to that used in many previous economics studies. Notably, because this work aimed to isolate the effect

of the economic situations on social distance, information about other participants in the game was not provided to subjects before the economic framework was established. The decision to maintain anonymity between participants during the economic situation was also made with acknowledgement of all the previous work that demonstrates that identifying information affects social distance before the game is completed and therefore affects the outcome of the game. Because the current work's goal was to identify the effects of taxation and donation on social distance, an area which was previously unexplored, it was necessary to first establish base-level effects in such a framework. This is similar to the way in which classic research on the dictator game maintained anonymity, and newer research has adapted the framework for more realistic settings. Because the current work's primary aim was to establish the baseline effect in a previously unexplored area of investigation, it was necessary to present participant information after the economic interaction between the two participants. Though presenting participant information before the economic situation might differently affect social distance (as seen in much of the dictator game literature; as cited previously), doing so would also interfere with the identification of the effect of the economic framework on social distance, as social distance would be affected by the presentation of participant information. Thus, participant information was provided after the economic framework. Ideally, future studies will expand on this work and explore different ways to manipulate social distance within the contexts presented here.

c. ***Earning Money***

Another difference between the economic game framework used in the current work and that used in early research employing the dictator game is that the current work required subjects to earn the money they transferred to another participant. In general, it is believed that there is a difference between earning money and being given money, especially when one is asked to give

their money to another person. This concept is easy to test using the dictator game framework, and, if there is a significant effect of the way in which an individual receives their money, the effect of earned money must be considered in any study design that involves giving participants money.

Typically, research with the dictator game has used money that is freely given to the dictator (an endowment), and it is found that dictators typically give away at least 20% of their money, even in the anonymous dictator game (Camerer, 2003, as cited in Oxoby & Spraggon, 2008). However, because people are rarely given money for free in the real world, it is more relevant to understand how people behave when they are made to earn their money.

An early study by Cherry et al. (2002) made participants earn their money by answering a series of quiz questions. Then, participants were put through a standard dictator game framework. In the baseline treatment, where participants were endowed with money, the game theoretically predicted *zero offer* occurred less than 20% of the time (there were two conditions: low-stakes bargaining, where the *zero offer* occurred 19% of the time, and high-stakes bargaining, where the *zero offer* occurred 15% of the time). When participants were made to earn their money, they were more conservative with their gifts, and the *zero offer* occurred more than 70% of the time (79% in the low-stakes bargaining; 70% in the high-stakes bargaining). Thus, when assets are legitimized (i.e., participants are made to work for their money), people are significantly less likely to part ways with their money (Cherry et al., 2002).

The literature provides some possible explanations for this result. Korenok et al. (2017) proposed that feelings of ownership are affected by the attributes of the game, so a dictator who earned their money may have strong feelings of ownership over that money. Korenok et al. (2017) administered a questionnaire designed to measure feelings about earned money in the

dictator game and found that feelings of ownership mediated the effect of changes in the dictator's generosity. In other words, when the dictator earned money, their feelings of ownership were increased, which served to decrease their giving (Korenok et al., 2017).

Based on these findings involving participants earning the money they used in economic games, the current work also chose to require participants to earn their money. Endowing participants with money is not only unrealistic, but it is also clear from the literature that earning money in an economic game framework has a distinct effect on behavior. Therefore, this work adopted an innovation upon early work involving dictator games and chose to have participants earn money using real-effort tasks before participating in the economic situations.

III. Theoretical Framework

In economics and psychology, three general components make up the broad theory of prosocial behavior: social distance, benefits from donation, and individual differences. There are no existing theories that explain the relationships predicted in the current work, since this work examines a previously unexplored effect. Theories can provide a deeper understanding of the background of the area, but no theories presented here directly inform this work's hypotheses.

A. Social Distance

The relevant theory of social distance and prosocial behavior is less of a theoretical construct and more a series of results from social psychology and, more recently, economics. In the absence of a formal theory, it suffices to say that results from both disciplines have demonstrated that people act more prosocially toward those with whom they are close. Many of these results have already been provided in the Literature Review portion of this paper, but it is worth expanding upon these previous works and examining a few new ones here.

Tajfel et al.'s (1971) classic study began the discussion of social distance within the context of prosocial behavior. As already mentioned, their result was one of the first to indicate that people act more prosocially with people in their ingroup, implying that people give more money when they are closer to recipients. In the time since, countless studies have confirmed this effect (e.g., Charness & Gneezy, 2008; Leider et al., 2007; Small & Simonsohn, 2008). The key understanding from this body of work is that the effect of social distance on donation behavior has now become an accepted effect in the economics and psychology literature.

Chen and Li (2009) proposed a complex model of utility in charitable situations that explains a Person B's utility as a function of the individual's own monetary payoff and the monetary payoff of the charity recipient (Person A):

$$u_B(\pi_A, \pi_B) = w_A^1 \pi_A + (1 - w_A^1)\pi_B,$$

where π_A and π_B are the monetary payoffs of Person A and Person B, respectively, and w_A^1 is the weight that Person B puts on Person A's monetary payoff. w_A^1 is defined by:

$$w_A^1 = \rho(1 + Ia)r + \sigma(1 + Ib)s,$$

where $I = 1$ if the two individuals are in the same social ingroup, and otherwise $I = 0$. The parameters a and b account for the ingroup effects of charity and envy, respectively.[2] The utility function therefore explains Person B's utility as a function of their own payoff and the payoff of the charity recipient (Person A), weighted by a function that accounts for whether the individuals are in the same ingroup (therefore accounting for the social distance between the individuals) and effects caused by one person receiving more or less money than the other. In this model, there is a relationship between the utility of the giver and the amount of money received by the recipient,

[2] For a complete explanation of the complex utility function and its weights, see Chen and Li (2009).

which may be different depending on the amount of money received by each and the social distance between the two individuals (Chen & Li, 2009).

Though the theoretical utility function proposed by Chen and Li (2009) is not the primary focus of and was not tested in the current work, it is useful in framing how individuals interact in situations involving charitable giving. According to the utility model, people's behavior in charitable situations is affected by the amount of money they give, the amount of money they receive, and their social distance with others (Chen & Li, 2009). However, it must be noted that the current work tested a reverse effect of what has been studied previously, so models predicting how individuals' behavior may be affected by social distance are useful in guiding the focus of the current work but cannot inform this work's predictions on their own. Broadly, theoretical models of behavior in charitable situations provide useful ways to contextualize thinking about economic situations and social distance.

B. Benefits from Donation

The most important component of the theory of benefits from donation behavior is the theory of *warm glow giving*, developed by Andreoni (1989). This theory describes multiple reasons why individuals donate to public goods. First, people donate because they derive inherent utility from the public good. Second, they donate for their personal benefit, or the *warm glow* they receive from donating. Preferences for donation thus consist of a combination of these elements, where people contribute to the public good because they demand the good and because they receive some benefit from the act of donating. In this way, altruism is proposed to be impure because it also consists of the personal benefit. Preferences under this model are represented by:

$$U_i = U_i(x_i, Y, g_i), i = 1, \ldots, \mathrm{n},$$

where Y = total supply of the public good and g_i = the individual's contributions to the public good (Andreoni, 1989).

Andreoni's (1989) work specifically concerns the implication that "impure altruism makes private gifts *imperfect* substitutes for gifts from other sources" (p. 1457).[3] However, construction of preferences in the model reveals crucial flaws in the prior economic understanding of giving behavior. *Warm glow* proposes that individuals derive benefit from the act of donating (Andreoni, 1989). In understanding individuals' donation behavior, it is crucial to understand that individuals may donate because of the *warm glow* they may receive from the act.

Andreoni's (1989) model of *warm glow giving* has since been empirically supported by several works. Crumpler and Grossman (2008) conducted an experimental test of the *warm glow* hypothesis, in which participants were able to donate to a charity of their choice, using a design in which there was no altruistic incentive for giving because individuals did not receive any benefit from the charity of choice. The results showed that the *warm glow* hypothesis was supported; individuals gave 20% of their endowments to charity (Crumpler & Grossman, 2008). Bischoff and Krauskopf (2015) found a similar result in their experimental study of *warm glow giving*, where they found that, when individuals chose to donate of their own volition, a feeling of *warm glow* resulted. Therefore, Andreoni's (1989) model of *warm glow giving* has generally become accepted by the field, and it is now understood that individual donation decisions are affected by the *warm glow* an individual receives from their choice to donate.

Though the theory of *warm glow giving* is also not a focus of the current work, it can be useful in providing a thought framework for this work. The current work can be thought of as evaluating the potential that these effects *extend to others*, or, in other words, the effect that

[3] For a complete mathematical analysis and description of the theory of *warm glow*, see Andreoni (1989).

givers receive a *warm glow* about themselves and the recipient that causes both greater utility and better social perceptions of the recipient. Therefore, the current study could be thought of as testing whether prosocial giving does cause the *warm glow* to *extend* to the recipient, though this testing is not done formally in this study and is merely a thought experiment.

C. Individual Differences

Individual differences are also known to be important in understanding people's donation behavior. Theories of individual differences are distinct because they each deal with different classes of differences. The most relevant areas of consideration are presented here.

a. *Theory of Individual Values*

The most prevalent theory of human values is that of Schwartz (1992, as cited in Sneddon et al., 2020), which proposed 10 basic values that were later divided into 20 more specific values. Various studies have found that specific values tend to predict certain donation behaviors. For example, values of universalism and benevolence have been found to predict prosocial behaviors (Sagiv et al., 2011). Schwartz (2010, as cited in Sneddon et al., 2020), elaborated on the relationship between universalism and benevolence and prosocial behavior by presenting that, for people who prioritize these values, prosocial behaviors should, in his theory, affirm a moral self-identity, thus encouraging prosocial behavior. By contrast, people who prioritize values of power and achievement are less likely to accept the costs associated with prosocial behavior, which discourages such people from acting prosocially (Schwartz, 2010, as cited in Sneddon et al., 2020). This theory of personal values, which differ across individuals, thus may also help to explain individual differences in giving.

b. *Social Orientations*

In psychology, there are three proposed social orientations: individualistic, competitive, and prosocial. Individualists seek to maximize their own benefit, whereas competitors want to minimize another person's outcomes to gain a relative advantage. By contrast, prosocial people want to maximize outcomes for themselves and others (Knight & Dubro, 1984, as cited in Van Lange et al., 2010; Van Lange, 1999, as cited in Van Lange et al., 2010).

Work examining the association between individuals' social orientations (as measured by a self-report questionnaire) and their donation behavior has found that individuals with prosocial orientations tend to engage in a greater number of donation behaviors, as compared to individualists and competitors. Additionally, these individual differences in social orientations were especially predictive of donation behavior to organizations that were aimed at helping those who are reliant on such help, with prosocial individuals again being most likely to donate to these groups (Van Lange et al., 2010). Social orientations may thus help to explain individual differences in donation behavior and are an important consideration in a discussion of individual differences in donation, as people with prosocial orientations would most want to give to others in order to maximize others' benefit.

c. *The Importance of Individual Differences*

Both the theoretical models proposed by Chen and Li (2009) and Andreoni (1989) can be thought of in terms of individual differences. Given that social orientations are well-known potential individual differences (Van Lange et al., 2010), it is therefore logical that the weights that people place on recipients' monetary payoffs (Chen & Li, 2009) and the degree to which a *warm glow* exists after giving (Andreoni, 1989) may vary individually. Therefore, people with prosocial orientations may place higher weights on recipients' payoffs or have a larger *warm glow*, leading these people to potentially perceive the recipients of their money more positively

than people with other orientations. Taken together, individual differences can help to explain the results in both Chen and Li (2009) and Andreoni's (1989) theoretical models involving giving and might similarly be used to theoretically explain the results of the current work.

IV. Data and Methodology

A. Experimental Design

The experimental variation in the current study (donation versus taxation) resulted in a 2 × 1 *between-subject design*. The experimental variation determined whether subjects were taxed for some percentage of their money (with that money being transferred to a recipient) or were given the option to donate a percentage of their money to the recipient. To allow for the comparison of the donation and taxation conditions, the experiment was constructed to allow for the near matching of donation and taxation amounts. Taxation rates were predetermined using the donation distribution from a 50-participant pilot study, which became the exact distribution of taxation amounts used in the experimental study. Donation amounts were chosen by subjects and were presented in increments of 10%, which resulted in larger frequencies of each possible amount occurring and made comparing across conditions feasible.

In this cross-subject study, subjects were asked their social perceptions of others in different exogenously varied economic settings in order to evaluate subjects' social distance with others. In Part One of the experiment, subjects were asked to complete a four-item Study Questionnaire on their own attributes and preferences. In order to eliminate any potential order effects of the order in which the Study Questionnaire items were displayed, 10 orders of questions were created and were randomly assigned to subjects. In Part Two, subjects completed simple sentence and pattern completion real-effort tasks and earned bonus money.

In Part Three, subjects' money was transferred to a randomly selected passive participant (henceforth called Person A). In the taxation treatment, participants were forced to transfer a predetermined portion of their money to Person A. In the donation treatment, participants were given the option to donate some of their money to Person A. Person A was randomly selected from a previously recruited pool and had completed the same Study Questionnaire.

In Part Four, the experimental outcome was measured, and subjects were asked their social perceptions of Person A. Subjects viewed Person A's answers to the Study Questionnaire and were asked on a scale how similar they were to Person A (similarity), and to guess how many profile items in the Study Questionnaire they had in common (commonality). Similarity and commonality were two different measures of social distance; similarity was a more general concept, and commonality was a specific, numerical measure. Similarity and commonality are measures of social distance that are thought to encapsulate the concept of social distance, in the absence of an agreed upon method of evaluating social distance in either psychology or economics. The design thus allowed for measuring whether similarity and commonality were affected by the treatments and for a control for how objectively similar subjects were, according to answers on the Study Questionnaire.

B. Participants

Participants were identifiable only by identification numbers provided by Qualtrics, the platform which hosted the survey, and by Prolific, the platform on which the study was listed and participants were paid. Participants were randomly sampled from Prolific's user population and included only English speaking and reading individuals who were based in the United States. A total of 1022 participants completed the survey, and 65 participants were removed from the

sample for several reasons (the data management process is described in the Data Management section), leaving 957 subjects in the final sample.

Participants were paid $1.00 for participating and were paid an additional bonus of $0.15 per correctly completed real-effort task (all but two participants completed the required 10 tasks and earned $1.50 in bonus money). Subjects were also paid up to $0.10 for correctly guessing the number of answers in common with Person A. Participants received the remaining bonus money after they transferred a portion to Person A; Person A was a real person from a previous study who received the money transferred to them. In total, $2.60 was available in compensation to participants, though most did not receive the full amount because they either did not correctly guess the number of common answers or transferred a non-zero amount of money to Person A.

C. Procedure

The study design was approved by the Duke University IRB and was pre-registered on AsPredicted.org. All data were collected on Qualtrics. Prolific, an online research platform, was used for the distribution of the survey and to pay participants. The only noteworthy selection criteria were that only English speaking and reading subjects were included, and subjects who participated in the other studies conducted by Hagenbach et al. (2022), were excluded.

Data were collected on December 8, 2021, between 10:00am ET and 1:37pm ET. The average time to complete the survey was roughly eight minutes. To collect equal numbers of male and female subjects, data collection was split into two 500-subject groups, such that one group primarily collected male subjects, and the other group primarily collected female subjects. Non-binary or other gender identity groups were split between the two collection groups. Individuals identifying as “Trans Male/Trans Man” or “Different Identity” were collected in the primarily male group, and individuals identifying as “Trans Female/Trans Woman,”

"Genderqueer/Gender Non-Conforming," or "Rather Not Say" were collected in the primarily female collection group. Both groups were collected at the same time, and there was no observable difference between the two collection groups.

a. *Hypotheses*

The primary aim of this work was to determine how donation, a *strong* prosocial behavior in which individuals *choose* to give money to others, affects perceived social distance, as compared to taxation, a comparatively *weak* prosocial behavior in which people are forced to give money to others. The different economic settings were expected to significantly affect subjects' subjective assessments of being similar and having answers in common with Person A. The hypothesized effects were as follows:

On average, the subject's potential similarity to and commonality with Person A would be larger when the subject was placed in the donation condition than in the taxation condition[4]:

$$\text{Hypothesis 1: } Average(OV[\text{taxation}]) < Average(OV[\text{donation}])$$

On average, the subject's potential similarity to and commonality with Person A would be higher for higher *donation amounts*. Conversely, the subject's potential similarity to and commonality with Person A would be lower for higher *taxation amounts*:

$$\text{Hypothesis } 2a\text{: } OV \text{ increases with donation amount}$$

$$\text{Hypothesis } 2b\text{: } OV \text{ decreases with taxation amount}$$

D. Dataset and Measures

a. *Data Management*

The two data collection groups were combined in Excel so that the complete raw data consisted of 1022 participants (511 from each collection group). The raw dataset was too large to

[4] Hypotheses were the same for both similarity and commonality, so the hypotheses are presented here for the dependent variable Outcome Variable, denoted *OV*, which can represent either similarity or commonality.

be correctly imported into STATA for management and analysis, so most timing variables, which recorded the time subjects spent on a question, were removed in Excel. Once the data were imported into STATA, two main manipulations were performed. The first was to remove 65 subjects from the dataset for the following reasons: 22 subjects did not complete the survey, two did not earn the full $1.50 in bonus money, and 41 completed the survey abnormally slowly (more than two standard deviations greater than the mean time taken to complete). Subjects who did not earn the full $1.50 in bonus money were removed because there were 20 opportunities to complete 10 correct tasks, so completion of fewer than 10 tasks was below a 50% rate of correct answers. Additionally, to accurately compare subjects, all subjects must have earned equal amounts of bonus money. A total of 957 subjects remained in the final sample.

The second main manipulation was to correct an error with the automatic data entry process for subjects who received Questionnaire Order Two (of the 10 randomly assigned orders). Participants in this order did not have categorical responses for the Marriage and Political Party questions, but the dataset contained numerical raw data for these questions. Thus, raw data were used to replace the gaps in the categorical data, resulting in a complete dataset for all participants. This process had no real effect on the data, as the data that were used to replace missing entries were contained within the dataset, meaning that the changes only served to recode numerical responses as categorical ones. The final step was to use the correct categorical responses to questionnaire items to recalculate correct bonus amounts and the actual number of common answers between subjects and Person A, which were originally automatically calculated using the incorrect categorical responses to the questionnaire items. After this was completed, the dataset consisted of complete responses for all items.

Beyond these two main manipulations, certain variables were re-coded for the purposes of analyses or clarity. These included the age variable (originally encoded as birth year), which was calculated using the birth year subtracted from the year in which the data were collected (2021). The education variable and the four questionnaire items were duplicated so that each variable existed in both numerical and categorical format, so these variables could be used in analyses. An indicator variable for the donation condition was also created. Several variables were converted from categorical to numerical format for the purposes of analyses. Numerous variables were renamed to make their identification easier. Finally, a mean centered version of the transfer amount variable was created for the purposes of analyses involving interaction terms.

b. *Measures*

The dataset consisted of the following main variables for each subject: the experimental treatment (taxation or donation), subjects and Person A's answers to the Study Questionnaire (Part One), task performance (Part Two), the amount of money transferred by subjects (Part Three, donation and taxation conditions), and subjects' answers to the questions about Person A (Part Four). Using subjects and Person A's responses to the Study Questionnaire, a measure of objective commonality to Person A was constructed. This measure is denoted *common_answers* and is equal to the number of common answers on the Study Questionnaire between subjects and Person A, taking values from zero to four. To maintain consistency with the other components of Hagenbach et al.'s (2022) work, responses were coded using the same method used in previous studies conducted by Hagenbach et al. (2022).

There were two primary dependent variables in the dataset: *similarity* and *commonality*. *Similarity* came from the subjects' responses to the question: "How similar are you to Person A?" *Commonality* was the result of the question: "You answered the 4-item Study Questionnaire

at the beginning of the survey. How many answers do you have in common with Person A? You will earn a bonus of $0.10 if you are exactly correct, $0.05 if you are within 1 of the correct number, $0 if you are 2 or more outside the correct number." There were several other useful variables, such as the Study Questionnaire items. Variable descriptions for relevant variables are contained in Table 1 (see Appendix).

c. *Descriptive Statistics*

The frequencies and distributions of the taxation and donation conditions are shown in Table 2. The transfer method was randomly assigned and thus was intended to be split roughly equally between donation and taxation. The transfer method frequencies reveal that the roughly equal split between the two groups was successfully achieved.

Table 2

Taxation and Donation Condition Frequencies

Transfer	*n*	%
Donation	476	49.740
Taxation	481	50.260
Total	957	100.000

Note. The distribution of the transfer method comes from the variable *transfer*. The distribution of *donate_dummy* is the same as the distribution of *transfer* because *donate_dummy* represents the same information as *transfer* in numerical format.

The mean age in the sample was 35 years, and the distribution of ages ranged from 18 to 84 years. The most common age was 22 years, with 44 subjects responding that they were this age. The mean time to submit the similarity question was 7.724 seconds, and the distribution ranged from 2.049 seconds to 124.509 seconds. The mean time to submit the commonality question was 19.955 seconds, and the distribution ranged from 3.776 seconds to 274.823 seconds. Table 3 (see Appendix) describes the descriptive variable education level (*education),* the questionnaire items gender (*g_1_female),* marital status (*g_4_marriage)*, party leaning

(*g_5_polpartydem)*, and season preference (*g_8_seasonfall*), the dependent variables *similarity* and *commonality*, and the independent variable actual common answers (*common_answers)*.

Table 4 contains the distribution of taxation and donation amounts. Donation amounts were chosen by subjects in the study, and taxation amounts were predetermined using the donation distribution from the pilot study. The most common donation amount was zero percent, indicating that people may not like to give money away, even when given the option to do so.

Table 4

Taxation and Donation Amount Distributions

Transfer Amount (%)	Taxation		Donation	
	n	%	*n*	%
0	212	44.070	227	47.690
10	45	9.360	70	14.710
20	58	12.060	45	9.450
30	34	7.070	22	4.620
40	16	3.330	13	2.730
50	99	20.580	75	15.760
60	0	0.000	0	0.000
70	0	0.000	1	0.210
80	0	0.000	5	1.050
90	0	0.000	2	0.420
100	17	3.530	16	3.360
Total	481	100.000	476	100.000

Note. Distributions of donation and taxation amounts were obtained from the variable *transfer_amount*.

The distribution of the gap between the actual number of common answers and the commonality rating (guess of common answers) is displayed in Table 5 (see below). A large portion of subjects were accurate in their guesses of commonality. Approximately 58% of subjects were completely accurate in their guesses of common answers. Roughly 88% of subjects

were within one of the correct number of common answers (an absolute value gap of zero or one).

Table 5

Distribution of Differences Between Commonality Guesses and Actual Common Answers

Guess Gap (Absolute Value)	*n*	%
0	553	57.780
1	292	30.510
2	90	9.400
3	19	1.990
4	3	0.310
Total	957	100.000

d. *Correlation Analyses*

Pearson correlation analyses were used to visualize relationships between variables. The four questionnaire items were not strongly correlated, a relationship that was by design, since the four questionnaire items were selected because they were not strongly correlated in a previous pilot study. *Similarity* and *commonality* were strongly correlated, $r = .682$, a relationship that was expected because *similarity* and *commonality* were predicted to be similarly affected by whether subjects transferred their money by donation and by the transfer amounts. Political party leaning was moderately correlated with both *similarity*, $r = .279$, and *commonality*, $r = .259$. See Table 6 (see Appendix) for the complete correlation matrix. The relationships between political party leaning and *similarity* and *commonality* were explored as exploratory analyses, and the results are discussed in the Exploratory Analyses section of Univariate Results.

E. Empirical Procedure

Because this work is an extension of the work of Hagenbach et al. (2022), the empirical methodology of this work was like that used in their previous work. Statistical analyses were

performed in STATA. After performing primary analyses, exploratory analyses were conducted in areas of interest. Results for all analyses are presented in the Results and Discussion section.

The first set of statistical tests used were simple two tailed *t*-tests comparing the differences in means indicated in Hypothesis One. Because Hypothesis Two specifies an interaction effect and trend relationships, it was not feasible to perform *t*-tests to evaluate this hypothesis.

The second set of statistical tests considered treatment effects on the outcome variables. To determine robust effects of potential differences in means found using *t*-tests and to evaluate Hypothesis 2, the following ordinary least squares linear regression models were used to determine treatment effects on each social perception, controlling for the amount transferred to Person A and the objective commonality between subjects and Person A:

The difference in the effect on similarity and commonality with Person A when subjects were taxed or given the option to donate their money was determined, controlling for the amount of money given to Person A and the objective commonality between the subject and Person A:

$$OV = \alpha + \beta_1 \text{transfer\_amt} + \beta_2 \text{common\_answers} + \gamma_1 \text{donate\_dummy} \quad (1)$$

The effect of the amount transferred in the taxation and donation conditions was examined using the same previously specified model with an added interaction term[5]:

$$OV = \alpha + \beta_1 \text{transfer\_amt} + \beta_2 \text{common\_answers} + \gamma_1 \text{donate\_dummy} + \gamma_2 \text{transfer\_centered} \times \text{donate\_dummy} \quad (2)$$

To understand the directionality of the interaction effect in Equation Two, the effect on *similarity* and *commonality* of the amount of money transferred from the subject to Person A,

[5] A mediation analysis was not used to evaluate the effect of the amount of money transferred because it was not believed that the economic situation affected social distance *through* the amount, as in mediation. Because it was predicted that the amount affected social distance on its own, an interaction was used to explore this effect.

within the taxation and donation conditions, independently, was examined, controlling for the actual number of common answers between the subject and Person A:

$$OV = \alpha + \beta_1 \text{common\_answers} + \gamma_1 \text{donation amount} \quad (3)$$

$$OV = \alpha + \beta_1 \text{common\_answers} + \gamma_1 \text{taxation amount} \quad (4)$$

V. Results and Discussion

A. Univariate Results

a. *Variable Distributions*

i. Taxation and Donation Amounts. A two-sample Kolmogorov-Smirnov (K-S) test for the equality of the taxation and donation distributions revealed that the two distributions were not equal (Table 7). In order to account for the statistical non-equivalence between the taxation and donation amounts, multivariate analyses included controls for the transfer amount.

Table 7

K-S Test for Equality of Amount Distributions

Smaller Group	D	*p*-value
Donation Condition	0.0896	.021*
Taxation Condition	-0.0151	.897
Combined K-S	0.0896	.043*

Note. The taxation and donation amount distributions were obtained from the variable *transfer_amount*.

* $p < 0.05$

ii. Questionnaire Items. Two sample K-S tests were used to determine whether the four Study Questionnaire items were distributed evenly across the taxation and donation conditions. Table 8 (see below) contains the results of the K-S test for the distribution of the genders across the donation and taxation conditions. Table 9 (see below) contains the results of the K-S test for the equality of the distribution of marital status across the donation and taxation conditions. Table 10 (see below) contains the results of the K-S test for the equality of the distribution of political party leanings across the donation and taxation conditions. Table 11 (see

below) contains the K-S test for the equality of the distribution of season preferences across the donation and taxation conditions.

Table 8

K-S Test for Equality of Gender Distribution

Smaller Group	D	*p*-value
Donation Condition	0.000	1.000
Taxation Condition	-0.011	.946
Combined K-S	0.011	1.000

Note. The gender distribution was obtained from the *Study Questionnaire* item *g_2_female*.

Table 9

K-S Test for Equality of Marital Status Distribution

Smaller Group	D	*p*-value
Donation Condition	0.014	.915
Taxation Condition	0.000	1.000
Combined K-S	0.014	1.000

Note. The marital status distribution was obtained from the *Study Questionnaire* item *g_4_marriage*.

Table 10

K-S Test for Equality of Political Party Leaning Distribution

Smaller Group	D	*p*-value
Donation Condition	0.000	1.000
Taxation Condition	-0.039	.484
Combined K-S	0.039	.861

Note. The political party leaning distribution was obtained from the *Study Questionnaire* item *g_5_polpartydem*.

Table 11

K-S Test for Equality of Season Preference Distribution

Smaller Group	D	*p*-value
Donation Condition	0.019	.848
Taxation Condition	0.000	1.000
Combined K-S	0.019	1.000

Note. The season preference distribution was obtained from the *Study Questionnaire* item *g_8_seasonfall*.

The K-S tests revealed that there were no statistically significant differences in the distributions of the responses to the Study Questionnaire items across the donation and taxation conditions, as expected.

iii. Common Answers. Table 12 contains the results of the K-S test to determine whether the distribution of the actual number of common answers between the subject and Person A was equivalent across the donation and taxation conditions. The K-S test revealed that there was no difference in the distribution of the actual common answers across the donation and taxation conditions, as expected because the conditions were randomly assigned.

Table 12

K-S Test for Equality of Common Answers Distribution

Smaller Group	D	*p*-value
Donation Condition	0.024	.758
Taxation Condition	-0.024	.752
Combined K-S	0.024	.999

Note. The common answers distribution was obtained from the Study Questionnaire item *g_8_seasonfall*.

b. *Hypothesis One*

The first main statistical tests involving the dependent variables were two-tailed *t*-tests to determine the differences in *similarity* and *commonality* between the taxation group and donation group. No significant difference in *similarity*, $t(955) = -0.911$, $p = .362$, was found between the 476 subjects in the donation group ($M = 3.271$, $SD = 1.150$) and the 481 subjects in the taxation group ($M = 3.341$, $SD = 1.223$). There was also no significant difference in *commonality*, $t(955) = 0.477$, $p = .634$, between the 476 subjects in the donation group ($M = 2.067$, $SD = 1.402$) and the 481 subjects in the taxation group ($M = 2.023$, $SD = 1.477$).

c. *Exploratory Analyses*

Multiple *t*-tests were performed to evaluate whether there was a difference in *similarity* and *commonality* across each questionnaire item. Gender, marital status, political party preference, and season preference did not have an effect on *similarity* or *commonality*.

Two tailed *t*-tests were performed to evaluate whether there was a difference in the time taken to complete the similarity and commonality questions by the transfer method. Using $\alpha = .05$, there was not a significant difference in the time taken to complete the similarity question, $t(955) = 1.938$, $p = .053$, between the 476 subjects in the donation group ($M = 8.276$, $SE = 0.499$) and the 481 subjects in the taxation group ($M = 7.178$, $SE = 0.272$). There was also not a significant difference in the time taken to complete the commonality question, $t(955) = 1.771$, $p = .077$, between the 476 subjects in the donation group ($M = 20.884$, $SE = 0.877$) and the 479 subjects in the taxation group ($M = 10.033$, $SE = 0.571$). Though these differences were not significant at a 95% confidence level, they were significant at a 90% confidence level. Therefore, the difference in time to submit the similarity and commonality questions between the donation and taxation groups may be *nearly* significant.[6] In both the similarity and commonality questions, subjects in the donation group took longer to submit their responses than subjects in the taxation group, suggesting that being in the donation group *may* have caused additional thinking time to be necessary.

B. Multivariate Results

a. *Hypothesis One*

Results of the multiple regression analysis for the effect of the donation condition on *similarity*, controlling for the transfer amount and actual common answers, indicated that only

[6] These results were also evaluated at the 90% confidence level because the timing measures were not necessarily fully rigorous methods of measuring the time taken to complete the social distance questions. For example, people may have been distracted while answering the questions. Given the *near* significance of the *t*-tests, it is possible that the differences in time to submit would be significant with more rigorous methods of measurement.

actual common answers, $\beta = -0.786$, $p < .001$, significantly predicted *similarity*. The transfer amount and the effect of the donation condition were not significant predictors of *similarity*. The final model accounting for the effect of all three predictors was significant, $F(3, 953) = 274.490$, $p < .001$, and accounted for 46.2% of the variance, *Adj*. $R^2 = .462$ (Appendix, Table 13).

Results of the multiple regression analyses for the effect of the donation condition on *commonality*, controlling for the transfer amount and actual common answers revealed that actual common answers, $\beta = 1.054$, $p < .001$, was again the only significant predictor of *commonality*. The transfer amount and the effect of the donation condition were not significant predictors of *commonality*. The final model accounting for the effect of all three predictors was significant, $F(3, 953) = 415.480$, $p < .001$, and accounted for 56.5% of the variance, *Adj*. $R^2 = .565$ (Appendix, Table 14).

b. *Hypothesis Two*

The second regression model examined the effect of the donation condition and the interaction between the donation condition and the transfer amount (using the mean centered transfer amount), again controlling for the transfer amount and the actual number of common answers. The interaction model revealed that the interaction significantly predicted *similarity*, $\beta = -0.497$, $p = .027$. The final model accounting for the effect of the interaction was significant, $F(3, 953) = 207.940$, $p < .001$, and accounted for 46.4% of the variance, *Adj*. $R^2 = .464$ (Appendix, Table 15). The third regression model provided greater insight into the interaction effect by examining the separate effects of the taxation and donation amounts on *similarity*, while controlling for actual common answers. The regression model that examined that the taxation amount's effect on *similarity* revealed that the taxation amount, $\beta = -0.343$, $p = .037$, and common answers, $\beta = -0.794$, $p < .001$, significantly predicted *similarity*. The final model

accounting for the effect of the taxation amount was significant, $F(2, 478) = 208.960$, $p < .001$, and accounted for 46.4% of the variance, *Adj*. $R^2 = .464$ (Appendix, Table 16). The regression model that examined the effect of the donation amount on *similarity* revealed that only common answers, $\beta = 0.780$, $p < .001$, significantly predicted *similarity*. The donation amount was not a significant predictor of *similarity* in this model. The final model accounting for the effect of the donation amount was significant, $F(2, 473) = 205.700$, $p < .001$, and accounted for 46.3% of the variance, *Adj*. $R^2 = .463$ (Appendix, Table 17).

Finally, the regression analysis for the effect of the donation condition and the interaction of the donation condition and the transfer amount (using the mean centered transfer amount) on *commonality* revealed a non-significant effect of the interaction, $\beta = 0.253$, $p = .302$, on *commonality*. The final model accounting for the effect of the interaction was significant, $F(4, 952) = 311.900$, $p < .001$, and accounted for 56.5% of the variance, *Adj*. $R^2 = .565$ (Appendix, Table 18). Accordingly, the regression model that examined the effect of the taxation amount on *commonality* returned that only common answers, $\beta = 1.092$, $p < .001$, significantly predicted *commonality*. The final model that accounted for the effect of the taxation amount was significant, $F(2, 478) = 366.830$, $p < .001$, and accounted for 60.4% of the variance, *Adj*. $R^2 = .604$ (Appendix, Table 19). The regression model that examined the effect of the donation amount on *commonality* also indicated that only common answers, $\beta = 1.010$, $p < .001$, significantly predicted *commonality*. The final model that accounted for the effect of the donation amount was significant, $F(2, 473) = 262.220$, $p < .001$, and accounted for 52.4% of the variance, *Adj*. $R^2 = .524$ (Appendix, Table 20).

C. Discussion of Findings

a. *Main Hypotheses*

Given the lack of prior literature exploring the effect of economic situations on social distance, it is difficult to compare the results of the current study to the results of previous work, as the broad research questions of this work and prior work are different. However, the findings of this study were largely unexpected and did not support the hypotheses. Findings that the donation condition had no effect on *similarity* and *commonality* did not support Hypothesis One. Findings related to Hypothesis Two were mixed. Findings that the taxation and donation amounts did not have significant effects on *commonality* did not support Hypothesis Two. However, the finding that taxation amounts had a significant negative effect on *similarity* supported Hypothesis Two, and, though the effect was non-significant, the directionality of the positive effect of the donation amount on *similarity* was also consistent with Hypothesis Two. Notably, findings were stronger for the similarity question, something that is easily explained by the fact that the similarity question was a broader conceptualization of social distance, whereas the commonality question was numerically driven and may have had less potential to be affected by the economic situations.

These findings may indicate that there is no effect on perceived social distance of these two prosocial economic situations. However, this implication is surprising given the prior work that has found strong effects of social distance on donation (e.g., Hoffman et al., 1996; Charness & Gneezy, 2008), but the existing literature only examines the effect of social distance on the economic situation – the opposite-direction effect of this work – and does not include situations of taxation. Thus, it is plausible that relationships in the prior work should not be seen to inform predictions of the effects studied here.

This study's largest contribution was to establish the novel study framework used in this work, which allows for an effective comparison of situations of taxation and donation. This

framework was innovative in that the causal direction, as compared to prior work, was flipped, taxation and donation amounts were matched as closely as possible given the online setting, and the effect of the economic situation was isolated through the presentation of Person A's profile information *after* the economic setting. All these elements allowed this study to effectively compare taxation and donation, to evaluate the effect of the economic situations on perceived social distance, and to cleanly evaluate the hypotheses. Therefore, the method and structure used here is this work's largest accomplishment. Using the lessons learned in this work, future research should now use or adapt this framework to investigate this work's predicted effects and related ones. Though the statistical findings of this work were limited, the method established by this novel study is a considerable contribution to the field.

At present, though, it is difficult to draw many firm conclusions from this work given the somewhat mixed nature of the findings. Therefore, further research is necessary, particularly given several potential methodological issues with this work, which are discussed in the Limitations section. It is thus difficult to definitively state that these results imply that there is no significantly different effect of these economic situations on social distance. This emphasizes the need for replication of these findings, which could help to determine whether these effects are representative of real-world economic situations.

b. *Exploratory Findings*

The differences across the taxation and donation conditions in the time taken to complete the similarity and commonality questions yielded nearly significant results that indicated that donating may result in longer completion times. Logically, one might expect taxation to lead to longer completion times, as subjects in the taxation group had no active interaction with Person A and were considering Person A for the first time when answering the similarity and

commonality questions. Therefore, the finding that donation could lead to longer completion times could be contrary to expectations and may thus be compelling.

Further study using more robust timing measures is needed, but, if subjects consistently take longer to complete social distance questions after donating, there may be processing differences between the taxation and donation conditions. Especially in the context of the lack of significant differences in similarity and commonality between the taxation and donation groups and the large proportion of people who correctly guessed commonality, donation resulting in longer completion times may indicate that donation does influence people's social perceptions, but people might spend additional time comparing themselves to Person A and *override* the effect on social distance of the donation condition. This could help to explain the lack of significant differences in *similarity* and *commonality* between the taxation and donation groups, but future research using rigorous timing measures is necessary.

c. *Limitations*

Several methodological issues may have limited this study's ability to identify an effect of the taxation and donation situations on social distance. These limitations are important findings of this study, as it would not have been possible to learn about these limitations without first attempting the study, particularly because of the novel nature of the work.

i. Placement of Profile Information. Person A's profile information was shown to subjects after the economic situation and immediately before subjects rated their similarity and commonality with Person A. This was the only possible placement of Person A's profile information, as it was necessary to prevent Person A's information from affecting subjects' choices in the economic situation. However, the placement of Person A's profile information could have resulted in it being too easy for subjects to accurately assess their similarity and guess

their commonality with Person A. This explanation is especially plausible given that nearly 60% of subjects correctly answered the commonality question. Thus, the placement of Person A's profile information may have prevented any effect of the economic situations on social distance from being found in the data.

ii. Number of Questionnaire Items. The use of a four-item questionnaire may have also made it overly easy for subjects to remember Person A's profile information and reduced the potential for the economic situations to influence perceived social distance. Again, given the high proportion of subjects who accurately guessed their commonality with Person A, it is possible that subjects were too easily able to remember the four profile items and correctly judge their similarity and commonality with Person A. As with the placement of the social information, the use of such a short questionnaire (especially one with items such as political party and gender, which are likely to be very salient) may have eliminated much of the potential for the economic situations to differently influence perceived social distance.

iii. Online Format. Because the study was conducted online, subjects never truly interacted with Person A, other than seeing Person A's profile information. Despite attempts to personalize participants, real-world social characteristics may not have been mimicked by the experiment. The online format may have made social interaction and perception more difficult. Only a small subset of Person A's characteristics was revealed to subjects, potentially removing some of the social effects that were expected to influence social distance in the economic situations used in the study.

iv. Timing Tracking. Timing for the similarity and commonality questions was tracked using a built-in timer on Qualtrics that recorded the total time spent on a question. Especially given the wide range of completion times, it was impossible to know if subjects were

attentive to questions. Outliers were not removed because people who had taken too long to complete the entire study had already been removed, so it was difficult to assume that any subject was not attentive specifically to the similarity and commonality questions. Additionally, correct commonality answers were incentivized using bonus payments, so people may have had extra reason to spend time ensuring they answered accurately. It was thus difficult to determine whether these timing measures are accurate representations of the true time people spend considering questions of similarity and commonality.

VI. Conclusion

This study of the social effects of economic situations of taxation and donation yielded mixed results. The results *could* suggest that there is no difference in perceived social distance between situations of taxation and donation. However, the role of the *amount* of money transferred by taxation or donation may be important, as the amount of money transferred by taxation was found to predict one aspect of social distance – similarity. There might also be differences in social cognition, as measured by the time taken to answer social distance questions, when individuals transfer money to others by taxation or donation. Individuals who donate their money to others may require more time to consider their social distance with recipients.

The main results of this study suggest that there is no difference, in terms of social distance, between individuals who are taxed or donate their money to others. Given the other results that may complicate this picture, though, it is difficult to conclude for certain that the stated result is an absolute finding. If the effect is confirmed upon further investigation, it would imply that there is no difference in the way individuals who are taxed or donate their money see the recipient of their money. As taxation versus donation is an oft-debated topic in American

politics and popular culture, this result, if confirmed, could add to the discussion on these two types of prosocial money transfers. Primarily, the debate over taxation or donation would turn only toward the efficiency of these economic money transfers, as a lack of differences in social perception would make social concerns less practically important.

Overall, though, this study was successful in being the first to investigate the effect of two specific economic situations on social distance and establishing a rigorous framework to do so. This study therefore serves as a foundation study for the field, and there are many avenues of investigation to be pursued based on this research. The lack of significant effects found in this work should not be taken to mean that there is no effect of the economic situations on social distance. Rather, given the mixed findings of this work, the methodological limitations discovered by performing this study, and the strong opposite-direction relationship that exists in the literature, it is necessary to build upon the lessons learned in this work and to more rigorously conduct similar studies that will help to concretely determine the effects of economic situations on social distance.

Further research is needed, both to confirm the effects found in this study and to address the limitations that may have prevented this study from finding the true effects of the economic situations on social distance. Research should consider employing a *distraction task* between the display of the profile information and the social distance questions to make remembering Person A's profile information more difficult. Research should also consider using a seven- or 15-item questionnaire, as the four-item questionnaire used in this work may have also made remembering Person A's social information too easy. If possible, research should employ the framework used in this study in an in-person environment to encourage true social interactions between

participants. Research should also use more rigorous timing measures to determine if the timing effects suggested by these results truly exist.

Furthermore, research may explore the influence of individual differences on social distance in economic situations. Given the individually different theorized social orientations and individual values, people with prosocial social orientations and benevolent values (who are inclined to behave prosocially; Van Lange et al., 2010; Schwartz, 1992, as cited in Sneddon et al., 2020; Sagiv et al., 2011) may demonstrate the predicted differences in social distance in these economic situations. Thus, the predicted effects may exist for subgroups of people with certain orientations and values but may not exist in the general population. Research should consider determining subjects' social orientations, which would provide increased insight into the *types* of individuals who experience larger differences in social distance in situations of taxation and donation.

In extensions that move beyond the scope of the current work, research could also benefit from a rigorous *happiness* measure to determine how subjects feel about transferring their money to others, which would complete the picture of the social effects of the economic situations. Future work might also construct a more realistic donation setting to fully evoke the real-world feelings involved in donation. Such a setting could involve donating to a charity or a third party, who then transfers the money to the recipient, which may more effectively mirror the taxation condition and real-world charitable giving.

References

Andreoni, J. (1989). Giving with impure altruism: applications to charity and Ricardian Equivalence. *Journal of Political Economy, 96(*6), 1447-1458. https://www.jstor.org/stable/1833247#metadata_info_tab_contents

Akerlof, G. A. & Kranton, R. E. (2000). Economics and identity. *The Quarterly Journal of Economics, 115*(3), 715-753. https://go.gale.com/ps/i.do?p=EAIM&u=duke_perkins&id=GALE%7CA65145109&v=2.1&it=r&sid=summon

Bischoff, I. & Krauskopf, T. (2015). Warm glow of giving collectively – An experimental study. *Journal of Economic Psychology, 51*, 210-218. https://doi.org/10.1016/j.joep.2015.09.001

Bohnet, I. & Frey, S. (1999). Social distance and other-regarding behavior in dictator games: Comment. *American Economic Review, 89*(1), 335-339. https://www.jstor.org/stable/116993?seq=1

Charness, G. & Gneezy, U. (2008). What's in a name? Anonymity and social distance in dictator and ultimatum games. *Journal of Economic Behavior & Organization, 68,* 29-35. https://doi.org/10.1016/j.jebo.2008.03.001

Chen, Y. & Li, S. X. (2009). Group identity and social preferences. *American Economic Review, 99*(1), 431-457. https://doi.org/10.1257/aer.99.1.431

Cherry, T.L., Frykblom, P., & Shogren, J. F. (2002). Hardnose the dictator. *American Economic Review, 92*(4), 1218-1221. Retrieved from: https://www.proquest.com/scholarly-journals/hardnose-dictator/docview/233025083/se-2?accountid=10598

Crumpler, H. & Grossman, P. J. (2008). An experimental test of warm glow giving. *Journal of Public Economics, 92,* 1011-1021. https://doi.org/10.1016/j.jpubeco.2007.12.014

Engel, C. (2011). Dictator games: A meta study. *Experimental Economics*, *14*, 583-610. https://doi.org/10.1007/s10683-011-9283-7

Fromell, H., Nosenzo, D., & Owens, T. (2020). Altruism, fast and slow? Evidence from a meta-analysis and a new experiment. *Experimental Economics, 23*, 979-1001. https://doi.org/10.1007/s10683-020-09645-z

Guala, F. & Mittone, L. (2010). Paradigmatic experiments: The Dictator Game. *The Journal of Socio-Economics, 39*(5), 578-584. https://doi.org/10.1016/j.socec.2009.05.007

Hagenbach, J., Kranton, R., & Lee, V. (2022). *Motivated identity and self-presentation* [In progress]. Department of Economics, Sciences Po, Paris, France. Department of Economics, Duke University, Durham, North Carolina.

Hoffman, E., McCabe, K., & Smith, V.L. (1996). Social distance and other-regarding behavior in dictator games. *The American Economic Review, 86*(3), 653-660. https://www.jstor.org/stable/2118218?seq=1

Korenok, O., Millner, E., & Razzolini, L. (2017). Feelings of ownership in dictator games. *Journal of Economic Psychology, 61,* 141-151. https://doi.org//10.1016/j.joep.2017.04.003

Leider, S., Möbius, M. M., Rosenblat, T., & Do, Q. (2007). *Directed altruism and enforced reciprocity in social networks: How much is a friend worth* (NBER Working Paper No. 13135). National Bureau of Economic Research. https://www.nber.org/system/files/working_papers/w13135/w13135.pdf

National Philanthropic Trust. (n.d.). *Charitable giving statistics*. https://www.nptrust.org/philanthropic-resources/charitable-giving-statistics/

Organisation for Economic Co-operation and Development. (n.d.). *Revenue statistics 2021 – The United States*. https://www.oecd.org/tax/revenue-statistics-united-states.pdf

Oxoby, R. J. & Spraggon, J. (2008). Mine and yours: Property rights in dictator games. *Journal of Economic Behavior & Organization, 65,* 703-713. https://doi.org//10.1016/j.jebo.2005.12.006

Sagiv, L., Sverdlik, N., & Schwarz, N. (2011). To compete or to cooperate? Values' impact on perception and action in social dilemma games. *European Journal of Social Policy, 41*(1), 64-77. https://doi.org/10.1002/ejsp.729

Sneddon, J. N., Evers, U., & Lee, J. A. (2020). Personal values and choice of charitable cause: An exploration of donors' giving behavior. *Nonprofit and Volunteer Sector Quarterly*, *49*(4), 803-826. https://doi.org/10.1177/0899764020908339

Small, D. A. & Simonsohn, U. (2008). Friends of victims: Personal experience and prosocial behavior. *Journal of Consumer Research, 35*(3), 532-542. https://jstor.org/stable/10.1086/527268

Tajfel, H., Billig, M. G., Bundy, R. P., & Flament, C. (1971). Social categorization and intergroup behaviour. *European Journal of Social Psychology, 1*(2), 149-178. https://doi.org/10.1002/ejsp.2420010202

Tax Foundation. (January 20, 2022). *Summary of the latest federal income tax data, 2022 update*. Retrieved February 14, 2022 from https://taxfoundation.org/summary-latest-federal-income-tax-data-2022-update/.

Philanthropy Roundtable. (n.d.). *Who gives most to charity?* https://www.philanthropyroundtable.org/almanac/statistics/who-gives

USAspending DATALAB. (n.d). *Revenue and GDP. https://datalab.usaspending.gov/americas-financeguide/revenue/#:~:text=In%20Fiscal%20Year%202021%2C%20federal,that%20year%20(%2422.39%20trillion)*

Van Lange, P. A. M., Bekkers, R., Schuyt, T. H. M, & Van Vugt, M. (2010). From games to giving: Social value orientation predicts donations to noble causes. *Basic and Applied Psychology*, *29*(4), 375-384. https://doi.org/10.1080/01973530701665223

Wark, C. & Galliher, J. F. (2007). Emory Bogardus and the origins of the Social Distance Scale. *The American Sociologist*, *38*, 383-395. https://doi.org/10.1007/s12108-007-9023-9

Zaki, J. & Mitchell, P. (2013). Intuitive prosociality. *Current Directions in Psychological Science*, *22*(6), 466-470. https://doi.org/10.1177/0963721413492764

Appendix

Table 1

Description of Variables

Variable	Label	Description	Type	Predicted Effect	Predicted Effect Rationale
Descriptive Variables					
age	Age	2021 – birth year	Numerical	*	*
birthyear	Birthyear	Subject's birth year	Numerical	*	*
education	Education Level	Highest education level completed	Categorical	*	*
education_num	Education Level	c_04_education in numerical format	Numerical	*	*
Questionnaire Variables					
g_2_female	Gender	gender	Categorical	*	*
gender_1_num	Gender	non-binary grouped with male; gender in numerical format	Numerical	*	*
gender_2_num	Gender	non-binary grouped with female; gender in numerical format	Numerical	*	*
g_4_marriage	Marital Status	marital status	Categorical	*	*
marriage	Marital Status	g_4_marriage in numerical format	Numerical	*	*
g_5_polpartydem	Party Leaning	Political party leaning	Categorical	*	*
political_party	Party Leaning	g_5_polpartydem in numerical format	Numerical	*	*
g_8_seasonfall	Season Preference	preference between spring and fall	Categorical	*	*
season	Season Preference	g_8_seasonfall in numerical format	Numerical	*	*
Dependent Variables					
commonality	Commonality	commonality rating	Numerical	+ w/ donate_dummy; + w/ Donation Amount; - w/ Taxation Amount	Donation will result in higher commonality; higher donation (taxation) amounts will result in greater (smaller) commonality

Variable	Label	Description	Type	Predicted Effect	Predicted Effect Rationale
similarity	Similarity	similarity rating	Numerical	+ w/ donate_dummy; + w/ Donation Amount; - w/ Taxation Amount	Donation will result in higher similarity ratings; higher donation (taxation) amounts will result in greater (lower) similarity
Independent/Control Variables					
common_answers	Actual Common Answers	actual common answers between subject and Person A	Numerical	+ w/ similarity, commonality	similarity/commonality should be objectively related to actual common answers
common_pagesubmit	Commonality Page Submit	time to rate commonality	Numerical	*	*
donate_dummy	Donate	indicator for donation condition	Numerical	+ w/ similarity, commonality	Predicted that donation will cause higher similarity, commonality ratings
gap_abs	Guess Gap	absolute value of the difference between actual common answers and the commonality rating	Numerical	*	*
transfer	Transfer Method	indicates transfer by taxation or donation	Categorical	+ w/ similarity, commonality	Predicted that donation will cause higher similarity, commonality ratings
transfer_amount	Transfer Amount	amount transferred by subject	Numerical	+ w/ similarity/ commonality	Predicted higher donation (taxation) amounts will cause greater (lower) similarity/commonality
transfer_centered	Mean Centered Transfer Amount	mean centered transfer amount to be used in interaction only	Numerical	*	*
similar_pagesubmit	Similarity Page Submit	time to submit similarity question	Numerical	*	*

Note. Several variables have the same label because the content of the variables is the same, with one being in numerical format and the other being in categorical format.

Note. * signifies that a variable is useful to include but does not have a specific predicted effect. Relationships involving these variables were explored in the exploratory analyses, but these variables were not the focus of this work, and, thus, no predictions were made for relationships involving these variables.

Table 3

Descriptive Statistics of the Sample

Baseline Characteristic	Full Sample ($N = 957$)	
	n	%
Descriptive Variables		
education		
Less than high school degree	8	0.840
High school graduate	93	9.720
Some college but no degree	220	22.990
Associate degree	69	7.210
Bachelor's degree	405	42.320
Master's degree	122	12.750
Doctoral degree	20	2.090
Professional Degree	20	2.090
Questionnaire Items		
g_2_female[a]		
Male	463	48.380
Female	469	49.010
Non-binary	25	2.610
g_4_marriage		
Married or in a domestic partnership	475	49.630
Not married or in a domestic partnership	482	50.370
g_5_polpartydem		
Democratic party	695	72.620
Republican party	262	27.380
g_8_seasonfall		
Fall	598	62.490
Spring	359	37.510
Dependent Variables		
similarity		
1 (Not similar at all)	82	8.570

Baseline Characteristic	Full Sample ($N = 957$)	
	n	%
2 (Not similar)	193	20.170
3 (Neutral)	165	17.240
4 (Similar)	384	40.130
5 (Very similar)	133	13.900
commonality		
0 answers	272	28.420
1 answer	0	0
2 answers	251	26.230
3 answers	281	29.360
4 answers	153	15.990
Independent/Control Variables		
actual common answers		
0	49	5.120
1	206	21.530
2	350	36.570
3	260	27.170
4	92	9.610

Note. All the questionnaire items and *education* also have corresponding numerical variables that were created for the purposes of analyses. Thus, the distributions of the categorical variables presented here also correspond to the distributions of the corresponding numerical variables.

[a] The study sample was collected simultaneously in two halves in order to collect a relatively equal number of male and female participants. Non-binary groups were included in both collection groups.

Table 6

Descriptive Statistics and Correlations for Main Variables

Variable	*n*	*M*	*SD*	1	2	3	4	5	6	7	8	9
1. donate_dummy	957	0.497	0.500	-	-	-	-	-	-	-	-	-
2. common_answers	957	2.146	1.028	-.005	-	-	-	-	-	-	-	-
3. transfer_amount	957	0.195	0.251	-.043	.009	-	-	-	-	-	-	-
4. similarity	957	3.306	1.187	-.030	.680**	-.012	-	-	-	-	-	-
5. commonality	957	2.045	1.439	.015	.753**	.006	.682**	-	-	-	-	-
6. gender_1_num[a, b]	957	0.516	0.500	.005	-.035	-.024	-.048	.003	-	-	-	-
7. marriage[c]	957	0.496	0.500	-.014	-.174**	-.025	-.115**	-.152**	.058	-	-	-
8. political_party[d]	957	0.726	0.446	.044	.295**	.028	.279**	.259**	-.083**	-.131**	-	-
9. season[e]	947	0.625	0.484	-.019	.159**	.007	.093**	.113**	-.081*	-.090**	.062	-

[a] For the purposes of the correlations, non-binary was grouped into male. The correlations were similar when non-binary was grouped into female.

[b, c, d, e] For the purposes of the correlation matrix, all the questionnaire items were used in their numerical format. Therefore, *gender_1_num* represents *g_2_female*, *marriage* represents *g_4_marriage*, *political_party* represents *g_5_polpartydem*, and *season* represents *g_8_seasonfall*.

* $p < 0.05$, ** $p < 0.01$

As expected, similarity and commonality were strongly positively correlated. Political party leaning was also moderately positively correlated with both similarity and commonality, indicating that political party may predict similarity and commonality ratings. Notably, there was no strong correlation between any of the questionnaire items. This was an intended result; the four included questionnaire items were selected because they were weakly correlated in a prior pilot study.

Table 13

Regression Analysis: Effect of Donation Condition on Similarity

Effect	Estimate	*SE*	95% CI		*p*
			LL	*UL*	
Intercept	1.669	0.075	1.522	1.816	<.001**
transfer_amount	-0.091	0.112	-0.311	0.130	.419
common_answers	0.786	0.027	0.732	0.839	<.001**
donate_dummy[a]	-0.063	0.056	-0.174	0.047	.262

Note. $F(3, 953) = 274.490, p < .001$**, $R^2 = .464$, *Adj*. $R^2 = .462$

[a] The variable *donate_dummy* refers to an indicator variable that takes the value 1 when the subject was assigned to the donation condition and 0 when the subject was assigned to the taxation condition.

** $p < 0.01$

Table 14

Regression Analysis: Effect of Donation Condition on Commonality

Effect	Estimate	*SE*	95% CI		*p*
			LL	*UL*	
Intercept	-0.245	0.081	-0.405	-0.086	.003**
transfer_amount	0.002	0.122	-0.238	0.242	.986
common_answers	1.054	0.030	0.995	1.112	<.001**
donate_dummy[a]	0.056	0.061	-0.064	0.176	.362

Note. $F(3, 953) = 415.48, p < .001$**, $R^2 = .567$, *Adj*. $R^2 = .565$

[a] The variable *donate_dummy* refers to an indicator variable that takes the value 1 when the subject was assigned to the donation condition and 0 when the subject was assigned to the taxation condition.

** $p < 0.01$

Table 15

Regression Analysis: Predictors of Similarity Including Interaction Term

Effect	Estimate	*SE*	95% CI		*p*
			LL	*UL*	
Intercept	1.620	0.078	1.468	1.773	<.001**
transfer_amount	0.155	0.158	-0.155	0.464	.327
common_answers	0.787	0.027	0.734	0.841	<.001**
donate_dummy[a]	-0.063	0.056	0.164	0.047	.261
transfer_centered × donate_dummy					
0	-0.497	0.224	-0.937	-0.057	.027*
1[b]	0	(omitted)			

Note. $F(4, 952) = 207.940, p < .001^{**}, R^2 = .466, Adj.\ R^2 = .464$

[a] The variable *donate_dummy* refers to the indicator variable for the donation condition.

[b] This response was omitted due to collinearity between *donate_dummy* and the transfer amount in the donation condition.

* $p < 0.05$ ** $p < 0.01$

Table 16

Regression Analysis: Effect of Taxation Amount on Similarity

Effect	Estimate	*SE*	95% CI		*p*
			LL	*UL*	
Intercept	1.704	0.098	1.511	1.897	<.001**
common_answers	0.794	0.039	0.717	0.870	<.001**
taxation amount	-0.343	0164	0.995	-0.020	.037*

Note. $F(2, 478) = 208.960, p < .001^{**}, R^2 = .467, Adj.\ R^2 = .464$

* $p < .05$ ** $p < .01$

Table 17

Regression Analysis: Effect of Donation Amount on Similarity

Effect	Estimate	*SE*	95% CI		*p*
			LL	*UL*	
Intercept	1.572	0.096	1.384	1.760	<.001**
common_answers	0.780	0.038	0.705	0.857	<.001**
donation amount	0.154	0.153	-0.146	0.454	.314

Note. $F(2, 473) = 205.700, p < .001^{**}, R^2 = .465, Adj.\ R^2 = .463$

* $p < .05$ ** $p < .01$

Table 18

Regression Analysis: Predictors of Commonality Including Interaction Term

Effect	Estimate	*SE*	95% CI		*p*
			LL	*UL*	
Intercept	-.220	0.084	-0.387	-0.054	.009**
common_answers	1.053	0.030	0.994	1.112	<.001**
transfer_amount	-0.123	0.172	-0.460	0.215	.476
donate_dummy[a]	0.056	0.061	-0.064	0.176	.362
transfer_centered × donate_dummy					
0	0.253	0.245	0.228	0.733	.302
1[b]	0	(omitted)			

Note. $F(4, 952) = 311.900$, $p < .001$**, $R^2 = .567$, *Adj*. $R^2 = .565$

[a] The variable *donate_dummy* refers to the indicator variable for whether the subject was in the donation condition.

[b] This response was omitted due to collinearity between *donate_dummy* and the transfer amount in the donation condition.

** $p < 0.01$

Table 19

Regression Analysis: Effect of Taxation Amount on Commonality

Effect	Estimate	*SE*	95% CI		*p*
			LL	*UL*	
Intercept	0.353	0.102	-0.553	-0.153	<.001**
common_answers	1.092	0.040	1.013	1.172	<.001**
taxation amount	0.124	0.171	-0.211	0.460	.466

Note. $F(2, 478) = 366.830$, $p < .001$**, $R^2 = .606$, *Adj*. $R^2 = .604$

** $p < .01$

Table 20

Regression Analysis: Effect of Donation Amount on Commonality

Effect	Estimate	*SE*	95% CI		*p*
			LL	*UL*	
Intercept	-0.071	0.110	-0.287	0.145	.517
common_answers	1.010	0.044	0.923	1.096	<.001**
donation amount	-0.126	0.175	-0.470	0.219	.474

Note. $F(2, 473) = 262.220$, $p < .001$**, $R^2 = .5258$, *Adj*. $R^2 = .524$

** $p < .01$