

STOCKHOLM SCHOOL OF ECONOMICS

Department of Economics

5350 Master's thesis in economics

Academic year 2019-2020

Giving It All: The Impact of a Minimum Restriction on Donor Behavior

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Abstract: This paper uses a standard dictator game approach where each subject takes the role of the dictator and the counterpart is a charitable organization in order to explore changes in behavior following the introduction of minimum donation amount. While individuals in the control group could select any donation they wanted and keep the rest of the endowment, participants in the treatment group had to donate at least 30% of the endowment if they chose to donate. The results indicate that the introduction of a minimum in this setting did not significantly alter neither the number of donations nor the average donation. One effect of the minimum restriction appears instead to have been inducing those who would have otherwise donated below the minimum to donate at or slightly above the minimum. However, since this did not result in an increase in the overall mean, either the positive effect is small and this experiment did not have sufficient power to detect it in the full sample, or there are additional behavioral effects of the minimum being introduced which reduces donation amounts. Behavioral theories of warm glow and anchoring might be explanations of the observed results. Overall, the results provide preliminary evidence indicating that while a charity should not expect increased donations following the introduction of a minimum donation amount, it should not necessarily expect donations to drop significantly neither.

Keywords: Charitable giving, Pay-what-you-want, Minimum restriction, Anchoring, Warm glow

JEL: C14, C91, D01, D91

Supervisor: Magnus Johannesson

Date submitted: 2020-05-18

Date examined: 2020-05-26

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Examiner: Kelly Ragan

Acknowledgments

I must express my gratitude towards my supervisor, Magnus Johannesson. For his incredible availability, for his patience with my e-mails, my many discarded ideas of topics and designs, and for his invaluable feedback. He has been an excellent teacher of how to conduct an experiment as well as being enormously helpful in the writing of this thesis.

I also want to thank my friends and family who have been there to support me, reading through my drafts and providing me with feedback. Without them, there would have been no thesis and they have made sure that I have no excuse - apart from my own lack of creativity - for not writing a better one.

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1 Introduction

In 2018, American citizens, companies and foundations together donated an estimated \$427.71 billion to U.S. charities, an amount equivalent to the GDP of Norway (Giving USA, 2019). It might come as a surprise that the famously individualistic land of the free and home of the brave spent as much on charities in 2018 as the net worth of one of the thirty largest economies in the world (World Bank, 2019). Actually, when studying economic theory, it might come as a surprise that anyone donates to charity at all. As Andreoni (2006) put it:

Philanthropy is one of the greatest puzzles for economics. A science based on precepts of self-interested behavior does not easily accommodate behavior that is so clearly unselfish.

Charitable giving has been a field of interest in behavioral economics for several decades at this point and even though there has been much research done and there are several theories of why people donate to charity, there is still no single answer as to what motivates donor behavior. This study will not provide that theory. But it will attempt to expand the current understanding of donor behavior by exploring previously untested restrictions on donations, perhaps providing one new piece to the grand puzzle that is charitable giving.

Charitable giving is often viewed as separate from theories of what drives individuals' purchasing decisions. Since a purchase should by definition provide the buyer with something in return, that separation seems reasonable. Donating to a charity does in most cases not provide the donor with anything in return. However, there are areas where donating and purchasing almost overlap, and one such setting is pay-what-you-want (PWYW). In 2007, the band Radiohead decided to allow fans to download their new album "In Rainbows" from their website with the price of the album being anything the customers wanted - including nothing (Gneezy, Gneezy, Riener, & Nelson, 2012). Standard economic theory provides a simple answer to what the band was estimated to make by using this scheme: nothing. Standard economic theory was wrong and Radiohead collected hundreds of thousands of dollars on record sales (Bourreau, Doğan, & Hong, 2015). Since then, the literature on PWYW has rapidly increased, attempting to explain the reason why people would choose to pay for something they can get for free and exploring what behavioral factors might be relevant (for examples see Isaac, Lightle, and Norton (2015), Kim, Natter, and Spann (2009), for an overview: Natter and Kaufmann (2015), and Regner (2015)). Johnson and Cui (2013) explore what happens when a number of external price references are introduced in a PWYW setting, including a suggested price, a maximum price and minimum price restriction (you can pay what you want but you have to pay at least or at most \$X). Their results indicate that both a maximum as well as a minimum restriction leads to a lowering of the average amount paid.

The initial findings of Johnson and Cui (2013) poses interesting questions. Why would people pay less for something when a minimum was introduced compared to when they could have selected any amount they wanted to? Perhaps the sense of paying what you want is impacted by the fact that you actually can no longer pay what you want, and that constraint causes individuals to

pay less. Perhaps the pressure of coming up with your own price is relieved by the minimum giving you a suggestion. Perhaps the minimum becomes interpreted as a price and the PWYW part of the transaction only adds the option of giving extra if you feel like it. But what about a situation where, no matter the amount you choose, you are always giving and not receiving anything back? Could a minimum restriction still have similar effects? While there is much literature on charitable giving, none of the most prominent theories provides neither a clear answer nor prediction as to what would happen in that situation. As such, the purpose of this paper is to fill that gap in the research concerning charitable giving by studying the impact on donor behavior of introducing a minimum restriction - a minimum amount that must be donated if you choose to donate. In addition to the potential theoretical implications of this study, the findings of exploring the research question could provide important guidelines for policy as well; assisting charitable organizations by suggesting whether a minimum restriction reduces average donations and should be avoided, has no impact at all or raises average donations and could be used to increase donations. Formally, the research question of this paper is:

- What is the impact on the average donation of introducing a minimum donation amount?

To test this question, this paper utilizes the experiment design of a standard dictator game in which participants are asked to take the role of a dictator deciding how to split an endowment between themselves and a charitable organization (Save the Children Sweden). The experiment was carried out via an online survey sent out to students at the Stockholm School of Economics. A total of 534 participants were randomly split into two groups; one group playing the dictator game described above and the other playing the same game but with the restriction that if they chose to donate, they had to give at least 30% of the endowment.

The fundamentals of the study design, including research question, methodology, and statistical analysis were pre-registered on the Open Science Framework (OSF) prior to commencing the experiment.¹ There are several benefits to pre-registration, including reducing the risk of p-hacking, preventing hindsight bias and strengthening the credibility of the paper (Nosek, Ebersole, DeHaven, & Mellor, 2018). In the pre-registration, the main hypothesis - that average donations will differ between the treatment and control group - was stated and motivated, along with the motivation for the exploratory analysis conducted.

The results of testing the main hypothesis indicate that there is no statistically significant difference between average donations in the control and treatment group respectively. Furthermore, the results from the exploratory analysis show no statistically significant difference in the number of donations between the two groups. However, there is a statistically significant increase in donations of the minimum and the equal split in the treatment group compared to the control group. The results indicate that one effect of introducing a minimum is inducing individuals who would have otherwise donated below the minimum to donate at the or slightly above the minimum. While there are limitations in terms of policy implications due to the experimental setting, the results indicate that charities could potentially institute minimum restrictions on

¹The entire pre-registration can be found in the appendix as well as at this link: <https://osf.io/2fyxb>.

donations without affecting neither the willingness to donate nor the average contribution of donors.

The structure of this paper is as follows: the next section will contain an overview of the previous research in the fields relevant for the study design. The third section details the experiment design and formally states the hypothesis along with the statistical methods used as well as the exploratory analysis conducted. In the fourth section summary statistics and results from the experiment are presented, the fifth section contains discussion and analysis of those results and the sixth and final section concludes.

2 Theoretical framework

This study relies upon theories and previous research in several areas of behavioral economics and throughout this section these fields will be covered. First there will be a brief background on dictator games upon which the experiment design is based, then different theories of charitable giving will be discussed and finally a few behavioral theories central for the discussion will be presented; loss aversion, reference prices, anchoring and crowding out.

2.1 The dictator game

Versions of the dictator game are frequently used in the field of behavioral economics to test a range of behavioral phenomena including - but not limited to - altruism, reciprocity, guilt aversion and social image (Engel, 2011). The setup of the game is simple; one player (the dictator) is given an endowment and is then asked to split this endowment between herself and another player (the responder). The standard economic prediction of the outcome is simple: the dictator should keep the entire endowment to maximize own utility. But studies have found that those outcomes are rare - Engel (2011) shows in a meta-analysis that in only 6 out of 616 treatments do the dictators give nothing on average, and across all 616 studies dictators on average give 28.35% of the endowment (Engel, 2011). These results are robust regardless of the demographics of the subjects or stakes. Following this robust finding, the obvious question is why we observe this outcome. Some theories of dictator game giving focus on the presence of a counterpart - the fact that the decision you make impacts someone else's outcome induces people to give. One such example is found in Hoffman, McCabe, and Smith (1996) where the authors examine how offers change by altering the social distance between the dictator and the responder. Hoffman et al. (1996) show that social distance does impact offers (more social distance equaling higher degrees of anonymity, resulting in less fair splits) indicating that it is a motivating factor of dictator game giving, a result that has held up in subsequent studies (Engel, 2011). While interesting, these theories will not be factoring into the participants' decisions since there is no human counterpart in the experiment in this particular study. A version of the dictator game where a charity rather than a person is the counterpart - which can be referred to as the charity game - was first introduced by Eckel and Grossman (1996). They compared the outcomes of donations in the standard dictator game and the donations when an anonymous other participant was replaced with the American Red Cross. Eckel and Grossman (1996) found that donations tripled when the recipient was a charity compared to when donating to another person and they use this result to argue that altruism is a driving factor in dictator game giving. As such, a brief overview of altruism along with other theories of charitable giving in general, will be covered in the next section.

2.2 Charitable giving

The quote from Andreoni (2006) used in the introduction implied that conventional economic theory struggles with explaining behavior that is wholly unselfish, like charitable giving. Perhaps as a result of this, there are many theories of charitable giving that are not reliant upon donating as an unselfish act at all - at least not unselfish in the sense that it reduces personal utility in order to benefit others. Because within the framework used to explain charitable giving below,

even behavior of pure altruism - which in general terms can be used to describe an action that only benefits others, sometimes to the detriment of oneself - will be motivated by a gain in utility for the altruist. And this concept extends to other motivations for giving: perhaps donating induces a good feeling about oneself - a warm glow - that increases personal utility no matter how beneficial the actual donation is to those who receive it. Or perhaps the main motivation for giving is to receive praise from peers or avoiding scrutiny from others for not giving - indicating that donations are driven by a desire to maintain a social image rather than anything else. And while this study does not focus on why people give in the first place, since the purpose is to further the understanding of charitable giving and the hypothesis testing will be motivated by certain behavioral effects that in turn depend upon theories of charitable giving, a brief discussion of these three theories of giving is necessary; starting with altruism, followed by warm glow and finally social image.

2.2.1 Altruism

Batson (1991) defines altruism as "...a motivational state with the ultimate goal of increasing another's welfare.". He continues to pose that using this definition, an altruistic action does not require self-sacrifice. In other words, in order to be altruistic, a person donating to charity does not need to experience a decrease in utility and in fact, the theories presented below will be based upon the assumption that charitable giving either keeps the donor at the same level of utility or increases donor utility. What will differ between the models will be what provides this gain in utility that equals or outweighs the loss of utility caused by the decrease in resources following a donation. The first source of gained utility from donating could be if an individual donates to a charity or public good that the donor will enjoy the benefits from. To illustrate by borrowing some examples from Andreoni (2006); an individual who gives to medical research might do so hoping to one day enjoy the benefits of future findings, or a donation to poverty relief might be motivated by the hope that the institution remains in the event of oneself needing it to survive. Thinking about altruism in this way, where individuals donate to a public good that they are (or will be) benefiting from, it is possible to use a simple example to show the potential outcomes (Andreoni, 2006). If all individuals with an income have two choices; consume all of it or donate some to a public good that they themselves benefit from, what would be the outcome? Each individual would in that case have a personal optimal amount that in total would be donated to that public good - a point at which they themselves do no longer gain in utility by taking from their income and giving to the public good. If an individual donates only to enhance personal well-being and observes that the public good already is funded at the optimal level, then there is no motivation to donate. As such, in this framework, individuals desire to give can be crowded out by others' donations.

If donors, rather than directly benefiting from the cause they donate to, gain utility because the utility of others increase, that would be a different motivator for altruistic giving which can be referred to as pure altruism. Again, the individual does not experience a decrease in utility as long as the perceived utility gain of others outweigh the decreased utility resulting from the resource loss (Andreoni, 2006). A keyword here though is "perceived" because often in these situations - for instance when donating to a charity benefiting individuals on another continent -

it is difficult for the donor to actually observe the increased utility of the recipients. In those situations, the donor must form a belief about the utility gains of the recipients, which still might outweigh the cost of the donation, but it does induce a notion of uncertainty into the utility function of the donor. In other words, a purely altruistic giver might still donate to charity, but if uncertainties about the eventual benefits are large, the likelihood of donating might decrease. In those situations, an alternative theory of donation behavior might be necessary, which will be discussed in the next part.

One remark before moving to the next model however. As was stated in the beginning of this section, these theories are based upon the assumption that individuals do not experience a decrease in utility as a result of donating. This facilitates economic modelling, but it does not mean that it is true - individuals might donate to charity even if they lose utility by doing so. Charitable giving might be based upon different motivations (moral reasons for instance) and driven by desires which cannot be captured in these theories and models in which individuals attempt to maximize own utility (Andreoni, 2006). That is not to say that any of the models presented are useless or wrong, but that they might be incomplete or attempts at explaining a behavior that is actually motivated by completely different reasons.

2.2.2 Warm glow

If altruism using the definition from Batson (1991) is dependent upon the idea of increasing the utility of other individuals, what drives charitable giving in situations where uncertainties about recipient welfare are large? Is it even plausible that all individuals who donate to charity do it only to increase the welfare of others? As a response to questions like these, the theory of warm glow was developed (Andreoni, 2006). The fundamental idea of the theory of warm glow is that it is the giving in itself that provides the utility for the donor rather than whatever happens with the actual donation. In other words, people donate to charities because they feel good about themselves for doing it - they experience a "warm glow" by giving. Contrasting this to pure altruism in which individuals gain utility by observing or forming beliefs about the increased utility of others as a result of a donation, for a warm glow giver, the question of whether the actual donations ever achieve their intended purpose is secondary since the utility comes from the act of giving itself. An individual that cares both about the outcome of their donation as well as the warm glow experienced by donating can be referred to as an impurely altruistic giver (Andreoni, 1990).

Using the example from before with a public good that the individual both donates and benefits from, in contrast to altruism, the theory of warm glow provides incentive for giving regardless of the current amount donated to the public good. For instance, if an individual observes their optimal amount already having been donated to the public good, if they were donating using the theory of altruistic giving from earlier, they would not donate. However, if the utility gained from donating is larger than the utility loss of decreasing income,² then an individual could still choose to donate. In that case, the warm glow of giving provides more utility than a monetary loss decreases utility. In other words, others' donations are not a perfect substitute for personal

²Assuming for simplicity that more funds to the public good above the optimum does not increase personal utility.

donations. The result implies that the crowding out of one's personal donations should not be as large of an issue if charitable giving is primarily driven by warm glow. In a setting where an individual's personal donation only is a small contribution to the size of a public good or the yearly earnings of a charity (as it would be in most real-world situations) an individual has little altruistic incentive to donate, but the incentives from warm glow still remains (Andreoni, 2006).

The experiment design in this paper where the charity will not benefit any of the participants makes the version of altruism in which donors experience direct gains from donating an unfeasible motivation for observing donations. And even if the charity did benefit the participants, the size of the charity would likely crowd out this motivation as well. The number of purely altruistic givers are likely reduced slightly due to the payout structure of the experiment which introduces additional levels of uncertainty into their individual utility functions.³ However, since both pure and impure altruism is dependent upon the individual utility function it is difficult to rule out either motivation when observing the results. For instance, if the observed result show that individuals in the treatment group choose to donate at or slightly above the minimum, that would be consistent with the idea of warm glow where donating anything - regardless if the amount is higher than preferred - might outweigh giving nothing. However, a purely altruistic giver who would gain utility from giving below the minimum might still gain utility from giving at the minimum and thus the results could be explained by that theory as well. However, while both theories might motivate behavior of those donating below the minimum, neither the theory of impure nor pure altruism provide a clear prediction as to what happens to individuals donating above the minimum.

2.2.3 Social image

The final model of charitable giving to be introduced is one where giving is not motivated by a personal well-being or caring that those who receive the donations are better off, but rather to avoid social scrutiny from others or to reap social benefits. There have been several experiments conducted showing that the knowledge of others donating, the knowledge of the amount they donate as well as how it compares to your own donation impacts willingness to donate and the level of contributions (Reyniers & Bhalla, 2013). To illustrate, Reyniers and Bhalla (2013) perform an experiment where a control group of participants in an experiment are asked whether they want to donate part of their show-up fee to charity while in the treatment group, participants are asked the same question but they are also paired with a partner and informed that their partner will become aware of their decision. The paired subjects are then to discuss their respective first donation amounts and then make a final decision about their contributions. The authors find not only that subjects who are aware that their donation amount will be revealed to someone else donate significantly more than the control group in the first stage, but after conferring with a partner, those with large discrepancies between their donations (one donating low while the other donates high) both adjust their final donation decisions towards one another (Reyniers & Bhalla, 2013). They also find that while paired subjects on average gave more, they were less happy about their decision - indicating that they might have felt coerced

³The payout structure of the experiment as will be described in Section 3.1 specifies that only three out of all participants will be selected for payoff where their choices in the experiment are realized.

to give more by their peer. A theory of warm glow or altruism in which an individual donates based solely upon their own internal motivators struggles to reconcile with results such as these.

In order to explain results such as the ones described in the previous paragraph, several models of individual behavior have been suggested that combines altruism with a concern for social image. One example is the model proposed by Bénabou and Tirole (2006). The model covers many different aspects but for the purposes of the study conducted in this paper one key prediction of the model is that “a greater prominence and memorability of contributions strengthens the signaling motive and thus generally encourages prosocial behavior” (Bénabou & Tirole, 2006). In other words, if your contribution will become known to others, your incentive to raise your donation increases which would explain the results found in Reyniers and Bhalla (2013). For the experiment in this study, this finding suggests that should participants’ choices become known following the data collection procedure, incentives to donate larger amounts would increase. Not only because of the value of signaling that is associated with donating most or all of the endowment, but also to avoid the scrutiny related to appearing greedy by donating a small or no part of the endowment. Ellingsen and Johannesson (2008) similarly demonstrates the desire for individuals to gain social esteem by constructing a model where individual utility is not only gained by appearing generous for instance, but also by displaying this prosocial behavior to others who have also displayed the same generous behavior. They use this model to explain behavior in different principal-agent settings. In addition to Bénabou and Tirole (2006), the model of Ellingsen and Johannesson (2008) also suggests that not only do you want to appear as a good person to your peers, but if you know (or believe) others around you to also be generous, the motivation to appear generous increases further. The implication for this paper being that if a participant in the experiment perceives others to be generous, their incentives to be generous increases. As demonstrated by these models, social image might be an important factor that increases average donations, both in the control and the treatment group.

The idea that social image is an important part of what drives donor behavior is relevant for this study for several reasons. First of all, as suggested in the paragraph above, if individual choices were to be made public following the data collection procedure, many participants would probably weigh the risk of seeming greedy to their peers (or the chance to appear generous) as more important than anything else. As such, incentives to donate at the upper end of the spectrum would be large and the risk would then be that no discernible difference is found when comparing the control and treatment group because the impacts of social image would dominate the impact of a minimum restriction. Evidence of this is provided by Andreoni and Bernheim (2009) who demonstrate that dictators in a modified version of a dictator game are willing to sacrifice low expected gains in favor of being perceived as fair. Thus, it is crucial that participants are made explicitly aware that their choices will remain anonymous in order to avoid results that are skewed upwards. Even if all answers are anonymous however, social image might still be a factor in determining individuals’ choices; perhaps by a desire to not have to lie if a friend asks you what you chose or the risk of seeming greedy to the experimenter should you be selected for payout,⁴ or viewing the minimum as a norm or requirement, creating a pressure to donate (or

⁴Again, see Section 3.1

donate more) because you believe others will do so or will expect you to.

A potential consequence of this focus on anonymity in the experiment design is a reduction in not only the average donation but in the number of donations overall. This is implied in the models by Andreoni and Bernheim (2009), Bénabou and Tirole (2006) and Ellingsen and Johannesson (2008) and is also what Glazer and Konrad (1996) find - people are less likely to donate at all if their contribution is completely anonymous. This could create a situation in the experiment where there are few donations, which coupled with a low fraction of positive donations below the minimum would require large sample sizes to allow behavioral effects to be identified. However, Soule and Madrigal (2015) show that in a pay-what-you-want settings without any social pressure, average payments are greater than zero, suggesting that at least some donations should be observed even in a completely anonymous setting.

Just as was the case for altruism and warm glow, the model and papers discussing social image in this section does not provide an evident prediction as to what would happen as a result of introducing a minimum restriction. The closest a theory comes is perhaps the one proposed by Harbaugh (1998) who show that if there are tiers in donation levels (such as if donating at least \$X, the donor is publicly acknowledged) donors tend to donate the minimum required to get to the desired level - but not more. This is however still dependent upon a certain level of public knowledge of one's donation (with an even transactional quality where donors pay to be acknowledged) which will not be present in the experiment conducted in this paper.

2.3 Loss aversion & Reference prices

As the conclusion of the theories of charitable giving is that no obvious prediction about the impacts of a minimum restriction can be made, the question then becomes what theories might explain a potential change in behavior? Kim et al. (2009) attempts to identify factors that determine why people pay positive amounts in a pay-what-you-want setting and they find that reference prices does impact consumer choices. As such, reference prices appear to be one theory worth examining since it might be relevant in a donation setting as well.

To explain the relevance of references prices however, it is necessary to first introduce the concept of loss aversion. Loss aversion is a part of prospect theory, a theory first introduced by Kahneman and Tversky (1979) as an alternative to the standard expected utility theory. Prospect theory introduces the notion of an individual value function in which losses and gains of the same amount relative to some reference point do not result in equivalent increases or decreases in utility. As an example, Kahneman and Tversky (1979) show that most people would view a 50% chance to gain a certain amount with a 50% risk of losing the same amount as an unattractive bet which becomes less attractive the higher the amount is. For most people to be able to accept a bet such as that, the amount potentially gained instead must be roughly twice the size of the amount potentially lost (Kahneman & Tversky, 1992). The concept of loss aversion extends to reference prices (Mazumdar, Raj, & Sinha, 2005). Every consumer, prior to knowing the price of a good, can be assumed to have an internal reference price - an idea of what they might be willing to pay. The external reference price is then (in most cases) the actual price, or in a setting such as PWYW, it can be either the suggested price, a minimum or a maximum. If the external

reference price then is lower than the internal one, the purchase is viewed as a gain; if you expect to pay \$10 for a good but when you arrive at the store, the cost is actually only \$7, you walk out of the store with the good but also with an unexpected \$3 still in your pocket - a "gain" (Mazumdar et al., 2005). In contrast, if the external reference price is higher than the internal, it is viewed as a loss - if the price of the good is actually \$15 but you were expecting \$10, you will now view it as having to pay an unexpected \$5 extra for the good, thus incurring the feeling of a loss (Mazumdar et al., 2005). This could explain why reference prices are relevant in a pay-what-you-want setting as most consumers are aware what to pay for a record for instance, but it might not translate to a donation setting. The question asked in this experiment is one that perhaps subjects have never encountered and thus they might not have an internal reference *donation*. If they were to have one, and it is lower than the minimum, that could cause subjects who would have otherwise donated below the minimum to experience a loss (in addition to the loss in resources) by increasing their donation following the introduction of a minimum. If the results indicate that the main effect a minimum restriction has is inducing those who would have otherwise donated below the minimum to not donate, then this type of loss aversion might be one potential explanation.

2.4 Anchoring

The anchoring effect as it will be referred to in this paper was first introduced by Kahneman and Tversky (1974). They describe the effect as the disproportionate influence on decision makers to judgements that are biased toward an initially presented value. The initial experiment Kahneman and Tversky used for displaying this effect was asking a group of students to estimate the percentage of African countries in the United Nations in reference to a spinning wheel that randomly selected a number between 0 and 100. The students were asked to consider whether the actual answer was below or above the number of the spinning wheel. Answers in the different groups of students were heavily influenced by the random number - even though it is completely arbitrary - with groups that received lower numbers guessing a lower portion of African countries in the UN and vice versa (Kahneman & Tversky, 1974). Since then, over 40 years of studies have shown anchoring effects to be robust in a wide variety of settings and with different types of participants (Furnham & Boo, 2011).

The psychological motivation for the anchoring effect has been debated over the years. A currently dominating view is that anchoring functions as an activation process where the decision maker, in evaluating their own answer, base their reasoning on the belief that the anchor value is a plausible answer (Furnham & Boo, 2011). For instance, if you want to purchase a bottle of wine and the initial price is \$50, it is reasonable to assume that you will think of the bottle as a fine and pretty expensive wine. Then you have activated aspects of the wine bottle consistent with the anchor value (even if they are actually not true at all), and it will be difficult not to consider those when giving your counteroffer.

In their paper examining reference prices in a pay-what-you-want setting, Johnson and Cui (2013) shows the impact of anchoring effects by introducing external reference prices in the forms of minimums, maximums and suggested prices. They conduct several experiments and some of

the results suggests that the price the participants in the respective treatments were willing to pay differed from the control group not only in the mean, but it also reduced the variance of the paid prices. While their results are not conclusive - one experiment shows a minimum to have significant effect, while another shows no difference - they indicate that in a PWYW setting, all three types of external price references may act as anchors. Since this study is similar to that of Johnson and Cui (2013), it is plausible to assume that anchoring effects will impact donations in this experiment as well. Anchoring could induce those donating above the minimum to donate less as well as potentially causing some who would have otherwise donated below the minimum to increase their donation because of the minimum functioning as an anchor.

2.5 Crowding out

The final theory to cover before moving on to the methodology is crowding out. Crowding out is a phenomenon that is relevant in multiple fields of economics with slightly different interpretations in each. Earlier, when discussing charitable giving and the difference between altruistic and warm glow giving, one example of crowding out was raised. In that case, if people donated using the altruistic model suggested, increasing the donations of others crowded out the individual incentive to donate. Similar reasoning can be used to argue that government spending in a previously privately funded enterprise would crowd out the incentive for those private investments and rather than increasing the amount spent, government spending would not change or could even decrease the total spending (Andreoni, 2006).

In behavioral economics, one of the most famous displays of crowding out was illustrated by Gneezy and Rustichini (2000). The authors show that introducing a fee on parents fetching their children too late from a day-care increased the number of latecomers rather than decreased it. The reasoning behind it being that rather than viewing the fee as punishment to be avoided, the parents treated it as a payment for a service which they then gladly purchased to be able to show up late. The fee crowded out the previously moral incentive for the parents to be on time and simply replaced it with a standard transaction.

The potential implication of the crowding out effect for this study is twofold. First, the model from Andreoni (2006) of altruistic and warm glow giving respectively suggests that if the participants believe that the minimum might raise the donations of all other participants, their incentive to donate decreases. However, given the payout structure of the experiment with all participants being aware that only three of all the choices will actually matter for what is paid out,⁵ this effect seems unlikely. Furthermore, if warm glow rather than altruism is the main driver of donation behavior, the contributions of others do not matter. A second implication of crowding out could be that introducing a minimum might crowd out the incentive for participants to donate above the minimum. If a participant *ex ante* would have donated something above the minimum, they might view the minimum as a suggestion of the appropriate sum to donate and thus choose that amount rather than anything above it. Using the terminology from Gneezy and Rustichini (2000), rather than donating being a moral choice for each individual, a minimum simply becomes the fee of donating, making the situation more transactional than moral. A minimum could also

⁵Again, see Section 3.1

crowd out goodwill - a charity setting a minimum might be perceived as less charitable, causing some to decide not to donate at all (or donate to another charity without a minimum).

3 Methodology and hypotheses

Having discussed the theoretical framework, this section focuses on what these theories imply for the experiment and the potential outcomes. The purpose of this section is to detail the design of the experiment, the potential behavioral effects that might impact participants, the hypotheses to be tested, the statistical methods used to analyze those hypotheses as well as some implications of the potential outcomes and finally some limitations of the design.

3.1 Experimental design

The experiment was conducted via an online survey sent out via e-mail to all students at the Stockholm School of Economics (SSE).⁶ Prior to starting the experiment, participants were presented with a consent form where they had to acknowledge that they understand the purpose of the experiment and how their responses would be used. Participants were also informed that out of all respondents, three would be randomly selected for payout and they were therefore asked to provide their e-mail address in order to enable contacting them should they be selected. The payout was done according to their answers in the survey and as an example, if they were selected and chose to donate half of their endowment to charity, they will receive half of the endowment themselves and the rest will be donated. Finally, participants were informed that all responses are anonymous.⁷ After giving their consent and providing their e-mail, participants were randomly assigned to one of two questions, one representing the control group and the other representing the treatment group.

Control group

Participants who are randomly assigned to the control group play a standard dictator game, taking on the role of the dictator and where the charity functions as the responder. Participants in this group are asked to consider a situation where they have been given 1000 SEK (~\$100) with an option to donate all, nothing or part of that amount to the charity Save the Children Sweden.⁸ The donation options are presented in increments of 100 SEK in order to reduce the risk of misunderstandings and invalid answers, as well as facilitating analysis.

Treatment group

The participants who are assigned to the treatment group play an identical dictator game as the control group with the one addition that their choices of donations are limited. Specifically, they are informed that if they choose to donate, they must donate at least 300 SEK (~\$30). They still retain the option not to donate anything. Apart from that, all instructions are identical to that of the control group and the donation options are still presented in increments of 100 SEK (with the options for donating either 100 or 200 SEK removed).

⁶The survey as well as all information provided to the subjects is found in the appendix.

⁷Unless they are one of the randomly selected individuals who will receive their payoff in which case the procedure of paying out any amount necessitates that the experimenter will become aware of their selection.

⁸Rather than allowing participants to choose their own charity, a specific one was chosen in order to increase the chance that participants would treat the question as a real-world situation as well as to facilitate payouts. The selection of the charity was based on three criteria: it should be charity known both nationally in Sweden and internationally, it should serve a generally acceptable and non-controversial cause and it should not have been the subject of recent scandal - something that proved to disqualify several organizations - in order to avoid situations where participants choose to not donate because they are unwilling to donate to the given charity.

The minimum level of 300 SEK was chosen primarily for three reasons. First, since the options presented to the participants are only given in 100 SEK increments, it had to be set at one of the increments (obviously, something in between could have been chosen but it would not have changed the outcome). Second, in order to enhance potential behavioral effects and thus enable the possibility for drawing meaningful conclusions from the results, the share of participants donating below (or wanting to donate below) the minimum must be sufficiently large. Otherwise, the groups run the risk of being too similar and if behavioral effects exist but are small, they will not be detectable. Finally, the minimum level should be plausible in a real-world setting. If there was a charity interested in setting a minimum, what is it reasonable to expect them to choose? It is difficult to know this for sure but given that the minimum should not scare away a significant portion who want to donate but cannot afford the minimum, it should probably not be too high. To accommodate both this and the second reason, the level of 300 SEK was selected.

While part of this study is influenced by Johnson and Cui (2013), there is one important distinction between the two in the experiment design. In this study, participants retain the option not to donate anything, which is not the case in Johnson and Cui (2013). While this choice likely reduces differences between the control and the treatment group, this does make the setting more realistic. Individuals are rarely, if ever, forced to donate to charity in the real world and thus always keep the option not to donate at all. Thus, even though it might make finding statistically significant differences between the two groups more difficult, allowing participants to choose not to donate in the treatment group should improve potential policy implications of the results, which is seen as a greater benefit to the study as a whole.

The experiment design as a whole is chosen based on several criteria. First of all, in order to conduct relevant statistical analysis, a sufficient sample size is required. The goal of the data collection process as detailed in the pre-registration plan was to get at least 100 respondents in each answer group. This would have been difficult if the design was one that required participants to show up at a certain location to participate in the experiment. This is especially problematic since experiments where participants show up at a certain location often include paying the participants a show-up fee which was not feasible for this experiment given the desired number of respondents. The option used where a few randomly selected subjects are chosen for payout is therefore a convenient tool to induce participants to consider the question as if their choice will come true without having to pay each participant. Charness, Gneezy, and Halladay (2016) conclude that in an experimental setting with multiple decisions, paying participants small amounts for each decision made or randomly selecting one decision that is paid off does not appear to alter participant behavior. Suggesting that even if different payout structures does impact the results, those impacts are small. Finally, the selection of a dictator game with an endowment is preferable to the alternatives in order to elicit the participants' true beliefs. If participants would have been asked to consider a hypothetical scenario, there would have been no stakes and participants would have no incentive to reveal their true preferences. Alternatively, if participants were put in a situation where they donate their own money, endowment effects and loss aversion could be large factors, suppressing donations to the point where statistical analysis would be difficult to conduct. This problem is especially important given that the subject pool is made up of students, an economically weak group who have been found to donate less in dictator

game settings and are less likely to donate to charity compared to the general population (Engel (2011); Edmondson (1986)).

3.1.1 Data collection

The survey was sent out to the university e-mails of all undergraduate students at the Stockholm School of Economics on 2019-11-14 inviting them to participate in the study and informing them about the potential payout. Prior to the actual survey being sent out, a trial run was conducted on 2019-11-08 in which nine participants were asked to test the survey in order to make sure that the survey tool worked, that there were no inaccuracies and that the questions were easy to understand. The trial run participants' answers were not used in the subsequent analysis and they did not partake in the actual survey. The final date to respond to the survey was set to 2019-12-08.

As specified in the pre-registration plan, the target of the data collection procedure was at least 200 total responses to the survey, which would provide (roughly) 100 respondents in the control and treatment group respectively. And while the data itself was not looked at prior to the final date of the survey, the number of respondents was monitored throughout the process in order to ensure that the target number of participants was reached or within reach. Had the desired number of participants not been reached at the closing of the survey, the survey would have been sent out to business students at Uppsala university, giving them the option of responding to the survey for a week in order to ensure that the number of respondents surpassed 200. At survey close, the total number of respondents exceeded 500 and given that Johnson and Cui (2013) find statistically significant results in a similar setting but with much fewer respondents in each treatment group, more than 500 respondents should - given that actual effects are not too small - provide enough experimental power to avoid type 2 errors of failing to reject a true alternative hypothesis.

3.2 Hypotheses and statistical analysis

Using the experimental design described in the previous section, the purpose of this study is to test what impact a minimum restriction has on average donations. In this section, the hypothesis to be tested will be formally stated, along with the statistical methods used, an exploratory analysis that will be conducted will be described and finally some limitations of the design will be discussed. However, when discussing the hypotheses and implications of different outcomes, it is necessary that the potential behavioral effects of introducing a minimum are well understood. As such, the first part of this section will detail potential behavioral effects and their motivations.

3.2.1 Behavioral effects

There are several potential effects on donations of introducing a minimum. These effects work in different directions and are caused by different behavioral mechanisms. After explaining these effects, they will be referenced in part as the motivation for the main hypothesis and they will also function as a shorthand when discussing the implications of the different outcomes following the testing of the hypothesis alongside the exploratory analysis.

Effect 0

Effect 0 represents the behavioral effect most similar to the prediction of standard economic theory following the introduction of a minimum. Assume some individuals gain utility from donating and the willingness to donate and the size of the donation is based upon several unobserved factors which differ for each individual. Assume also that any upward deviation from that chosen amount - due to loss aversion for instance - will result in a loss of individual utility. In this scenario, introducing a minimum would cause all those who would have otherwise donated below the minimum to not donate at all. This is **Effect 0**. An alternative theory for observing this effect would be referring to individuals' ex ante donation amount as their internal price reference where the minimum level is an external price reference. Increasing your donation to the external price reference would then lead to a perceived loss, reducing the likelihood of an upward deviation for loss averse individuals. This would hold even if an individual does gain some utility by increasing their donation but if it is not a large enough gain to outweigh the utility decrease resulting from a loss of resources - in other words, their utility is higher from donating nothing than donating at the minimum. However, if the gain in utility from increasing your donation is larger, we move towards the next effect.

Effect 1

Assume as in the previous case that some individuals gain utility from donating and the willingness to donate and the size of the donation is based upon several unobserved factors which differ for each individual. However, assume that individuals are driven to donate by (for instance) warm glow in which case a donation of nothing does not necessarily give higher utility than increasing the donation above the ex ante desired amount. In that case an individual would have to assess; does increasing my donation above the amount I originally wanted to give increase my utility more than simply keeping it all for myself (the latter representing **Effect 0**). If the former is true and the individual chooses to donate, then the introduction of a minimum restriction caused an individual who would have otherwise donated below the minimum to increase his or her donation. This is **Effect 1**. In this situation, the individual utility of increasing the donation outweighs the utility loss of a decrease in resources. There could be other motivations for **Effect 1** as well. One example would be if an individual's will to donate is absolute, then donating will always provide more utility than not donating. Or perhaps there is an anchoring effect of the minimum restriction, increasing the likelihood of an upward deviation just by functioning as a suggested donation for someone who might have otherwise chosen a lower donation. If an individual views the minimum as a break-even point for the charity and still wants to give a "positive" donation, this could cause individuals donating below the minimum to choose to not only donate at but above the minimum. Thus **Effect 1** is that a minimum restriction might cause some individuals who would have otherwise donated below the minimum to increase their donation to or above the minimum. As implied earlier, this effect works in the opposite direction of **Effect 0**.

Effect 2

Assume as above that individuals do gain some utility from donating but that some individuals experience a lowering of utility by donating exactly the minimum. The reason could either be as above - interpreting the minimum as a break-even and thus to give a true "positive" donation, one must increase the amount above the minimum. Or perhaps due to a perceived social pressure

to donate above the minimum, that it might seem or feel cheap to donate exactly the minimum. This effect would cause individuals who would have otherwise donated the minimum to increase their donation. This is **Effect 2**. **Effect 2** works in the same direction as **Effect 1** but it does not impact the number of total donations.

Effect 3

A minimum could also impact those donating above the minimum in a similar way as in **Effect 2**. If an individual perceive the minimum as a break-even point and still wants the charity to receive the same amount from them as in a situation without a minimum, then that person must increase their donation by the minimum (if you would have donated 400 SEK without a minimum, with a 300 SEK minimum you would give 700 SEK). Perceived societal pressure of increasing a donation as a result of the minimum could also factor in. The resulting effect would be that a minimum restriction increases average donations among those who donate above the minimum. This is **Effect 3**. **Effect 3** is similar to **Effect 2** and in the statistical testing done below, these two will not be distinguishable from each other since they are both behavioral effects that induce those already donating at or above the minimum to donate more.

Effect 4

Assume still that individuals do get some utility from donating and that that utility gain is decided by unobserved factors as described above. Assume also that individuals experience a decrease in utility as a result of a minimum being imposed. This dis-utility could either stem from a willingness to be totally free and not be constrained in any decisions made. Or perhaps a minimum crowds out the feeling of goodwill that individuals ex ante held towards the charity. If this dis-utility is large enough, it could cause those who would otherwise have been donating at or above the minimum to not donate at all. This is **Effect 4**. **Effect 4** works in the same direction as **Effect 0** but instead of affecting those below the minimum, **Effect 4** impacts those donating above it (but the reasoning could still hold for those donating below the minimum as well). **Effect 4** also works in the opposite direction of **Effect 1**.

Effect 5

The fifth and final behavioral effect is similar to the previous one. Suppose individuals still get utility from donating but the introduction of a minimum can have negative influences. These negative influences could be similar to those described above for **Effect 4** like crowding out or constraints on choice. It could also be the result of internal price references that are much higher than the minimum, allowing individuals to reduce their donation with a perceived gain. This could also be caused by anchoring - simply by introducing a minimum, individuals might use this minimum as a starting point when determining their donation, considering it as a valid option and setting their own donations in reference to it. And since the minimum is at the lower end of spectrum of possible donations, that could cause a reduction in the average donations. This would imply that introducing a minimum restriction has negative behavioral effects, inducing those donating above the minimum to reduce their donations. This is **Effect 5**. **Effect 5** works in the same direction as **Effect 4** but does not impact the number of donations. It works in the direct opposite direction of **Effect 2** and **Effect 3** and thus cannot be statistically observed

alongside those.⁹ It also works in the opposite direction of **Effect 1** but it does not impact the number of donations and thus it is possible to find indications of both **Effect 1** and **Effect 5** at the same time. Table 1 briefly summarizes the different effects, their potential behavioral motivations as well as the impact each has on the average donation following the introduction of a minimum.

Table 1: Overview of behavioral effects

Effects	Description	Potential Behavioral Motivations	Impact
Effect 0	Any upward deviation from the ex ante chosen donation amount results in a utility loss	Loss aversion	Reduces donations
Effect 1	Increasing the donation amount above the ex ante chosen sum can provide higher utility than donating nothing	Anchoring, Altruism & Warm glow	Increases donations
Effect 2	Donating exactly the minimum reduces utility	Social image	Increases donations
Effect 3	Introducing a minimum increases donations among those who donate above the minimum	Social image	Increases donations
Effect 4	Introducing a minimum results in those who would have otherwise donated not donating at all	Crowding out	Reduces donations
Effect 5	Introducing a minimum results in those donating lowering their donations	Anchoring & Crowding out	Reduces donations

With these potential effects of introducing a minimum restriction detailed, it is possible to proceed to stating the main hypothesis.

3.2.2 Hypothesis 1

As is shown in the different effects above, there is reasons to believe that the introduction of a minimum restriction in a donation setting will impact the decision of the donors. To investigate the size of these effects is the goal stated in the research question and it is also captured in the main hypothesis.

Hypothesis 1

The average donation will differ between the treatment group and the control group.

In order to test *Hypothesis 1*, a non-parametric Mann-Whitney U test will be used to compare the mean between the control and the treatment group. The selection of a non-parametric test over a standard t-test is due to the ex ante belief that the answers are unlikely to follow a normal distribution.¹⁰ The null hypothesis is that there is no difference in the average donation between

⁹It is entirely possible that all effects are present in the sample, but should **Effect 5** be much larger than **Effect 2** and **3**, it will not be possible to statistically identify the latter two even though they might exist and influence decisions of some participants.

¹⁰In general, the distributions of answers from charity games have three peaks (rather than one); at zero, at the

the groups and it will be treated as rejected if a p-value less than 0.05 is observed. Since there are potential behavioral effects working both to increase and decrease donations, no prediction of direction in which donations will differ is included in the hypothesis.

If average donations are found to be significantly higher in the treatment group compared to the control group, that would be an indication that **Effects 1, 2 and 3** in some combination are comparatively large. If average donations are significantly lower in the treatment group compared to the control group, that would indicate that **Effects 0, 4 and 5** either by themselves or together are large. Thus, even if H_0^1 - the null hypothesis - is rejected in one way or the other, it would still not be possible to say with certainty which behavioral effects was the cause. In order to do so, the results have to be examined more carefully, which is done in the exploratory analysis detailed the next section.

A final note on the testing of *H1* is that regardless of the behavioral implications, the results produced will have relevant policy implications. If the null hypothesis is rejected and average donations are lower in the treatment group, that would indicate that on average the introduction of a minimum is not a desirable strategy for increasing giving to a charitable organization. If *H1* is accepted but average donations are higher in the treatment group, introducing a minimum would be desirable strategy.

3.2.3 Exploratory analysis

To better understand the results of testing *Hypothesis 1*, additional statistical analysis is necessary. Thus - as was specified in the pre-registration - regardless of the outcome of testing *H1*, an additional set of tests will be conducted in which the fraction of donations at each donation level is compared between the control and the treatment group. This testing includes comparing the number of those electing not to donate at all but obviously not those donating below the minimum in the control group since those are not options in the treatment group. This analysis will be performed using a Chi-squared test comparing the fraction of donations for each possible donation level. The null hypothesis in all cases will be one of no difference in each category between the control and treatment groups and the null will be treated as rejected if a p-value less than 0.05 is observed.

Hypothesis 2 - Hypothesis 10

The fraction of donations of 0/300/400/500/600/700/800/900/1000 will differ between the treatment group and the control group.

Out of these nine exploratory hypotheses, *Hypothesis 2* is of particular interest because the outcome of testing this hypothesis will by itself give insights into which behavioral effects might be prominent. To exemplify, notice that the *H2* actually tests how many individuals choose to donate in the treatment group and control group respectively. That means that the result of testing *H2* will be revealing in some way since it directly depends on three of the stated behavioral effects; **0, 1 and 4**. If the null hypothesis, H_0^2 , is accepted, indicating no difference fifty-fifty split and at the maximum (Carpenter, Connolly, and Myers (2008); Eckel and Grossman (1996)).

in the number of donations between control and treatment group, **Effect 1** must be large. If the null is rejected and the number of donations is higher in the treatment group compared to the control group, **Effect 1** must be even larger. If the null is rejected but where the number of donations are lower in the treatment group, either **Effect 0, 4** or both must be large. In this situation, it is possible to use the results from testing *Hypothesis 3-10* to further investigate which of the effects appear to be larger. If, for instance, the fraction of donations at most or every level is significantly lower for the treatment group, many of those who would have otherwise donated above the minimum must have chosen not to donate at all, providing evidence of **Effect 4**. If on the other hand the fraction of donations are equal at all levels between the groups, **Effect 0** would appear to be the dominating effect.

Additionally, the outcome of *H2* is interesting also because alongside the results from *H1*, even more inference about potential effects can be made. Building upon the final example from the last paragraph in which the number of donations are lower in the treatment group, if testing *H1* shows that average donations are larger or the same in the treatment group as in the control group, **Effect 2, Effect 3** or both must be large. This because a lower number of donations should - all else equal - mean lower average donations, and if this is not the case, there must be some positive effects on those donating above the minimum.

If testing *H1* shows that the average donation in the treatment group is smaller than in the control group while testing *H2* indicates fewer donations in the treatment group, that could be either due to **Effect 0, 4** or **5** in some combination. Again, by looking at the results from testing *H3-H10*, it could be possible to differentiate between the three. A similar reasoning for when **Effect 0** or **Effect 4** are large as given before would still hold, but if the fraction of donations is higher at the lower levels in the treatment group but lower at the higher levels - indicating a downwards shift by those who donate above the minimum - there would be some evidence of **Effect 5**. It will still not be possible to say with certainty which of the effects is the most prevalent because even in the extreme examples given, the possibility of the effects working together remains. However, the usage of the results from *H3-H10* still provide more insight compared to only observing the outcomes of *H1* and *H2*.

If testing *H2* shows that the number of donations in the treatment group is larger or not significantly different from the control group, **Effect 1** must be large. In that case, even though a minimum has been introduced, there is no reduction in the number of donations, indicating that those who would have otherwise donated below the minimum are choosing to donate at or above the minimum. In this situation, the prediction would be that testing *H1* should indicate that the average donation in the treatment group is larger than that of the control group. If that is the case, it would appear that **Effect 1** is the dominating effect (**Effects 2** and **3** could also factor in). However, if the average donation is the same or smaller in the control group, alongside **Effect 1**, there must be a negative effect pushing down donations among those who donate, indicating that **Effect 5** is large. One important note here however is that if the result where both the number of donations as well as the average donation are found to be the same in both control and treatment group (H_1^1 and H_1^2 are both rejected), some caution must be taken in the interpretation. This is because this result would also be the one observed if the number

of people donating below the minimum is small, making both the treatment and control group likely to be very similar and in which case extrapolating any behavioral insights from this testing would be difficult.¹¹

The combined results of testing *H1* and *H2* and the implied effects discussed above are summarized in Table 2 below.

		The average donation (H1) in treatment group is		
		Larger	Equal	Smaller
The number of donations (H2) in treatment group are	Larger	1	1 & 5	1 & 5
	Equal	1	1 & 5	1 & 5
	Smaller	0, 2 & 3	0, 2 & 3	0, 4 or 5

Table 2: Outcomes and potential effects

While the combined outcomes of *H1* and *H2* provide some insight into which behavioral effects are or are not present, for certain situations in particular further analysis of *H3-H10* would be of interest to better understand the results. One such situation was already described in which it would be possible to differentiate between **Effects 0, 4 and 5**. Additionally, the analysis of *H3-H10* can also be used to confirm the results extrapolated from the outcome of the first two hypotheses. If for instance average donations are smaller (*H1* is accepted) while the number of donations are equal (*H2* is rejected), the exploratory analysis should reveal significantly lower fractions of donations for the treatment group at some or all of the higher levels while the fraction choosing to donate at the lower levels should be higher in the treatment group. If this the case but, for instance, only the fraction of those donating the minimum level is higher, then the primary result of **Effect 1** would be to induce those who would have otherwise donated below the minimum to donate exactly the minimum rather than more.

There are more potential outcomes in which analyzing the results of this exploratory analysis would provide additional insights but for the sake of brevity all those will not be detailed here. An important note however is that regardless of other outcomes, the exploratory analysis is of interest itself. For instance, seeing if a minimum restriction reduces the willingness to donate the maximum would be interesting no matter the outcomes of any of the other tests.

3.3 Limitations

As with all research designs, there are limitations to the one used in this paper. First of all, the subject pool is (most likely going to be) exclusively students. While the finding of dictator game giving has been shown to be robust across different demographics, Engel (2011) points out that students on average give less than non-students. Even in situations where subjects play the charity version of the dictator game introduced by Eckel and Grossman (1996) discussed in Section 2.1, Carpenter et al. (2008) find that students on average are much less likely to donate the maximum amount compared to other community members - indicating that they as a group

¹¹As described above, this is one of the reasons for the selected minimum in the experiment, since by increasing the group that would otherwise be likely to donate below the minimum, the risk of a null result due to this effect is reduced.

are not representative of the population as a whole. As for why this is the case, Carpenter et al. (2008), find that age is a robust determinant of donations - the older you are, the more you donate - and given that students tend to be young, that is likely one driving factor. An additional hypothesis would be that students in general are an economically weak group and thus value the endowment more compared to other groups, resulting in them being less willing to donate. Carpenter et al. (2008) provide results that show indications of this effect, but their evidence is not conclusive. While this does not impact the statistical analysis itself due to the randomization of participants, it could increase the number of participants who choose to donate low amounts or choose not to donate at all to the point where the data used for analysis is too sparse to provide useful results. Even if this is not the case, when interpreting the results, some care must be taken given that the group studied might not be representative of the entire population, in other words limiting the external validity.

Motivated by the issue of potential low donations by students, the framework of a dictator game with an endowment is used. While this might provide more data points since individuals are probably more likely to give away money they just "got" rather than their own, this does present a limitation in interpretation. Namely, while in this situation individuals hopefully act as they would have in a similar real-world instance where they are presented with an option to give to charity, that is not necessarily the case. This is not a completely realistic scenario and depending on the outcome of the testing, careful consideration must be taken regarding if the results found are due to the experiment design or if they are likely to translate to real-world situations. A related limitation that was mentioned earlier is the choice of the minimum. A charity might be more inclined to set a low minimum equivalent to a dollar or two in order to cover transaction costs, and thus the minimum level selected in this paper might seem way too large. It is set at such a high level however in order to elicit a significant difference between the two groups, even though it might make policy implications less obvious.

Furthermore, the design relies on the payout structure to give participants incentive to treat the experiment question as a true proposition that might occur to them. While this structure has been used successfully in the past, there is no guarantee that it will have the desired effect and thus participants might choose answers that do not reflect their true beliefs. However, as long as this is not systemic to a large extent, the randomization of participants should deal with the few individuals who might act in this way equally and the analysis can proceed unimpaired. Additionally, even though the survey has been constructed with the explicit purpose of being easy to follow, it is possible that subjects will miss-interpret the questions. The design does not have a fail-safe for these instances, unlike when an experiment is conducted on location where the subjects can ask questions to the experimenter. But as long as potential miss-understandings are equally distributed throughout the control and treatment group, the design should still provide data which can be analysed without issue.

An additional limitation to the design is the lack of within-group analysis. Seeing as there are multiple potential impacts of the minimum restrictions which some work in opposite directions, it would be of value to closer examine which individual is affected by which impact - if someone decides to donate the minimum because the minimum entices them to lower their donation or

if they would have donated below the minimum and instead chose to increase their donation. However, in order to perform within-group examinations, all subjects would have to be asked both questions. In doing so, it is unavoidable that the decision regarding the question that comes second will be heavily correlated to the answer the subject gave on the first question. This would be expected since an altruistic individual is likely to answer in a different way compared to a more selfish individual. However, the issue is that the answer to the second question is likely influenced also by the fact that the first question was answered - regardless of which question comes first. Therefore, even by randomizing the order, the within-subject analysis would not provide an accurate measure of each individual's true preferences when answering the second question, rendering that question less useful for analysis. And if only the first question can be used, the result would be that the statistical analysis produces the same answers as the current study design provides. Thus, in order to provide within-group analysis, a much different experimental approach would have to be used.

Lastly, one limitation of the approach chosen in this paper is the lack of ability to differentiate between certain behavioral effects. For effects that work in the same direction such as **Effect 4** and **Effect 5**, and **Effect 2** and **Effect 3** respectively, there is sometimes no analysis which differentiates between the two. However, since the effects share at least some of the same underlying behavioral implications and since, given certain outcomes, there are sometimes possibilities to show differences, this is not seen as a flaw serious enough to demand a change in the methodology.

4 Results

In this section, the results of the experiment will be presented, starting with some summary statistics and a graphical representation of the data, followed by the results of the main hypothesis testing and ending with a discussion on the exploratory analysis.

4.1 Summary statistics

The data used for the statistical analysis consists of 534 completed survey submissions. At survey close there were 643 responses recorded but of those, 106 were incomplete or partial responses where the main question of interest had not been answered. These 106 responses were discarded from further analysis. There were no recorded instances of multiple completions of the survey related to a single e-mail. However, three individuals appear to have started the survey, filled out their e-mail, and then closed the survey without finishing it, only to do it again later. In addition to discarding their partial responses, their completed answers were also removed from the data.¹² This leaves the 534 completed submissions for which Table 3 displays some notable summary statistics.

Table 3: Summary statistics

	Group size	Number of donations (%)	Average donation
Control	264	201 (76.1%)	356.82
Treatment	270	202 (74.8%)	383.70

Notes: Means calculated including the respondents who chose not to give anything, in line with other charity games and subsequent testing.

Using only this basic overview of the data it is worth noting first of all that the number of donations is almost identical between the two groups - both in terms of percentages and absolute values - a fact that will be expanded upon further when discussing the results of the exploratory analysis. Furthermore, the average donation is larger in the treatment group compared to the control group. However, it is not clear whether this difference is statistically significant, which will be tested when discussing *Hypothesis 1*. The average donation is slightly higher than in standard dictator games where the subjects on average give 28.4% of the endowment (Engel, 2011). Comparing the average to the average donations in other papers using the charity game setting, the mean donation is in line with the findings of Eckel and Grossman (1996) (30.1% of the endowment) but significantly lower than those found in Carpenter et al. (2008) (72.3% of the endowment for non-students and 54.7% for students).

¹²This was done since they could each have seen the question of interest before not responding, and then, when doing the survey a second time, be asked the other of the two questions. Their response would then be biased and as such, these responses were not included. This is an addition to the data exclusion criteria specified in the pre-registration plan since this type of issue was not foreseen when writing the pre-registration. For robustness, all relevant statistical testing was done (but not included in the paper) using a dataset with the three additional responses added. This did not alter the results nor their interpretation.

Figure 1: Distribution of donations

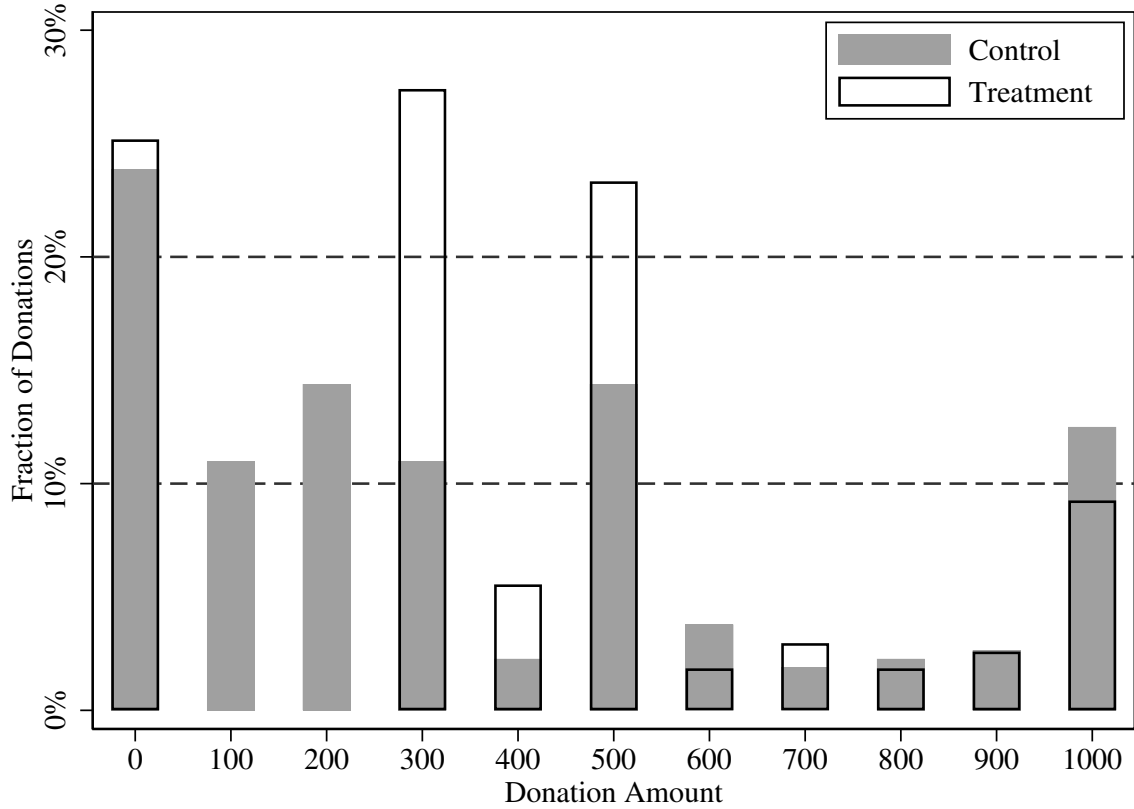


Figure 1 visualizes the fraction of donations at the different levels which allows for some further analysis. In addition to the fraction of those not donating at all being almost equal in the treatment and control groups, the distribution of donations at the upper levels appear to be similar as well. The only large differences that are observed are for the levels at or just above the minimum, suggesting that those who would have otherwise donated below the minimum chose to increase their donations slightly as a result of the introduction of a minimum - something that will be tested when discussing the exploratory analysis. It is also clear that the answers are not distributed according to a normal distribution. This was the *ex ante* belief and the reason why a method of statistical testing that does not rely upon an underlying normal distribution was selected.

The distribution of donations are somewhat similar to those of other charity games, specifically that of Eckel and Grossman (1996) whom find several peaks at the lower levels of donations, a peak at the equal split, almost no donations at all above the equal split expect for another peak at the option to donate all. However, Carpenter et al. (2008), who uses an experimental approach similar to the one used in this paper with respect to their student respondents,¹³ finds that a much smaller fraction chooses to donate nothing. Compared to Carpenter et al. (2008), this paper also finds much larger fractions of donations at the lower levels which in the treatment

¹³To elicit responses from students, the authors use an online survey. They also collect responses from other community members but that is done via sending out mails where the respondents could choose either to resend the mail or answer online. The payout structure is also similar to that of this study, with 10% of respondents being randomly selected to receive their payout.

group could be due to the introduction of a minimum, but that explanation cannot be applied to the control group.

4.2 Experiment results

Hypothesis 1 is tested in Table 4 where the purpose is to determine whether the previously observed difference in means between the two groups is statistically significant.

Table 4: Hypothesis 1 - Results

	Average donation
Control	356.82
Treatment	383.70
Mann-Whitney U	0.103

Notes: The final line displays the p-values after performing a Mann Whitney U test with a null of no difference between the groups and where a p-value less than 0.05 indicate rejection of the null and a statistically significant difference between the two groups.

The average donation was 7.5% higher in the treatment group compared to the control group. However, the p-value of 0.103 shown in Table 4 means that the null of no difference cannot be rejected at the 5% significance level. Thus, it is not possible to say that the average donation was different in the control and the treatment group respectively. Had a p-value below 0.05 been observed given the averages shown in Table 4, the result would indicate that donations were on average higher in the treatment group compared to the control group. However, as this was not the case, the only thing that can be said conclusively about these results is that there is no statistical difference between the average donations with and without a minimum restriction.

As mentioned when discussing *Hypothesis 1* in Section 3.2.2, a failure to reject the null of no difference suggest that **Effect 1, 2 and 3**, in some combination, are large in comparison to the other behavioral effects. In other words, the introduction of a minimum either pushes individuals who would have donated below the minimum to raise their donations (**Effect 1**), or induces those donating at or above the minimum to increase their donations (**Effects 2 and 3**), or both. To be able to possibly distinguish between these effects, the results from the exploratory analysis are required.

4.2.1 Exploratory analysis

In this section the results from the exploratory analysis (testing *Hypothesis 2-Hypothesis 10*) will be presented and discussed. The results are shown in Table 5.

Table 5: Exploratory Analysis - Results

	Donation level											Total
	0	100	200	300	400	500	600	700	800	900	1000	
Control	63	29	38	29	6	38	10	5	6	7	33	264
Treatment	68	0	0	74	15	63	5	8	5	7	25	270
Total	131	29	38	103	21	101	15	13	11	14	58	534
χ^2 -test	0.72	-	-	0.00	0.05	0.01	0.18	0.42	0.73	0.97	0.23	

Notes: The final line displays p-values for each donation level following a Chi-square test where a p-value less than 0.05 indicate a statistically significant difference between the two groups.

Looking at Table 5, the null of no difference can be rejected at the 300- and 500-level, indicating that the fraction of donations were statistically significantly higher at these two levels in the treatment group compared to the control group. The most significant difference is observed at the minimum level which would have been rejected at the 0.01-level as well. It is notable that the number of donations at the 400-level is larger in the treatment group and that the number of donations at the maximum is higher in the control group compared to the treatment group, but neither of these differences reach the level of statistical significance.

Hypothesis 2 tests whether the number of donations are significantly different between the control and treatment groups. Since the null is not rejected, the conclusion is that the introduction of a minimum does not significantly impact the donation decision of individuals - those who want to donate, donate regardless and those who do not, do not. In other words, the standard economic prediction captured when describing **Effect 0** in Section 3 is not applicable in this scenario since there is no evidence that those who would have otherwise donated below the minimum simply choose not to donate at all following the introduction of a minimum. Similarly, there is no evidence of **Effect 4**, which stipulates that individuals who would have otherwise donated at or above the minimum would choose not to donate at all as a result of the introduction of a minimum, given the fact that donations in the different group are not significantly different.

Effect 3 stipulates that individuals who were donating above the minimum would raise their donations as a result of the introduction of a minimum. There is no evidence of that occurring in the data since the results from Table 5 shows that first of all, the distribution of donations at all the upper levels (>500) are more or less unaffected by the introduction of a minimum. And second, the number of donations of 300, 400 and 500 all increase in the treatment group. If **Effect 3** was comparatively large, the expectation would be to observe decreases in the number of donations at these lower levels and increases at the upper ones.

Effect 2 states that individuals who would have donated exactly the minimum choose to increase their donation as a result of the minimum being introduced. The statistically significant increase at the 500-level is suggestive that this might be the case. However, if **Effect 2** was large, there should be a corresponding decrease in the number of donations at the minimum level - a statement that is not supported by the results. Therefore, while both **Effects 2** and **3** might still be relevant to some degree in determining the choices of the participants, they are far too small to be distinguishable in this experiment.

Following the above reasoning, what appears to be driving the observed results in this experiment is **Effect 1**, that individuals who would have otherwise donated below the minimum choose to increase their donation to or above the minimum amount. The failure to reject the null when testing *Hypothesis 2*, indicating that the number of donations does not significantly differ between the two groups, along with the above mentioned lack of evidence supporting **Effects 2** and **3**, leaves this as the only possibility. The introduction of a minimum appears to induce individuals who would have otherwise donated below the minimum to increase their donation to the minimum and perhaps even slightly above the minimum.¹⁴

Effect 5 stipulates that the introduction of a minimum would cause those donating above the minimum to reduce their donation. In Table 2, it was suggested that if the result found was the observed one, where H_1^1 and H_1^2 are both rejected, that would be evidence of both **Effect 1** and **Effect 5**. There are suggestions in the data that **Effect 5** might be relevant. The total number of donations at the upper levels (>500) is lower in the treatment group compared to the control group and the number of donations at all the lower levels are higher. However, while the latter is based on mostly statistically significant results, the former is not. It is possible that given a larger sample size, statistically significant differences emerges at the upper levels consistent with **Effect 5** and thus, while it is not possible to show the effects in these results, one cannot rule out the impact of **Effect 5** with certainty. Additionally, since the results from testing *Hypothesis 1* did not indicate any difference between the average donation in the treatment and control group, even if **Effect 5** exists, it is not large enough compared to **Effect 1** to push average donations in the treatment group down below the control group.

Lastly, one issue that was brought up in Section 3.2.3 was that if this result was observed, where H_1^1 and H_1^2 are both rejected, some caution must be taken since it is the same result as would be observed if the number of people donating below the minimum was low. The implication being that if few participants chose to donate below the minimum in the control group, the introduction of a minimum would alter the behavior of too few subjects to show significant effects - even if effects existed. However, this is not an issue since 25% of all control group participants chose to donate a positive amount below the minimum.

¹⁴Suggestive evidence of this result is the fact that in the control group, the number of donations of 100 and 200 together equals 67, and the increase of the number of donations in the treatment group at the two levels where a statistically significant increase was detected (300 and 500) equals 70 which suggests an almost one-to-one shift of all whom would have otherwise donate below the minimum to donate at or slightly above it.

5 Discussion

In this study, a charity version of the standard dictator game is conducted in which each experiment participant plays the role of the dictator and decides on how to split the endowment between him- or herself and a given charity. Participants are divided into two groups, one which plays the game as described above, and one which is subject to a minimum restriction where if the participant wants to donate, he or she cannot donate below a given threshold. Statistical analysis of the results from this experiment indicate that there is no statistically significant difference in the average donation of participants in the two groups. In addition, there is no statistically significant difference in the number of participants who choose to donate between the two groups. However, there is statistically significant increases in donations at the minimum and at the equal split in the treatment group compared to the control group. There are several different possible explanations for these results. One impact introducing the minimum appears to have is inducing participants who would have otherwise chosen to donate below the minimum to increase their donation to or slightly above the minimum. However, if this was the sole effect, the expectation would be to observe a statistically significant increase in the average donation overall as well. Since this is not the case, there is likely additional effects or reasons why this is not observed. In this section, these effects and their implications will be discussed, both in terms of which behavioral effects might be important factors and in terms of what potential implications for policy-making - especially for charities - these results have.

5.1 Behavioral implications

As stated above, regardless of other factors, one effect of introducing a minimum appears to be that individuals who would have otherwise donated below the minimum chose to increase their donations slightly. This result is consistent with several different theories of charitable giving and transaction behavior discussed in Section 2. First of all, this result is in line with the notion that donating something rather than nothing provides increased utility, even if the donation is potentially higher than what an individual would have chosen if not subject to a restriction. If increasing one's donation above what one would have otherwise donated incurs a perceived loss, these results indicate that the increase in utility gained from donating a larger amount outweighs that perceived loss, implying low or non-existent loss aversion. This is however consistent with the idea of purely altruistic giving as a motivation for donations since increasing one's donation should increase perceived utility gained by the recipients which could outweigh the reduction of utility resulting from an increased loss of resources following a larger donation. However, the results overall suggest that perhaps pure altruism is not the sole motivating factor for donations. For instance, Eckel and Grossman (1996) argues that altruism as a motivation should increase the willingness to donate yet in the control group, 24% of the participants chose to donate nothing. If all participants are pure altruists, that would mean that a quarter of them views the utility oneself gains from an additional 100 SEK as larger than the utility that would bring to the recipients. While certainly possible to explain using pure altruism, that result indicates that the behavior of at least some of the participants is not solely motivated by pure altruism and that there are other motivating factors impacting decisions in this experiment as well.

While it is difficult to exclude pure altruism as a motivation for the observed results, the

evidence for donors being motivated by warm glow appears much clearer. In addition to the perceived increased utility of the recipients following an increased donation, a warm glow giver also receives additional utility from donating at all. Warm glow theories of giving are consistent with individuals donating positive but small since the act of donating in itself provides utility. Thus, this theory serves both to explain the observed results in the control group as well as in the treatment group where - in both cases - donations are concentrated at the bottom-end of the possible choices.

The main findings of this study could potentially also be in line with social image ideas of donations as well. If individuals fear to potentially seem greedy to their peers for instance, they would likely choose to increase their donations to the minimum rather than donate nothing following the introduction of a minimum. However, the results overall are not entirely consistent with this idea being a main cause of the results since both the average donation and the number of donations in total are lower than other comparable charity games (specifically Carpenter et al. (2008)). Participants therefore appear to be more than fine with running the risk of appearing greedy to their peers following a low or non-existent donation regardless of whether they are in the control or treatment group. Thus, as with pure altruism, it is not possible to exclude social image as a motivating factor for donations in the experiment, but there is not much evidence to confirm that it is the only influencing behavioral effect.

Johnson and Cui (2013) finds that anchoring effects are the main driver of the differences in decisions following the introduction of a minimum in a pay-what-you-want setting. The results from this study do not display the same anchoring effects as was shown by Johnson and Cui (2013) where there was a statistically significant decrease in the chosen price following the introduction of a minimum. However, this does not mean that anchoring as a motivating force behind participants' decisions was not relevant. To the contrary, the results found are in line with predictions of anchoring effects. There is a sharp increase at the minimum level in the treatment group - a finding which is consistent with anchoring as individuals in the treatment group would in that case treat the minimum as an anchor and evaluate all other possible donations in relation to that anchor, which in turn would increase the likelihood of them selecting the anchor value as their donation of choice.

Furthermore, anchoring might provide an explanation for why there might be an increase in donations not only at the minimum, but also above it. If the anchor value functions as a break-even point for the charity in the minds of the participants, and they would still like to contribute a "positive" amount above this value, then subjects would choose to donate slightly above the anchor value as a result of the minimum introduction. Specifically, consider those donating 200 in the control group. If they perceive the minimum of 300 as a break-even point for the charity and still want to donate the same positive amount as without the minimum, their donation would be 500. While it is difficult to find conclusive evidence of this effect, in the control group there are 38 participants donating 200, and in the treatment group the number of donations of 500 are 30 more than in the control group, which is at least suggestive of such a relationship.

An important note is also that while Johnson and Cui (2013) found statistically significant decreases in chosen prices among subjects following the introduction of a minimum in a pay-what-you-want setting, this study does not find similar such effects even though the sample size is increased. However, this difference might be attributable to the difference in experiment design discussed earlier, where subjects in the minimum treatment in Johnson and Cui (2013) could not choose to not pay anything. This should naturally aggregate at the minimum not only those who would have otherwise paid below the minimum but also those who would otherwise not have paid at all.¹⁵ The differing findings of this paper compared to Johnson and Cui (2013) are thus most likely due to differences in experiment design. However, it could also be a slight indication that there are perhaps different behavioral mechanisms that determine the choices of individuals in a pay-what-you-want setting and a donation setting which - if true - would be an important, previously unobserved, finding. Based on the differing experimental designs however, no such conclusion can be drawn based merely on this study and it should instead be subject to further research.

While the above discussion has mainly focused on the reasons why an increase is observed at the minimum and equal split in the treatment group, anchoring might provide an explanation as to why the overall mean is not statistically significantly higher in the treatment group. As stated previously, if the only effect the introduction of a minimum had on participants was inducing those donating below the minimum to increase their donation to or slightly above the minimum, an overall increase in the mean is expected. One reason why this might not be the case is due to the anchoring effect dragging donations downwards. For individuals who would have otherwise donated above the minimum, the minimum might function as an anchor which makes them more likely to reduce their donations towards the anchor. If this effect was large, a significant reduction in donations at the higher levels would be expected but this is not the case. However, the overall average being equal in the two groups suggest that this effect might exist but be small. Alternative explanations include that this type of anchoring is actually not a relevant effect but that more power and a larger sample size is necessary to show the effects of the upwards shift in those donating below the minimum on the entire sample.

Lastly, a minimum does not appear to crowd out goodwill - that both the numbers of donations and the levels of donation would decrease as a result of the minimum - and thus no evidence that subjects view the charity as 'less charitable' than without a minimum. However, this result might be due to the fact that it is not the charity itself that imposes the minimum but the experimenter. Thus, in a situation where the minimum is not imposed by a third party such as in this case, results might vary and should be subject to further research.

In conclusion, the results of this study are primarily consistent with behavior determined by theories of warm glow giving and of anchoring effects motivating the observed increase in donations at the minimum and the equal split in the treatment group. Pure altruism and social image could also be important effects but neither appear to be the sole motivating factor. The

¹⁵ Additionally, as was mentioned in Section 2.4, it is worth noting that while their first study shows a significant decrease in chosen price following the minimum, in a secondary study comparing a control group to a group with a minimum restriction, Johnson and Cui (2013) are not able to replicate this result when comparing the average prices chosen.

fact that the overall mean is not statistically significantly different between the two groups could be explained by negative behavioral effects caused by anchoring or alternatively by a lack of power in showing the positive effects the minimum has on the overall sample.

5.2 Policy implications

While the policy implications in certain regards are much more obvious compared to the behavioral implications, the research design does offer some limitations with respect to interpretations. Merely based on the results, there is in this study no evidence that introducing a minimum has a significant negative effect neither on donations nor the number of people choosing to donate. However, due to the limitations of the study, this finding is unlikely to translate exactly to a real-world situation. First of all, as mentioned in the previous section, the response to a minimum might differ when it is instituted by the charity itself compared to an experimenter. Second, the experiment design also poses potential issues; since subjects are provided an endowment and because there is only a small chance that their choice is actually realized, subjects might react differently to a minimum in a real-world situation. And thus, while these results are encouraging for a charity considering whether to implement a minimum restriction on donations, it is possible that the preliminary evidence found in this study is mainly motivated by the experiment design and will thus not hold in a real-world setting.

There are also some limitations to the study that could theoretically imply that donors would actually increase donations in a real-world setting compared to this experiment. The first is the fact that the subject pool consists of students, who tend to donate less compared to the average population (Carpenter et al., 2008). Second, as has been discussed earlier, the chosen minimum is likely high compared to what an actual charity might set. Reducing the minimum potentially reduces the (small or non-existent in this experimental setting) risk that individuals choose not to donate at all following a minimum restriction. Thus, while other drawbacks to this research design might reduce donations in a real-world setting, these limitations would instead increase donations. However, it is difficult to assess how these limitations - both causing potential upwards and downwards shifts - would interact and thus while they might off-set each other, it is equally as possible that the size of their impacts is vastly different.

6 Concluding remarks

This study utilizes the framework of a standard dictator game with all participants taking the role of the dictator while the counterpart is replaced with a given charity in order to explore donation behavior in response to the introduction of a minimum restriction. The results from the experiment indicates that there is no statistically significant impact of introducing a minimum on the number of donors nor the average amount donated. However, the results do show statistically significant increases in the number of donations in the treatment group at the minimum amount as well as at the equal split where the participant give half of their endowment and keep half. These results put together suggests that one effect on donor behavior the introduction a minimum has is inducing those who would have otherwise donated below the minimum to increase their donations to or above the minimum. But there also appears to be some other factor explaining why the minimum does not cause a significant difference in the overall means between the two groups.

The results are consistent both with warm glow theories of charitable giving, in which subjects gain utility from giving anything more than they lose utility of donating above what they would have otherwise selected, as well as theories of anchoring, where the introduced minimum functions as an anchor value which causes participants to become more likely to choose it or a nearby value for their donation. However, it is not possible to discard other theories such as pure altruism and social image being motivating factors, but evidence for these effects are not as clear in the results. The fact that the overall mean is not statistically different between the groups could also be explained by anchoring but also by a lack of power to detect small effects. The implications for charities in particular is that while the study does have certain limitations which might cause behavior to change in a real-world situation, the results provide preliminary evidence that charities could implement minimum restrictions without neither the number of donations nor the average amount donated being impacted significantly.

Following the experiment and the results presented in this paper, there are several different avenues of further research that could be explored. For instance, additional research should be conducted investigating whether there are differences in behavioral mechanisms determining choices between donation and pay-what-you-want settings. The comparisons between this study and that of Johnson and Cui (2013) are potentially suggestive of such a difference but the comparison is flawed due in part to the differences in experiment design. Further replications of similar dictator games as in this study should therefore be conducted in which the setting of charity or pay-what-you-want is varied between subject groups. Finally, as this study is the first to introduce a minimum restriction in a charity setting, the observed results could be due to the design of the experiment or the subject group for instance. As such, additional studies using similar experiment designs but altering the specifics of the experiment should be done in order to further investigate which behavioral effects might be determining individual choice. As an example, one change that could be made would be to alter the minimum. A higher minimum would cause the group of people donating below the minimum to increase, making certain behavioral effects more prominent. Alternatively, lowering the minimum would perhaps create a more realistic setting since charities might be unwilling to set a minimum as high as the

one in this study. Additionally, increasing the sample size or replacing the online survey with classroom participants would also be of interest to see if results change. The most interesting avenue of further research would however be to examine these effects in a field experiment with a real charity and actual donors.

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Appendix

Experiment instructions

E-mail

E-mail sent out to all undergraduate students at the Stockholm School of Economics.

Subject line: SSE Survey Experiment

Hi,

I am conducting an experiment as part of my master's thesis here at SSE and I am in need of participants. All you have to do in order to participate is answer a short survey with only **one main question**. The estimated time to complete the survey is **2 minutes** and by participating you have a chance to **make up to 1000 SEK**.

Your participation is anonymous to other participants.

The survey can be accessed either on a computer or on a phone by following the link below:

https://hhs.qualtrics.com/jfe/form/SV_8pRRq4DTRPQXJT7

Your participation is greatly appreciated!

Best regards,
Simon Billinger

41460@student.hhs.se

Survey

PAGE 1

Welcome to a short experiment about decision-making!

This survey is conducted as part of a master's thesis at the Stockholm School of Economics. The time required to complete the survey estimated to be 2 minutes.

Participation is anonymous. Please do not discuss the experiment with others after you have completed the survey.

Thanks for you participation!

PAGE 2

Online Survey Consent Form

You have been invited to participate in a short survey with the purpose of examining decision-making. The survey contains one (1) main question and the time required to answer is 2 minutes. Your participation is voluntary and you can choose to end the survey at any time.

Risks: There are no risks associated with participation.

Benefits: Three (3) participants will be randomly selected to receive compensation in accordance with their choices made in the survey.

Anonymity: Your participation as well as your choices are anonymous to other participants and to the experimenter. Individual choices will not be looked at. The only exception is if you are selected for compensation in which case payout necessitates that your choices become known to the experimenter.

Contact: This study is conducted by Simon Billinger from the Stockholm School of Economics. If you have any questions about the survey or anything concerning it, please contact me at 41460@student.hhs.se.

By selecting "I agree" below you indicate that you have read and understood these conditions and choose to participate in this study.

☐ I agree

☐ I do not agree

PAGE 3

Three participants who complete the survey will be randomly selected to receive compensation in accordance with their choices made in the next question. In order to enable winners to be contacted, please provide you (preferably SSE) e-mail below.

At this point, participants are randomly assigned one of two questions, one corresponding to the control group and one corresponding to the treatment group. Below is the page presented to the control group and afterwards the treatment group page will be shown.

PAGE 4 - Control

You have been given 1000 SEK with the option of donating part of that amount (including nothing) to Save the Children Sweden (Rädda Barnen). What do you choose to do?

- ☐ I donate nothing and keep 1000
- ☐ I donate 100 and keep 900
- ☐ I donate 200 and keep 800
- ☐ I donate 300 and keep 700
- ☐ I donate 400 and keep 600
- ☐ I donate 500 and keep 500
- ☐ I donate 600 and keep 400
- ☐ I donate 700 and keep 300
- ☐ I donate 800 and keep 200
- ☐ I donate 900 and keep 100
- ☐ I donate 1000 and keep nothing

PAGE 4 - Treatment

You have been given 1000 SEK with the option of donating part of that amount (including nothing) to Save the Children Sweden (Rädda Barnen). However, if you donate, you must donate at least 300 SEK. What do you choose to do?

- ☐ I donate nothing and keep 1000
- ☐ I donate 300 and keep 700
- ☐ I donate 400 and keep 600
- ☐ I donate 500 and keep 500
- ☐ I donate 600 and keep 400
- ☐ I donate 700 and keep 300
- ☐ I donate 800 and keep 200
- ☐ I donate 900 and keep 100
- ☐ I donate 1000 and keep nothing

Open Science Framework Pre-registration

Prior to carrying out the experiment, the description, hypothesis, experimental design and empirical strategy were all pre-registered on the Open Science Framework (OSF). The pre-registration can be found below and at this link: <https://osf.io/2fyxb/>

Description

This study investigates the impact on the average donation of introducing a minimum donation amount. Several studies have been done focusing on what drives donation behaviour yet none of the proposed theories concerning charitable giving (such as altruism, warm glow etc.) provide a clear-cut prediction as to what happens to donations when a minimum restriction is introduced. The standard economic prediction (given that individuals do gain some utility from donating, otherwise no one would donate at all) is that the only impact of a minimum restriction would be that those who would otherwise donate below the minimum do not donate at all. However, studies have shown that in a pay-what-you-want (PWYW) setting (which is similar, but not identical to a donation setting) when a minimum is introduced, the average payment among those who still pay decreases (Johnson & Cui, 2013). This could potentially be due to anchoring effects, internal vs. external price references or crowding out, behavioral effects which all might exist in a donation setting as well.

In order to test what the implications of a minimum restriction on donations are, an experiment will be conducted with two groups; one control group who play a dictator game where participants are the dictators who decide whether to donate any, some or all of an endowment to charity, and one treatment group where participants play the same game but where there is a minimum donation amount should they choose to donate.

The purpose of the study is to shed more light on what drives donation behavior and how (if) it differs from regular payment settings. A rejection of the stated hypothesis (or a result where the donations are found to be higher in the treatment group) would indicate that different rules apply with regards to minimums in donation settings compared to PWYW settings. An acceptance where donations are lower in the treatment group would indicate that similar behavioral effects that drive payment behavior are still present in donation settings.

Hypothesis

The main purpose of the paper is to examine the impact of introducing a minimum in a donation setting. As such there will only be one main hypothesis; that the average donation will differ between the treatment group and the control group. The null hypothesis is that average donations are equal.

Study design

There are several theories as to why people give to charity; they might be altruistic, it might be because they feel obliged in order to maintain a desired social image or perhaps giving provides people a good feeling about themselves, a "warm glow", that incentivizes donations. Most likely motivations for charitable giving is a combination of all these factors and perhaps more. None of these explanations do however present an obvious theoretical prediction as to what might occur

with the introduction of a minimum donation amount, presenting a gap in the literature that this paper intends to fill. There is however some guidance for what might occur if we look at the impacts of minimum restrictions in pay-what-you-want settings. This is studied by Johnson and Cui (2013) and the authors show that introducing minimums into a PWYW setting reduces the average payments. The authors hypothesize that this effect is due to anchoring - simply introducing a reference point, be it a minimum or a suggested price impacts payments towards the reference.

In order to investigate what impact a minimum restriction has in a donation setting, the experimental design will use the framework of a dictator game where all subjects play the role of the dictator and a selected charity will play the role of the responder. All subjects will be provided a fixed sum of 1000 SEK (~\$100) and will then be asked to choose how to split this sum between themselves and a charitable organization (Save the Children Sweden). The control group will not receive any restrictions to their choice while the treatment group will be informed that if they choose to donate, they must donate at least 300 SEK. The answer options will be provided in 100 SEK increments. Prior to answering the question, subjects will be informed that out of all respondents, three will be randomly selected for payout in which case they will receive monetary compensation according to their choice in the experiment.

The study will be conducted via an e-mail survey sent out to all students at the Stockholm School of Economics. Students will randomly be assigned one of the two potential questions which put them either into the control or the treatment group. The survey will be written in English based on the assumption that all students at SSE should possess a fluent level English (all master's programs are currently taught in English and starting from fall 2020, all bachelor's programs will be taught entirely in English as well). The e-mail will be sent out on 2019-11-14 and the survey will be possible to respond to until 2019-12-08. The e-mail will inform students of the payout structure, that answers are anonymous and ask participants not to discuss the experiment with each other after performing it. The e-mail as well as the survey is attached.

Randomization

The chosen survey tool, Qualtrics, allows for randomization of which one of two questions each participant will be assigned. After having given consent and provided their e-mail, the survey randomly assigns participants the following question which is the main question of interest.

Data collection procedures

The data will be collected via an online survey sent out to all students at the Stockholm School of Economics via their university e-mail. Students will be informed that out of all respondents, three will be randomly selected for payout meaning that they will receive monetary compensation according to their answer to the survey; if they choose to donate 400 SEK and keep 600 SEK, 400 SEK will be donated and they will receive 600 SEK. Prior to filling out the survey, respondents will be obliged to enter their e-mail which will then both be used to randomly draw the three 'winners' as well as to contact them to enable the payout.

The study will be sent out on 2019-11-14 and will then be open for responses until 2019-12-08.

During this time period, the data itself will not be looked at, but the number of respondents will be monitored in order to estimate whether the desired number of respondents will be reached in the given time frame.

Sample size

The target sample size of this study is 200 answers, corresponding to roughly 100 answers in each subject group due to the randomization of the survey tool used. If the data collection procedure specified above is not sufficient to achieve 200 respondents within the allotted time-frame, a second subject group will be considered. Specifically, the main option for a second distribution would be to send the survey to business and economics students at Uppsala University, a large university in a town nearby Stockholm. If this is not feasible, alternative distribution options in Stockholm (such as Stockholm University or The Royal Institute of Technology (KTH)) will be examined.

Sample size rationale

There are several factors to consider when determining the target sample size. The first is the size of the population (roughly 1600) students who will receive the study. 200 corresponds to a answer rate of $\sim 13\%$ which ex ante seems like a reasonable response rate (it is less than what a recent study using a survey approach on the same subject pool got). Secondly, the question is whether 100 respondents in both groups will provide enough power to correctly reject a null hypothesis. The study by Johnson and Cui (2013) which works as a reference point in many situations for this experiment, conducts similar studies using students but in a pay-what-you-want setting. For this experiment they find significant effects with 50-100 respondents each in control and treatment groups. Their results indicate that as few as 50 answers in each group could be enough to find significant answers. As differences might be smaller in a donation setting, the target sample size is set well above this lower bound.

One consideration would be that an increased sample size reduces the average payoff of each individual which might have unintended consequences. However, as individuals themselves are unaware of the total number of respondents and because humans often tend to overestimate their chances of winning, that is not considered to be a serious flaw.

Stopping rule

The link with the survey will only be distributed to students at SSE and thus there is a somewhat strict "roof" of the maximum amount of respondents. The link could obviously be sent and shared with others but this is not very likely to occur and even if it did, receiving extra-responses would not cause a serious threat to the experiment design itself due to the randomization of the questions. Thus, there will be no termination of the data collection procedure prior to the final date for responding specified above.

Measured variables

The main variable of interest will be the average donation in each group.

Statistical models

The main hypothesis will be analysed using a Mann-Whitney U test comparing the average donation between the control and treatment groups. The selection of the test is due to the fact that the underlying data is ex ante not believed to be normally distributed (in general, dictator game responses do not follow a normal distribution). The hypothesis is that the average donation is different in the treatment group compared to the control group with the null being that of no difference, which will be treated as rejected if a p-value less than 0.05 is observed.

Inference criteria

The null in the hypotheses testing will be treated as rejected if a p-value less 0.05 is observed. This will indicate that average donations differ between the treatment group and to the control group.

Data exclusion

One potential issue is the fact that a single participant can run the experiment multiple times using the same link. Since participants are required to enter their e-mail address, once the data has been collected it will be checked to see that there are no duplicate e-mails entered. If a participant has entered the same e-mail multiple times, all answers corresponding to that e-mail will be discarded. Furthermore, the survey tool used collects data on the IP-addresses of respondents and thus that will too be used to see if anyone responded several times to the survey in which case all answers corresponding to the same IP-address will be thrown out.

Exploratory analysis

In order to provide further insight into each of the potential outcomes when testing the main hypothesis, as well as for some additional information, an exploratory analysis will be conducted in which the fraction of donations (the percentage of the respective group) at each level will be compared between the control and the treatment group. As results are presented in 100 SEK increments, for all levels of donations above the minimum, comparisons can be made. Therefore, Chi-square tests will be performed at each level of donations with the null being that of no difference between the fraction of donations of 0, 300, 400, 500, 600, 700, 800, 900 and 1000 in each group respectively and the alternative hypothesis being that there is a difference. The null will be treated as rejected if a p-value less than 0.05 is observed. As can be seen above, this exploratory analysis includes comparing the fraction of donors not donating at all (i.e. the number of donations of 0) in the control and treatment group.