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BAKALÁŘSKÁ PRÁCE

How Matching Grants and Their Size Affect Donations and Where

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Prohlášení

Prohlašuji, že jsem bakalářskou práci vypracoval samostatně a použil pouze uvedené prameny a literaturu.

V Praze dne 18.06.2010   Jakub Caisl

Poděkování

Na tomto místě bych chtěl poděkovat PhDr. Michalovi Bauerovi, Ph.D, za poskytnutí cenných rad a připomínek.

Abstract

In this work we focus on a large scale randomized field experiment described in Karlan & List(2007). Using direct mail solicitations to more than 50000 prior donors of a large U.S. non-profit organization, they examine the effects of matching grants on behaviour. They describe the effects of the matching grants in general, for the whole population, and find that matching grant size has no impact on behaviour. We use a different approach, dividing the population into subgroups by income and education and then measuring the effects of matching grant size on donating behaviour in these subgroups. We find significant heterogenity in the effects of grant size on behaviour. Also we try to apply the theory of social identity when interpreting the effects of matching grants.

Keywords: charitable giving, fundraising, matching grants, altruism, heterogenity, social identity

(H41, D12, D72, M31, L31, C93)

Abstrakt

V této práci se zaměřujeme navelkoplošný randomizovaný field experiment popsaný v Karlan & List(2007). Zkoumají efekt techniky "matching grant" na chování přispěvatelů v charitativní kampani zahrnující přes 50000 přispěvatelů velké americké neziskové organizace. Popisují výsledky v obecné rovině, pro celou populaci a zjišťují že velikost "matching grant" nemá významný dopad na příspěvky. My volíme jiný přístup, rozdělujeme populaci podle příjmů a vzdělání do různých podskupin a zkoumáme efekty velikosti "matching grant" na chování v těchto podskupinách. Zjišťujeme výraznou heterogenitu v efektech velikosti "matching grant" na chování. Také se snažíme aplikovat teorii sociální identity při interpretaci našich výsledků.

Klíčová slova: charitativní činnost, fundraising, matching grant, altruismus, heterogenita, sociální identita

(H41, D12, D72, M31, L31, C93)

Obsah

1. Introduction

Our work is, in broad terms, concerned with charitable giving in the US. Why do we write about such a topic? We believe that (not only) in the US, charitable contributions are one of the key parts of the society, serving not only in the strict sense as a help to those in need but, broadly, also as a drive in societal change, as the donations are often directed to support various social movements, serve to show one's opinion and achieve various social goals, ranging from such important global issues as social welfare, human rights, care about the environment to such 'petty' things as support for local artists, radio stations or contributing to your local church.

According to a survey carried out by the national nonprofit umbrella group Independent Sector in 2000, 89 percent of American households reported charitable contributing and 44 percent of adult population said they volunteered. Houselods contribute, on average, 2 percent of their household income and in total about 2 percent of the US GDP. Further, out of the $260.3 billions contributed, 83.2 percent was donated by individuals. These numbers give sufficiently wide evidence of how important and broad phenomenon is charitable giving in the US and how necessary it is to better our knowledge about it.

The magnitude and span of charitable actions described above is quite considerable and leads us to concerns about how to efficiently spur charitable giving. There has been tried a wide range of techniques to stimulate giving. Practical examples of these techniques include tax rebates, currently very popular seed money, more personal donations to create the feeling of reciprocity, use of social information, distinctive items to identify donators (such as bracelets) and many others. Studying such techniques to elicit donations, how they work and where they work, is crucial to perform fund-raising drives effectively. Given the size of population involved, devising efficient techniques to solicit these individual donations in various situations could bring about

significant amounts of additional funding sources. In this work we focus on one particularly promising approach, matching grants, that seems be a powerful incentive to stimulate people in donating according to the results presented in Karlan & List(2007).

Matching grant is an offer , in our case included in the solicitation letter, for the the donator to be matched in his donating by some other subject. In this experiment the offer consists of the ratio by which the donation will be matched, the maximum amount of money up to which the matching grant is valid (in other words the size of the matching grant) and a suggested donation amount. A simple example of such a matching grant could be: the amount that the individual decides to contribute will be matched by ratio 1:1 up to 25000 dollars donated by some other subject; the individual is suggested to contribute amount of 250 dollars.

Further work will proceed as follows: In section 2 we discuss our motivation and questions we would like to answer. Section 3 presents the experimental design and section 4 provides broad theoretical framework and literature review. In section 5 we proceed to presenting results and in section 6 we try to interpret them and draw some conclusions from them. In section 7 we sum up our findings and provide some concluding remarks.

2. Motivation & Questions

Our work is based on a randomized field experiment described in the paper "Does Price Matter in Charitable Giving? Evidence from a Large-Scale Natural Field Experiment" by Karlan & List(2007) and tries to elaborate on the results of this paper. We take the dataset from this paper[1] and look in more detail on some of its findings, particularly we are interested in the effects of matching grant size on the donating behaviour in various subgroups based on income and education.

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[1] We would like to thank here Dean Karlan & John A. List for sharing their dataset freely

The randomized field experiment[2] presented in this paper was conducted in cooperation with a fund-raising campaign by an US nonprofit organization that works on social and policy issues related to particular civil liberties (more details on the experimental design will be presented later). This campaign included 50000 mail solicitations for donations to the particular non-profit organization. The experiment consisted of creating various types of matching grants differing in size, ratio and suggested amount and implementing them in the campaign to see what effects they have on decisions about donating.

The results that Karlan & List show that the matching grants indeed do affect the behaviour of the subjects in donating, increasing significantly the donated amount. However, it seems that the individuals are not affected by increasing grant ratios and sizes, indeed they seem to be immune to the "scope effects". Further, the characteristics of the individuals such as income, education, race, age, etc. do not seem to affect the decisions in any significant manner.

Karlan & List are looking for the average effects the various properties of a matching grant can have on the whole population. However the general approach and its results can conceal important effects that matching grants have on different parts of the population. Our hypothesis is that the matching grant may have very heterogenous effects among various subgroups of the population, in particular when we take subgroups based on income and education. Therefore we choose a different approach to our analysis. We propose to divide the dataset into various income and education groups and look for the particular effects in these subgroups. The question that interests us are: Aren't there different patterns of giving for the rich and for the poor or for the educated and uneducated? We want to look for heterogenous effects, possibly finding some

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[2] The randomized field experiment allows us to work with a large dataset in a natural environment, i.e. without any experimenter effects. The large scale of the dataset is indeed very important for us here, as we try to study heterogenity and divide population into various subgroups and look for distinct effects in these subgroups. With small dataset this wouldn't be possible.

more sophisticated and variable patterns that can be overlooked by the general approach used in the paper described above.

Different, but also tightly related to heterogenity in our subsample, questions are: How does the size of the grant affect the amount donated? One can simply imagine various effects that the size of the grant could have on behaviour of individuals. It could serve as an indicator of the importance of the charity, as a measure of confidence or as a signal how much the contribution is needed. Can't these effect of size of the grant vary across various subgroups?

We merge these questions together as we create various subsamples based on income and education and study the influence of the size of the grant on behaviour of individuals in these subgroups. We find, contrary to the general findings of Karlan & List, that in those subsamples the size of the grant indeed matters and that belonging to different subgroups significantly alters the effects of grant size on behaviour. Actually we find two opposite trends for the high and low income group, grant size having positive non-significant effect on amount donated in the low income group and significantly negative effect in the high income group. The same holds for high and low education groups, with the exception that the positive trend in the low education group is statistically significant as well. Also we find that the interaction between these two trends is significantly negative. Thus with using various subsamples of our population instead of the general approach (focused on the population as a whole) we find significant heterogenity in effects on behaviour the matching grant size can produce in various subgroups.

Finally we try to elaborate on the explanation of why the matching grant raises the amounts donated. We argue that in US particularly, the theory of social identity can provide a very plausible explanation for this pattern of behaviour and may add some important insights on why matching grants raise the participation rate in giving.

Why is our contribution important? First, explaining the motives which lead people to charitable contributions, is, taken the scope of charitable action in US, an essential task. We feel that the social identity theory may provide important insights necessary for understanding the charitable giving, as our interpretation of the results tries to show. Secondly, the heterogenity effect shows that matching grants do not work in every situation, or at least work differently. Thus, it is necessary to ponder carefully where to employ them. If we go a bit further, we can claim this applies also to other possible fund-raising tactics such as seed money, tax rebates etc. Further research might clarify where do these approaches work better and where worse, thus allowing for their more efficient employment.

3. Experimental Design

The organization that colaborated on this randomized field experiment is a liberal non-profit US organization that focuses on issues concerning particular liberal rights. The experiment was conducted during a mail solicitation campaign that included 50083 prior donors that have contributed to the Organization at least since 1991. The individuals were randomly assigned to a treatment "match" group (33396 subjects or 67 percent of the sample) and a control group(16687 subjects or 33 percent of the sample). All letters were the same except for the treatment letters included a statement that a "concerned fellow member" will match the individuals´ donation and also the details of the match.

The specifics of the match offer were randomized along three criteria: matching ratio, the asked amount and the match size. Matching ratio was either 1:1, 2:1 or 3:1, rising regularly. The asked amount was either the highest contribution previously given by the member of the organization, or, respectively, 1.25 and 1.5 times the highest previsouly given amount. For us is crucial the third division, the one by maximum size of the matching grant. The

treatment here was randomized by four match sizes: 25000, 50000, 100000 dollars and unstated.

The authors also run a regression on various individual characteristics of the subjects included in the experiment. For example, income can be a key factor in deciding how much to donate (Auten, Sieg, & Clotfelter, 2002). Different political environments can have a crucial influence on decisions as well. The authors merged their charitable data with a)demographic data from the census, aggregated at the zip code level, b) state and country returns from the 2004 presidential election and c)data from the organization on frequency of their activities within each state. Most important for us are the data for income, e.g. median household income aggregated at zipcode level, and the education data, e.g. the percentage of population that has at least bachelor degree also aggregated at zipcode level. The fact that data are aggregated and not individual introduces some noise into our data.

4. General Framework

We will start developing our approach with a following example taken from Morgan & Sefton (2000). This example is intended as a simple demonstration of how game theory based on Nash Equilibria can fail to explain the mechanics behind the funding of public goods by charitable drives:

Example 1

We suppose that two individuals are each endowed with ten tokens. These tokens can be allocated to a private or public fund, with different returns. In case of investing the token into the private fund, subject gains one token for himslef. In case of contributing to the public fund, both individuals receive 0.75 tokens. Therefore we can construct a simple profit function which the subject chooses to maximize, specifically for this case:

$$\pi_i = 10 - x_i + 0,75(x_i + x_j)$$

Individual i chooses the amount x_i of tokens he will donate, individual j chooses the amount x_j, and choosing these amounts determines the number of tokens both of the players will end up with, π_i and π_j. As we can see, the best strategy that would generate the most tokens in general is when both players contribute all of their tokens into the public fund, thus for each token receiving 1.5 token and ending up with 30 tokens together, 15 each. However if player i decides to deflect from this strategy and keep his tokens in private fund while the individual j gives all his tokens to the public fund, he ends up with 17.5 tokens, that means better of, while individual j ends up only with 7.5 tokens, that means at a loss. Actually if player i decides to keep his money in his private fund, he will be always better off or at least equal than if he decided to donate,

no matter what amount does player j donate. In other words, not contributing is his dominant strategy. The same reasoning holds for player j and thus results in Nash Equilibrium in which no one donates nothing in the public fund, both stay with 10 tokens, that means worse of than if they contributed to the public fund. Thus the free-riding problem occurs.

As this overtly simple example(which can be equally simply extended for more individuals) tries to illustrate, in charitable decisions there is much more than economically self-interested motivations involved. Indeed, the stark non-cooperative Nash Equilibrium (as developed in Andreoni (1998)) doesn´t hold when it comes to charity, as Morgan & Sefton (2000) show in their paper, our paper (when we take the control group as subjects, since they receive no other stimulus than solicitation) supports and almost all other literature used to prepare this work confirms. Further, in our case the charity is wide in scope and concerned about intangible goods, that can´t be well measured. As the agent pool grows the actual utility from altruism falls as shown in Ribar & Wilhelm, (2002). The contribution of one individual in such a case can be expected to hardly make a difference in his actual well being, which makes contributions very hard to explain by rational maximizing intentions alone and makes us look for other motives for such a behaviour. Plus, since individual charitable donations are definitely tightly bound to American culture and charity itself is a group behaviour often connected closely with morals, social influences and moral principles can be expected to form a large part of the incentives in various type of charitable activities. We will look closely at such types of behaviour and try to evaluate which of them might be the most suitable to explain for our particular case.

As already discussed above, the social and moral dimension of the decision might be even more accentuated in the US where philantrophy has a

strong tradition, as is forcefully argued for example in *Understanding Philanthropy: It's Meaning and Mission* by Robert L. Payton & Michael P. Moody. It is widely used ranging from direct money aid to others, over supplying public goods that are not provided from the state budget, to spurring various social movements. Individual charitable giving is a very important social phenomenon as more than 89 percent of Americans donate to charity, to cite from our introduction again. Charity is, by definition, an altruistic behaviour. It is an activity that is concerned about others. However it is important not to forget that altruistic behaviour might have many motives and lots of them are not free of self-interest.

First division that comes to mind is one between soft and hard altruism (Hlaváček & kolektiv, 1999), or in other words pure and impure altruism (Andreoni, 1990). Hard altruism is concern about others that is not motivated by any self-interest, originating purely in concern for others. Soft altruism on the other hand is motivated at least partially by self-interest. We won´t be concerned much about the hard altruism in our work, as it is something that is determined at the individual level, naturally (as Hlaváček argues even genetically) and is stable, not subject to change by manipulations of the matching grant size, nor by the matching grant itself when the reasoning is taken even further. What we will be concerned about is the impure altruism, that may stem from various and often overlapping motivations such as social conformity, reciprocity, prestige, warm-glow effect, purchasing moral satisfaction, etc, as recent research has shown. As we can easily deduct, these motives might very well operate in our case of matching grants and we will take a brief look at some of the current research concerning these behavioural traits in more detail to consider their suitability for interpretation of our results.

As a first, very general notion, that can explain the pro-social behaviour we consider the warm-glow theory developed for example in Andreoni (1990). The term warm-glow captures the fact that donations do not serve only to

promote some goal or finance some public good, but also bring additional utility to the donator on their own. To say it in a simple way, it is the good feeling that people get when they donate, just because they donated. This pleasure from giving is purely internal and can be motivated by a wide range of reasons - for example self-esteem or guilt reduction. These motives definitely operate in charitable giving. Indeed, warm-glow is a very general notion and can be caused by wide array of sources. For purposes of our work, the generality of this term doesn' t stress enough the social character of charitable donations, so we seek something more focused on these aspects of the altruistic decisions.

One of these motives could be reciprocal behaviour. Reciprocity, seen as a gift exchange, as giving and being given back, can be a strong motive for giving as for example Mauss (1999) documents in his essay on psychology of giving in ancient societies. In the context of our charitable experiment, difficulties occur. Reciprocity defined in such a narrow way grows stronger when the context is more personal, directed, where there are tangible gains, as shown for example in Falk (2004). However, charitable drive that we study is a large, impersonal and for non-tangible benefits (certain liberal rights), allowing only for weak and indirect reciprocity motives. Also providing a matching grant does not trigger any direct reciprocity motives, as it is only an offer to match the contribution, not an offer to give something in return.

We can also define reciprocity in wider terms, when people act favourably in reaction to favourable behaviour, and disfavourably in case of hostile behaviour. In our case that means they donate if other people donate. For the sake of this paper we will not do so and refer to such behaviour as conditional cooperation or as social conformism – indeed it is noteworthy that the terms we examine further in this section often overlap or can substitute for each other in various contexts, so the distinctions between them are to a certain level arbitrary.

With these motives we are already getting closer to what we think is the most appropriate framework for our analysis. Fischbacher, Fehr, & Gachter

(2000) with their conditional cooperation hypothesis and Elster (1989) with account of social norms captures very precisely some aspects of decision whether to give to a charity or not.

Elster (1989) takes norms to be social if they are '... shared by other people and partly sustained by their approval or disapproval.' He states that social norms are not outcome-oriented. Also they must be divided from moral norms. To break such a social norm is usually associated with embarrassment, anxiety, guilt and shame. Also other people might take punitive action if social norm is not obeyed. This then leads to keeping the norm in place, to social conformism. Individual charitable donations can be taken as such a social norm in the US, given their spread and appreciation among the population, and thus social conformism can be source of charitable behaviour on its own.

Fischbacher, Gächter and Fehr (2000) propose a slightly different hypothesis of why people donate when others donate as well, the conditional cooperation. The conditional cooperators are willing to contribute to the public good if other people contribute as well. The more people contribute, the more likely is an individual to contribute as well. As can be seen, conditional cooperation hypothesis is very close to social conformism, but there are slight differences. In the social conformism one is forced to behave according to the norm because bad feelings or punitive action could follow. Conditional cooperation on the contrary leaves the decision to contribute or not on the individual.

In our case, this theory cannot be strictly applied, as nor the matching grant, nor it's size indicates how many other people donate for the charity. However, matching grant indeed specifies that someone else is willing to contribute and the grant size offered can be interpreted as an indirect indicator of how important the charitable drive is, so there might be some room for conditionally cooperative behaviour.

To reflect on the moral side of the decision we can cite Kahneman & Knetsch, (1992)and his theory of purchasing moral satisfaction. As Kahneman & Knetsch showed, for public goods that cannot be easily valued (like saving endangered species, reducing AIDS epidemics in Africa, etc.), the willingness to pay for achieving their provision is closely related with the moral satisfaction people attribute to achieveing them. This result can be easily extended to charitable contributions. In our case, it is quite possible that, as the charity aims at wide-scale nontangible benefits, people will decide whether to contribute and how much rather with considerations for their moral satisfaction than by employing rational calculations of benefits and costs.

Previously mentioned motives such as conformity to social norms, conditional cooperation, purchasing moral satisfaction or warm-glow effect can very well influence donator's decison in our case. Also they are not motives clearly distinct one from another, rather they overlap and variously interact with each other. The framework that we propose captures at least partially all these motives and stresses the moral and social dimension of the charitable giving. The approach we choose is the theory of social identity that comes from a recent research from social psychology on group behaviour. First, we describe briefly how social identity emerges and what it consists of and then we draw some implications for our work.

4.1. The Social Identity Theory

Through the process called social categorization we create certain prototypical images of various groups around us. We create social categories. To cite from Michael A. Hogg´s *Social Categoriztaion, Depersonalisation and Group Behaviour* 'The process of categorizing people exaggerates perceived similarities among people in the same group and differences between people in different groups' and thus the prototypical images of groups are formed. However, this is not only a process that focuses on others, it is, as is apparent

from the citation, a self-inclusive process. It involves depersonalisation, e.g. the process when we define ourselves only in the terms of our group affiliations.

We identify ourselves with certain groups and conform to their prototypical behaviours, attitudes, etc. and this image of self is called social identity. Citing Tajfel & Turner's *An Integrative Theory of Intergroup Conflict* social identity '... consists, ..., of those aspects of an individual's self-image that derive from the social categories to which he perceives himself as belonging. ' As people are often members of various social categories and groups, and these groups and categories become salient in different circumstances, social identity is very flexible and often context-dependent.

How does this connect to our paper and why is it better than for example the warm-glow theory in interpreting our results? Here again we will return to Tajfel & Turner:

' 1. Individuals strive to maintain or enhance their self esteem: they strive for a positive self-concept.

2. Social groups or categories and the membership of them are associated with positive or negative value connotations. Hence, social identity may be positive or negative according to the evaluations. '

We argue that charitable donations are at least partially motivated by the concerns of maintaining or enhancing self-esteem and positive social identity. Especially in US where individual donating has a very long and strong tradition and is one of the key parts of the society, charitable giving is very likely to be directly connected to the self-image of an individual and group behaviour.

Further, when an individual breaks some norm of behaviour that violates the prototypical behaviour that creates the positive social image of the group, he does not only loose his positive self-image, but, also contributes negatively to the overall group image, threatens the self-image of others, possibly makes them

doubt the ingroup prototypical behaviour and thus others will have the tendency to reject, or punish, him in some way. This might even lead to a paradoxical form of ingroup favoritism (a term examined in Tajfel & Turner – reflects the fact that ingroup members are judged more favourably than outgroup membres, even in minimal group conditions), called "the black sheep effect" (Marquez, Yzerbyt, & Leyens, 1988) when an individual is not only rejected by others, but also rejected more strongly than an outgroup member would be rejected if he violated the same norm. This happens exactly because the individual did not only harm his self-image but also threatened the self-image of other members of his group and therefore is judged more strictly.

To illustrate it on a simplifying example: If we create a hypothetical group called "US citizen", one of the prototypical and valued characteristics would probably be the charitable giving. Thus violating of the participation on charitable giving would go against the prototypical behaviour of such a group and would lead to a loss of the positive self-image ascribed to it. Further it will threaten the positive image of other "US citizens" who might reject, marginalize, ostracize, or in some other way punish for this kind of behaviour. For an interesting economic model trying to capture these effects on behaviour, see Akerlof and Kranton(2005).

To get even more into detail, we ask how does the social identity theory connect directly to matching grants? As we have already argued our charity experiment affects a wide spectrum of individuals who have no personal relationships or knowledge about each other. The contribution has no tangible material effect on their welfare. We have already quoted Tajfel & Turner (1979) and Hogg (2002) who confirm that social identity becomes salient exactly in such wide social group context, even in minimal group contexts.

To illustrate this clearly and in more deatil we can again take the social category of "North Americans", where individual donations do form part of prototypical behaviour from which positive self-image derives.The offer of the

matching grant and the mention of it's size then create pressure by reminding one of the social norm that he should follow if he wants to keep his positive self-image. Also it manifests that other people do follow this norm and consider it important, adding even more pressure on the individual who receives the grant offer. It is possible that if one does not donate, other members of the social group, in this case US citizens, will reject the member and punishment in form of ostracism or marginalization might occur, creating further losses in one's utility.

Since our charity is highly anonymous, it does not seem very probable that such punishment is involved, nor is there direct appreciation from others for the donation, which could considerably weaken our explanation.

However, we still argue that the explanation described above holds. The fact remains that individual charitable donating is a positively valued social norm in the US and such norms do not work only when others are looking, externally, they also get internalized, valued by the individual himself (Elster, 1989). Thus, breaking such a feeling leads to a loss in positive self-image, to feelings of shame, guilt, embarrasment, no matter whether it is broken publicly or privately, even though in the public case the loss will almost surely be greater. Even without the fear of punishment or prestige motives, matching grants and their size indeed make the norm of charitable donations salient and might increase the perceived importance of charity. In such a case the breaking of the norm can very well lead to a loss in positive self-image.

Taken these findings together we believe that social identity theory can best reflect the motives that drive the charitable behaviour in our experiment. It is not as narrow as to just simplify charitable giving to simple conforming to a social norm or purchasing moral satisfaction and unlike the warm-glow effect, it stresses both the effect of social conformism (individuals conform to the social norm, as breaking it brings about shame, embarrasment and guilt) and self-perception (individual charitable giving – the prototypical group behaviour -

creates positive self-image, is socially and morally valued) and thus reflects more accurately the mixture of motivations such as social conformism, conditional cooperation, purchasing moral satisfaction or simply prestige.

A final brief note is still necesary. We in no way take charitable donations as fully explained by these social and moral motives for behaviour. There is still space for individual decisions where and how much to donate and if to donate at all that are not influenced by group behaviour. The amount to be donated can be affected by a wide array of other motives such as purely cognitive method of reference points theory developed in Kahneman (1992), confidence and trust issues or true altruistic preferences (donating where it is needed, not where other people donate as well) to name just a few.

4.2. Experimental Evidence

To get some practical evidence from the field, we will now focus on presenting results from a few papers that study similar things as our current paper and discuss their results.

Croson & Shang (2009) have set up an experiment in a public radio fund-raising drive. They used what they call upward social information, that means they told the contributors that someone else has contributed a certain amount before them.They drew this information from 90th to 95th percentile of previous contributions, so that the amount is very probably higher than the amount previously contributed by the individual, which is why they call the social information upward. They show that indeed the average and total amount donated increased significantly when this information was provided. Further they show that this result is most probably the result of the social influence and not some other theories like anchoring. Even though they study the size of the contributions only, the mechanism they use to influence people provides individuals some similar incentives as matching grants, e.g. stresses that someone else has given(in our case is willing to give) as well and specifies how

much (grant size). These incentives are indeed shown to have a significant effect on behaviour.

In a work closely related to the experiment above Croson & Shang (2008), in another funding drive for a public radio, find the same effect of the upward social information, e. g. positive influence on size of the donations. However, they find even stronger negative effect for the downward social information, that means mentioning a lower amount than the individual has previsouly contributed. Unfortunately, again only the size of the contributions is studied, so we can make no additional links to our work. Still this experiments serves as another example of how similar incentives create significant effects on donating behaviour.

In another experiment, this time a small scale (24 participants) laboratory one, Croson, Fatás, & Neugebauer(2004) find that decisions indeed depend on the past behaviour of the subjects in the experiment, supporting our hypothesis that conditional cooperationor and/or social conformism can get involved in donating behaviour.

Frey & Meier (2004) also conduct a field experiment that tests the hypothesis of social information. At the University of Zurich the students can choose to donate to two funds, to help students in financial problems or to sponsor foreign students. In a charitable campaign designed to elicit these contributions, Bruno and Frey take 2000 students and provide them with social information, one half receives the note that 46 percent of students previously contributed and the other half a notion that 64 percent did so. In total they find a positive effect of social information on contributing, but this effect does not seem to be statistically significant. But when they divide subjects into groups based on their previous behaviours, they find that for those who are indifferent to contributing (their preferences are not clearly defined as they always contribute or never contribute) the effect indeed becomes statistically significant. Again the providing of social information partially matches the

stimula that matching grants provide by idnicating that other people donate and further, Meyer and Frey find that students do not react to such an offer homogenously, which also supports the findings in our paper (although the samples are divided on completely different criteria).

Ariely, Bracha, & Meier (2007) also conducted a laboratory experiment focused on the role of image on giving. They found out, that if the donations are made public, the contribution for the socially valued charity (American red Cross) are significantly higher than private contributions. For the 'bad' cause (National Rifle association) the private and public contributions are the same.While this demonstrates the value that individuals put on the positive social identity, it is dependent on the fact that contributions are made public, which is not our case. However, as already argued above, social norms and values act even when the contributions are anonymous.

Further, Fischbacher, Fehr, & Gachter (2000) provide similar evidence in a laboratory experiment also conducted at the University of Zurich. They elicit the amount individual would be willing to contribute when provided with various social information (the question was how much would an individual be willing to contribute if he knew the average contribution level of other individuals and there were various average contribution levels provided). They found out that roughly 50 percent of the participants are conditional cooperators (social conformers), 20 percent are ambiguous in their decisons and 30 percent are pure free riders. We see that the donation size can be significant, even though heterogenous, in it's effect. This is quite comparable to our result that size of the grant matters, but only for certain subgroups of population.

Another laboratory experiment by Chen & Li (2009) shows that when participants are matched with an ingroup member (as opposed to outgroup members) their charity concerns increase by 47 percent and their envy concerns decrease by 93 percent. Again, the results demonstrate the importance of social

identity in charitable concerns, but we have to keep in mind the limitations of laboratory experiments.

5. Results

As already mentioned in the introduction Dean Karlan & John A. List find no statistically significant influence of the grant size on amount given nor any influence of education or income on the amount donated. We take the influnce of the size of the matching grant on amount donated and study it in various subsamples of our sample. The subsamples that we take into consideration are the "extreme" parts of the income and education distribution. That means we take the low or high income and education groups and study the influence of different grant sizes on the behaviour of each of these groups. As the high income group we take the part of our sample above the 75th percentile of income distribution, as the low income group we take the subsample that is beneath the 25th pecentile of income distribution. The same distribution is used for education. We use the median household income as a measure of income and the percent of population that has at least a bachelor degree as a measure of education. Further on we will refer to these measures simply as income and edcuation.The tables of percentile distributions are presented below:

Table 1 – percentile income distribution

percentile	income
20	36789.8
25	39181
33	42254
66	59742
75	66005
80	69939

income – median household income in dollars aggregated by zipcode

Table 2 – percentile education distribution

Percentile	education
20	0.209098
25	0.235593
33	0.281537
66	0.476143
75	0.530036
80	0.568941

education – percentage of population with at least a bachelor degree aggregated by zipcode

As we will be using both the division by income and by education, it is important to make a brief notice before. These two measures are higly correlated as the Table 3 below shows. This was to be expected as the areas with higher income tend to have better schooling systems and higher education tends to produce higher incomes. We do not know which one of those is the driving factor behind our results, probably both to some extent, nor it is the topic of this work to distinguish between them. We will use both of them, as they both provide interesting, statistically significant results.

Table 3 – Correlation income-education

	income	education
income	1	
education	0.6597	1

income – median household income in dollars aggregated by zipcode
education – percentage of population with at least a bachelor degree aggregated by zipcode

Another note that relates to the following data analysis is concerned with the grant sizes and their interpretation. We have four possible sizes: 25000, 50000 and 100000 dollars and unstated. However for our purposes where we want to see how the size of the matching grant offered affects the amount

donated and the participation rate we will have to leave out the unstated size. This is due to the interpretative problems of this category from the point of magnitude. As the actual size is not specified it can be either taken as infinity or not considered at all in the decision. This problem blurs the comparison with the other sizes which are all in the same units(dollars) and thus can be compared straightforwardly and used easily in our scope analysis. This shouldn´t be taken as any serious problem for our analysis, as the three sizes provide enough data for what we want to prove and are still perfectly randomly divided. As a result, we do not analyze the results for size unstated, even though we keep it in some graphics and regressions as to convey the whole picture.
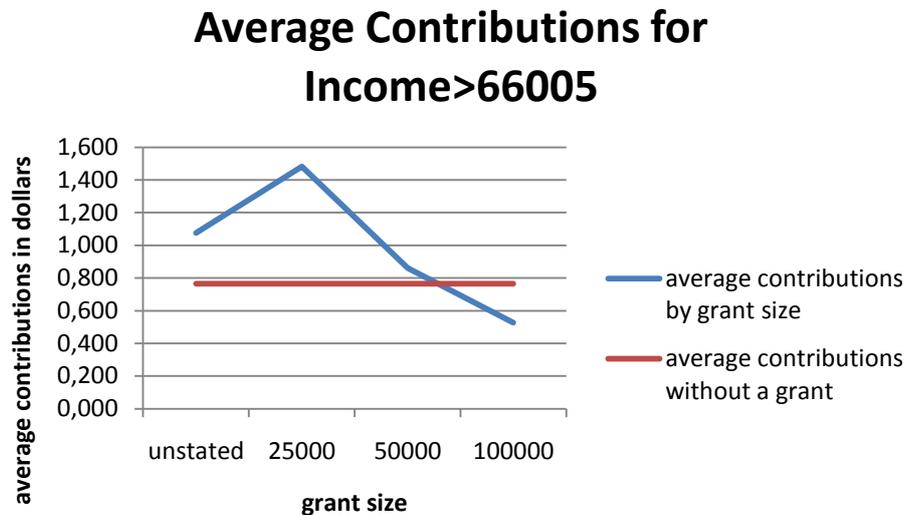
5.1. Income

First we will have a look at the income subsamples. Following graphics illustrate the tendecies which arise in the low and high income group. In the low income group the effect of the grant size on giving seems to be positive, whereas in the high income group the reverse occurs.

Graphic 1 – low income group, size-amount donated
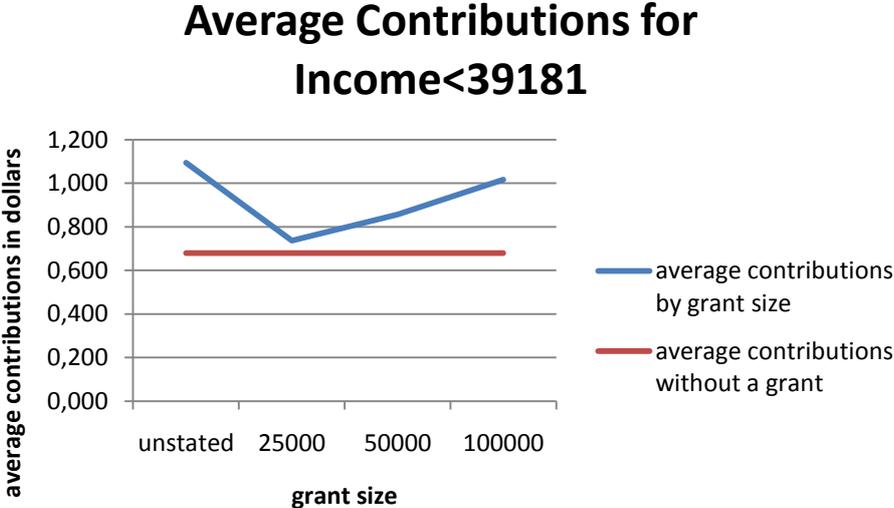
Graphic 2 – high income group, size-amount donated

Average Contributions for Income>66005

Graphics show very roughly the patterns of behaviour we would expect. To make things more precise we take our four possible treatments and employ a regression defined by the following phormula for various subgroups of income distribution:

$$amountgiven = \beta_0 + \beta_1 sizeno + \beta_2 size50 + \beta_3 size100 + \varepsilon$$

This regression gives us the differences between the results for sizes unstated (sizeno), 50000 and 100000, with size 25000 being the omitted dummy. From the results presented below in Table 4 one would expect significant negative, possibly linear relationship between grant size and amount donated for the high income group and probably insignificant but positive relationship for the low income group.

Table 4 – regression results, detailed analysis of size for income subgroups, explained varibale=amount donated

Treatment	amount given income>66005	income>69939	income<39181	income<36970
	(1)	(2)	(3)	(4)
sizeno	-0.406	-0.433	0.358	0.248
	(1.61)	(1.70)	(1.27)	(0.77)
size50	-0.622	-0.568	0.120	0.127
	(2.45)*	(2.22)*	(0.43)	(0.40)
size100	-0.954	-0.983	0.280	0.321
	(3.76)**	(3.83)**	(0.99)	(1.01)
Constant	1.483	1.467	0.737	0.752
	(8.27)**	(8.10)**	(3.71)**	(3.35)**
Observations	9359	8892	7987	6484
R-squared	0.00	0.00	0.00	0.00

Absolute value of t statistics in parentheses
* significant at 5%; ** significant at 1%

amount given – explained variable; amount given by an individual, in dollars
sizeno – grant size unstated
size50 – grant size 50000 dollars
size100 – grant size 100000 dollars

So we form a hypothesis that the size of the grant has a positive effect on the average amount donated in the low income group and a negative effect in the high income group. Also we expect the effect to be statistically significant in high income group and not significant in the low income group. To test for this hypothesis we employ, with the income specifications provided, a simple regression of sizerestricted (only grant sizes 25000,50000,100000 as already discussed above) on amount donated characterized as follows:

$$amountgiven = \beta_0 + \beta_1 sizerestricted + \varepsilon$$

As we can see in the Table 5 presented below, the results are directionally right. Indeed, for the low income group the grant size coefficient is positive and for the high income group the coefficient turns out to be negative. Also, in the case of the low income group, the result is statistically insignificant, whereas in the high income group it is strongly statistically significant. This confirms our

hypotheses. We can try for some non-linear functions of sizerestricted in our regressions to see if they don't fit our data better, possibly making the low income group trend significant. We find no such better fit (results not included). We also tried a wider linear regression to improve the precision of our model and see whether some other significant factors arent involved in the decision, and apart from a significant negative effect of percentage of black population in the high income group found no other significant effect on our analysis as shown in table 6.

Table 5 – simple regression results for income subgroups, explained variable=amount given

| | amount given | | | |
	income>66005	income>69939	income<39181	income<36970
	(1)	(2)	(3)	(4)
sizerestricted	-0.000	-0.000	0.000	0.000
	(3.56)**	(3.27)**	(1.04)	(1.03)
Constant	1.650	1.674	0.658	0.655
	(7.48)**	(6.82)**	(2.85)**	(2.43)*
Observations	6963	5737	6012	4915
R-squared	0.00	0.00	0.00	0.00

Absolute value of t statistics in parentheses
* significant at 5%; ** significant at 1%

income – median household income in dollars aggregated by zipcode
amount given – explained variable; amount given by an individual, in dollars
sizerestricted – explanatory variable; grant size restricted to sizes of 25000, 50000 and 100000 dollars

Table 6 – wider regression results for income subgroups, explained
variable=amount given

	amount given for income>66005	for income<39181
	(1)	(2)
sizerstricted	-0.000	0.000
	(2.98)**	(1.03)
average household size	-0.605	-0.254
	(0.94)	(0.53)
population % white	-2.418	-0.723
	(1.41)	(0.48)
population % black	-5.057	-0.947
	(2.12)*	(0.73)
income	-0.000	-0.000
	(0.96)	(1.04)
population % owner	2.163	1.108
	(1.21)	(0.92)
population % age18to39	1.165	-1.009
	(0.51)	(0.58)
education	1.333	0.479
	(0.91)	(0.33)
urban indicator	-0.235	-0.304
	(0.30)	(0.68)
Constant	3.729	2.690
	(1.42)	(1.35)
Observations	6051	5970
R-squared	0.00	0.00

Absolute value of t statistics in parentheses
* significant at 5%; ** significant at 1%

income – median household income in dollars aggregated by zipcode
amount given – explained variable; amount given by an individual, in
dollars
sizerestricted – explanatory variable; grant size restricted to sizes
of 25000, 50000 and 100000 dollars
population % white – explanatory variable; percentage of white people
in population
population % black – explanatory variable; percentage of black people
in population
education – explanatory variable; percentage of population with at
least a bachelor degree
population % owner – explanatory variable;percentage of house owners in
population
population % age18to39 – explanatory variable; percentage of population
with age between 18 and 39
urban indicator – percentage of population urban
all data aggregated by zipcode

As we have found two distinct opposite trends (as seen in the Graphic 3),
albeit one of them insignificant, we would like to test for the interaction of these

two trends, to see wheteher they are really statisticaly different. For this purpose we employ a following regression,

$$amountgiven = \beta_0 + \beta_1 sizerestricted + \beta_2 highincome +$$
$$+ \beta_3 highincome * sizerestricted + \varepsilon$$

, where highincome is a dummy variable with values 0 and 1, 0 standing for income lower than 39181, 1 standing for income higher than 66005. Thus the coefficient β_3 shows how much do trends interact and in case it is negative and significant then the high income group indeed has significatly more negative slope of the trend, supporting our hypothesis that the low and high income groups have follow opposite trends in their behaviour. As the Table 7 below shows, β_3 is significantly negative, so this is the case in our experiment:

Table 7 – high vs. low income group, trend interaction, explained variable=amount given

	amount given
	(1)
sizerestricted	0.000
	(1.03)
high income	0.993
	(3.10)**
highincome*sizerestricted	-0.000
	(3.20)**
Constant	0.658
	(2.81)**
Observations	12975
R-squared	0.00

```
Absolute value of t statistics in parentheses
* significant at 5%; ** significant at 1%

amount given – explained variable; amount given by an individual, in
dollars
high income – explanatory variable; values from 0 to 1, value 1 for
income>66005, value 0 for income<39181
sizerestricted – explanatory variable; grant size restricted to sizes
of 25000, 50000 and 100000 dollars
```
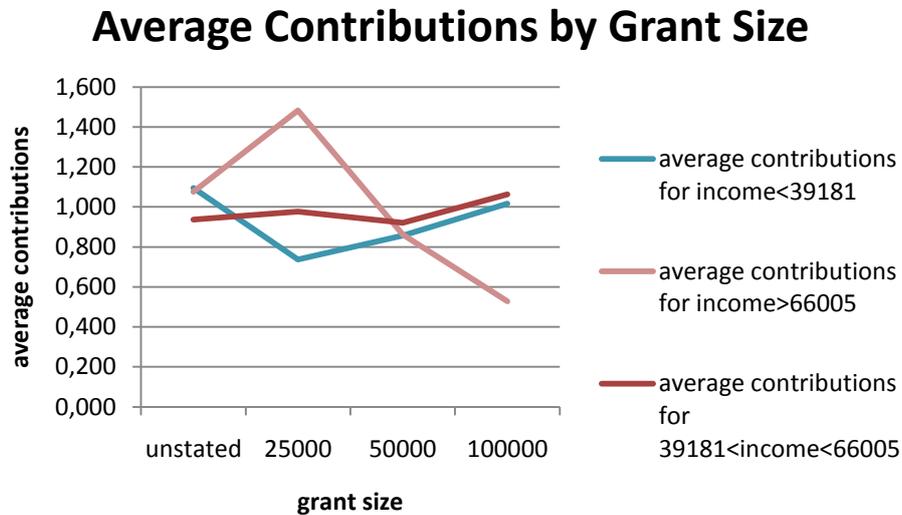
Average Contributions by Grant Size

Further, we will try to determine where these changes come from. Do they come form the changes in amount donated by individuals or from the participation rate or from both?

The charitable decision is a two stage decision. First one decides whether to donate and only then he decides how much. To account for the two stage character of the decision and for the possibility of self-selection bias, we use the two-stage Heckman model (Heckman, 1979) for the purposes of our further analysis. Self-selection can arise because when we try to establish the relationship between the average amount donated and the grant size we may easily confound the effect of the increase of participation rate with the increase of amount donated by individuals conditional on giving if we do not previously account for that increase in participation rate in our estimation. For the selection condition in the Heckman model, we put the relationship between the size of the grant and the participation rate (give?). For the final regression, we estimate the effect of size on amount given (how much?).

The results, as seen below in Table 8, indicate that the size of the grants affect significantly the participation rates, but after controlling for those effects

there turns out to be no significant relationship between grant size and amount donated. This means that the main drive behind the change of average amount donated are determined by the changes in participation rate and not by the changes of the size of the donations by individuals. We see that the changes in participation rate are significant strongly in the high income group and almost strongly in the low income group(p-value=0.056). After controlling for the effects generated by participation rate, we see no statistically significant relationship between the size and amount donated.

Table 8 – Heckman two-stage model for income subgroups, explained variables - 1st stage: participation rate; 2nd stage: amount given

	1st stage	2nd stage	1st stage	2nd stage
	amount given	partic. rate	amount given	partic. rate
	for income<39181		for income>66005	
	(1)	(2)	(3)	(4)
sizerestricted	-0.000	0.000	-0.126	-0.000
	(0.08)	(1.91)	(0.01)	(2.58)**
Constant	0.000	-2.143	-108,869.896	-1.861
	(.)	(27.11)**	(0.01)	(26.77)**
Observations	6012	6012	6963	6963

Absolute value of z statistics in parentheses
* significant at 5%; ** significant at 1%

amount given – explained variable; amount given by an individual, in dollars
partic. rate – explained variable; value 0 if individual didn't give, value 1 if individual gave
sizerestricted – explanatory variable; grant size restricted to sizes of 25000, 50000 and 100000 dollars

To repeat our results for participation rate separately and also test for the interaction of the partcipation rate trends, we perform the probit regression for the high and low income groups and study trend interaction for the participation rate with the model specified as follows:

$$\Pr\left(gave = 1 \middle| X\right) = \Phi\left(X'\beta\right)$$

X stands for our vector of regressors (sizerestricted, highincome and sizerestricted*highincome in the case of trend interaction; sizerestricted in the case of both high and low income group analysis) and gave for participation rate. Again we see that the relationships that we have already discovered hold. Negative influence of the size on participation rate in the high income group, positive almost strongly significant in the low income group(p-value 0,056) and a significant trend interaction at 5% significance level, as can be seen in table 9.

Table 9 – Probit participation rate analysis for income subgroups, trend interaction, explained variable = gave

	partic. rate income>66005	income<39181	interaction
	(1)	(2)	(3)
sizerestricted	-0.000	0.000	0.000
	(2.58)**	(1.91)	(1.61)
high income			0.139
			(1.63)
highincome*sizerestricted			-0.000
			(2.01)*
Constant	-1.861	-2.143	-2.070
	(26.77)**	(27.11)**	(29.77)**
Observations	6963	6012	12068

Absolute value of z statistics in parentheses
* significant at 5%; ** significant at 1%

partic. rate – explained variable; value 0 if individual didn't give, value 1 if individual gave
high income – explanatory variable; values from 0 to 1, value 1 for income>66005, value 0 for income<39181
sizerestricted – explanatory variable; grant size restricted to sizes of 25000, 50000 and 100000 dollars

This concludes our data analysis for two distinct income groups. To sum up, we find two opposite trends in the low and high income group, a statistically significant negative influence of grant size on amount donated in the high income group and a postive one for the low income. Further we find that these results are determined by participation rate changes. For participation rate the same two trends occur but both are statistically significant.

5.2. Education

Now we can move to analysis based on education levels. Again we label those subjects beneath the 25th percentile of education distribution as low education group and those who are above the 75th percentile as high education group. We will run through these regressions a bit more briefly as we receive very similar results, with two significant exceptions. This is not surprising given the height of correlation between income and education.

Again we perform the linear regressions for the low and high education groups:

$$amountgiven = \beta_0 + \beta_1 sizerestricted + \varepsilon$$

Where amount given stands for the amount individual gave and sizerestricted has three values in dollars, 25000, 50000, 100000, according to the grant sizes we take into consideration.

The following graphics suggest that the trends should be the same as in the case of income:

Graphic 4

Average Contributions by Grant Size

Graphic 5

Average Contributions by Grant Size
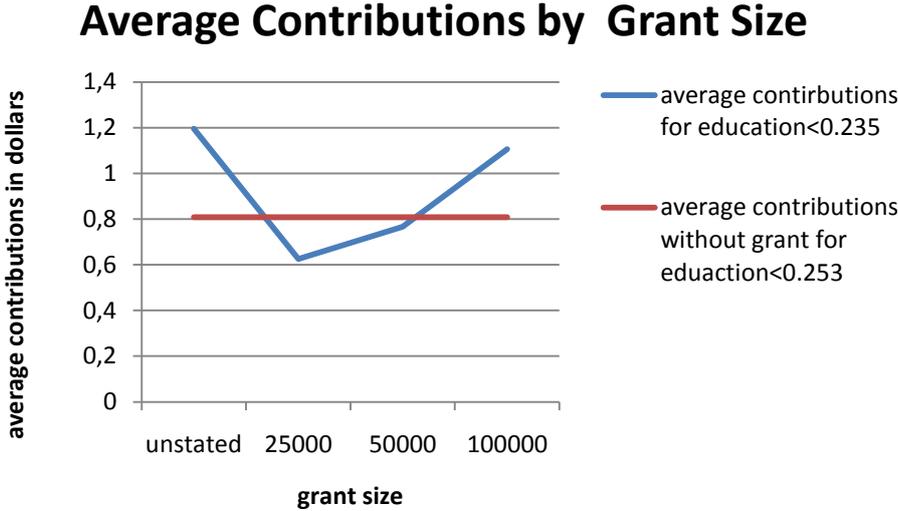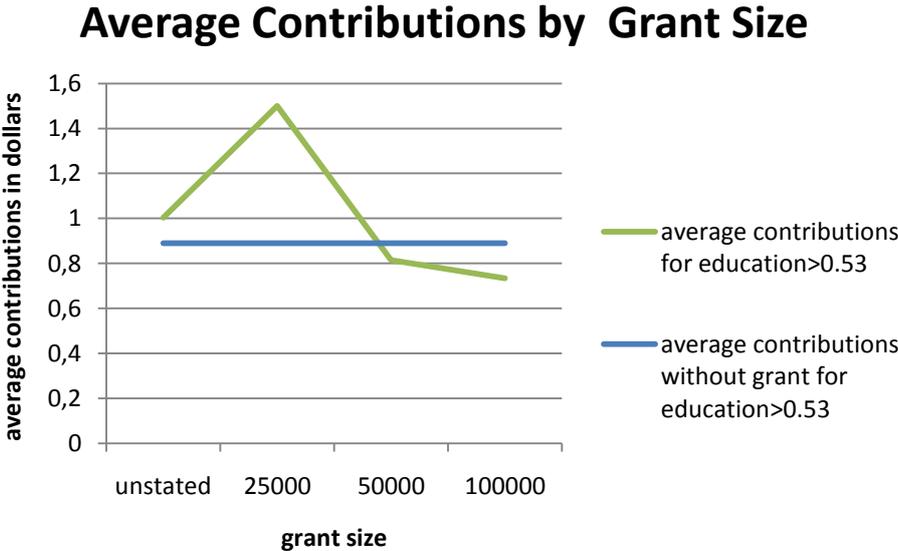
Indeed we find the same results (Table 10), with one important exception. Not only is the influence of size on amount donated significantly negative in the case of the high education group, now we also have a statistically significant, almost on the 5% level, positive influence of grant size on amount donated(p-value=0.052) in the low education group. When we try for non-linear relationships or wide regression, there are no improvements in the fit or precision of the model (results not reported here).

Table 10 – Linear regressions, subgroups by education, explained variable=amount given

|	amount given	
	education>.53	education<.235
	(1)	(2)
sizerestricted	-0.000	0.000
	(2.55)*	(1.95)
Constant	1.544	0.456
	(6.64)**	(2.08)*
Observations	6976	5998
R-squared	0.00	0.00

Absolute value of t statistics in parentheses
* significant at 5%; ** significant at 1%

amount given – explained variable; amount given by an individual, in dollars
sizerestricted – explanatory variable; grant size restricted to sizes of 25000, 50000 and 100000 dollars

If we have a look at the interaction of the patterns of behaviour in the following Graphic 6, it is almost obvious that there will be a significantly negative interaction.

Graphic 6

Average Contributions by Grant Size
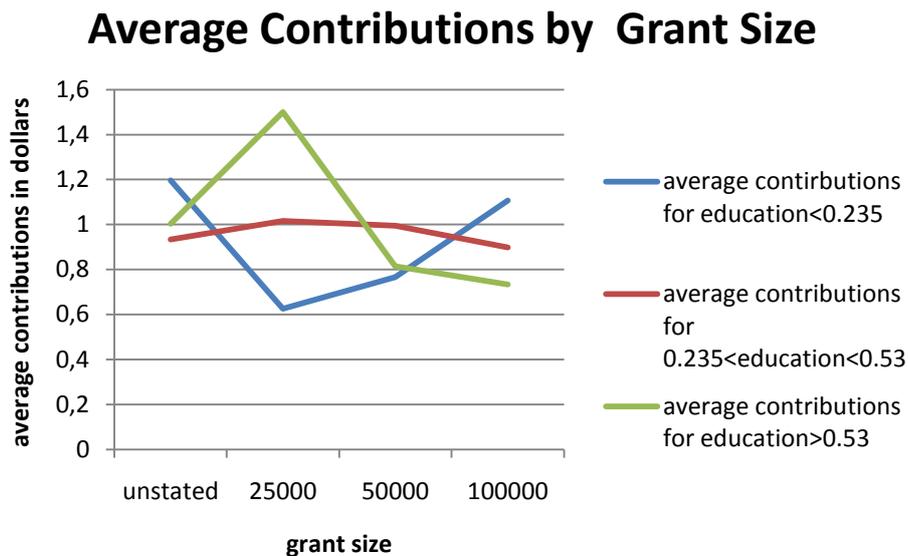
Indeed when we have a look at the Table 11 presented below, we see that we have a significantly negative trend interaction, again strongly supporting our hypothesis of two opposed trends for the high and low education group. We were running the same regression phormula as in the case of income again, only this time with a high education dummy with values 0 and 1, 0 attributed to those individuals who have their education below the 25th percentile of education distribution, 1 attributed to thos who have education above the 75th percentile. We use the following equation for our regression:

$$amountgiven = \beta_0 + \beta_1 sizerestricted + \beta_2 higheducation +$$
$$+ \beta_3 higheducation * sizerestricted + \varepsilon$$

Table 11 – trend interaction for education subgroups, explained variable=amount given

	amount given
	(1)
sizerestricted*high education	-0.000
	(2.94)**
high education	0.958
	(3.02)**
sizerestricted	0.000
	(1.50)
Constant	0.586
	(2.59)**
Observations	13771
R-squared	0.00

```
Absolute value of t statistics in parentheses
* significant at 5%; ** significant at 1%

amount given - explained variable; amount given by an individual, in
dollars
high education - explanatory variable; values from 0 to 1, value 1
education>0.53, value 0 for education<0.235
sizerestricted - explanatory variable; grant size restricted to sizes
of 25000, 50000 and 100000 dollars
```

When we try the Heckman two stage test for subgroups of education, we get different outcomes however, as seen in Table 12. In the low education group, the result is still determined by the changes in participation rate (p-value=0.06), and after controlling for the effects of grant size on it, there is no further influence of grant size on the amount given. But for the high education group, against the expectations based on our results for high income group, the participation rate seems to be irrelevant, whereas the effect of grant size on the amount given remains statistically significant. People in the high education group indeed decrease their donations when the grant size goes up, but do not stop participating. So our results are quite ambiguous in the case of education, contrary to the results for income.

Table 12 – Heckman model for subgroups of education, explained variables - 1st stage: participation rate; 2nd stage: amount given

	2nd stage amountgiven	1st stage partic.rate	2nd stage amount given	1st stage partic.rate
	education<0.235		education>0.53	
	(1)	(2)	(3)	(4)
sizerestricted	0.000	0.000	-0.000	-0.000
	(1.13)	(1.88)	(2.55)*	(1.30)
Constant	0.000	-2.154	0.000	-1.938
	(.)	(26.97)**	(.)	(27.93)**
Observations	5998	5998	6976	6976

```
Absolute value of z statistics in parentheses
* significant at 5%; ** significant at 1%

partic. rate – explained variable; value 0 if individual didn't give,
value 1 if individual gave
amount given – explained variable; amount given by an individual, in
dollars
sizerestricted – explanatory variable; grant size restricted to sizes
of 25000, 50000 and 100000 dollars
```

As we didn't get any clear result from our two-stage Heckman test, we won't perform any further analysis of the data for education.

For the purposes of our work it is enough to know that there are indeed two opposite trends in the low and high education group, negative influence of grant size on amount donated for the high education group, postive for the low education, and they are both statistically significant. Further, it is worth to mention that, contrary to the case of income, the outcomes are not determined only by the participation rate, but also by the changes in size of the donations.

6. Interpretation of Results

In the previous analysis of our data we found two distinct trends for the low and high income groups, as well as for the same education groups. The trends were the same in the low and high groups for both income and education, which could have been expected given the correlation of income and education. Therefore in our interpretation we will first focus on the trend in both of the low

groups, the we will move on to the trend in the high groups and finally we will focus on heterogenity of our results and its practical implications.

6.1. Low Income & Education

The low income and education groups both show a positive influence of grant size on the amount donated, significant in the case of education, insignificant for income. In both of these groups also, according to our Heckman model, the result is determined by the participation rate changes. If we take the participation rate as explained variable, we can see that the positive influence of size of the grant is significant for both education and income. This said, we feel we have enough evidence for the significant positive effect of the grant size on giving, particularly on participation rates.

How can we explain this positive effect on giving? In our case three particular motivations might be relevant: a) reference points theory(anchors), b) confidence, c)social and moral factors.

The reference points theory postulates that individuals can be influenced purely on a cognitive basis. As Kahneman (1992) describes it, when one receives a number, one takes it as an anchor for his subsequent decision. In our case, if there is a size of the donation mentioned, individuals start thinking about how much to donate beginning from the donation mentioned. However, as adjustments in how much to give are not large enough, just mentioning a higher number in the beginning will lead to a higher donation. Thus the larger grant sizes are metioned, the more can be the individuals tempted to donate more. This then creates the positive relationship between the amount donated and grant size. So far, so good. Until we realize that our results are explained by the changes in the participation rate and not through the sizes of the individual contributions. Also with sizes being so high, anchoring can hardly occur.When we employ these findings we can safely discard the reference point theory explanation.

The confidence motives are very common in charitable behaviour. Individuals are, understandably, worried whether their money will be used well and for the purposes they gave them for. Some of the most common methods in today's fundraising are targeted precisely at the confidence people have in charity. For example, as shown in Andreoni (1998) and practically confirmed in List & Lucking-Reiley (2002), the seed money can be viewed as a way to increase the probability that enough money will be raised to achieve the goals of the charity and that seed money can indeed have positive influence on the amount donated. In our case the confidence could very well account for the increases in the participation rate. The bigger the size of the grant, the more confidence one can have that the charity will have some real effect, as large amounts of money will be involved. We cannot rule out the confidence explanation completely, but we have some remarks that makes it improbable. We have to realize that our sample consists of previous donors, that it is organized by a large charitable organization that operates regularly and is well established. Also there is no necessary threshold for the donations (e. g. that there is no necessary amount of money to be collected otherwise the charity will go to waste, rather all the money will be always used for the purpose they were donated, no matter how much will be collected). In such circumstances the confidence motives in the decision are likely to be weak and improbable to account for the patterns of behaviour we found.

The moral and social factors, as argued before, are captured most precisely by the social identity theory. We also argued that in the US, individual charitable donations can indeed be taken as a norm of behaviour that support one's positive self-image as an American citizen. The matching grant then reminds the individual of this norm and shows him that others indeed value and conform to this norm. The changes in the sizes of the grant can be seen as improving the offer of the matching grant or just highlighting the importance of this particular charitable issue. With better matching grant offer or increased

preception of importance of the particular charity, individual will feel more pressure to donate, because it would mean a more severe breaking of the norm if he did not. Thus more contributions will be made. In contrast to the reference point theory, this explanation covers well the increases in participation rate. Also it does not suffer from the lackings of the confidence explanation, as there is no reason why it would work differently for previous donors. It could be argued that our donations are anonymous and thus cannot serve well for public appreciation. This objection we have already refuted earlier with showing that external social norms get internalized and to break such an internalized norm brings about feelings of shame, guilt, embarrassment etc.

6.2. High Income & Education

In contrast to the low income and education groups we have to explain a completely opposite trend in the case of the high income and education groups, a negative influence of grant size on amount donated. We can consider the same three motives as before to see how the result changes.

The reference point theory can be refuted immediately, as the amount given actually drops in the rising size of the grant.

On the other hand, the confidence motives seem to play the very importnat role in the decisions. However, not in the positive sense as in the low income & education groups. First, the negative trend could be caused by perceiving the high grant sizes as some sort of marketing trick to encourage higher donations. Second, the high grant sizes could generate a confidence in that the charity goal will be achieved and therefore reduce the need of the individuals to contribute. Notice the direct contrast of the explanation to the low income group, where a confidence in achieveing the goals of charity had a completely opposite effect. In the case of the wealthy or educated individuals the decisions of where to donate can be influenced by different factors, such as prestige seeking or concerns for where the donations are needed (fitting into the

theory of pure altruistic giving, e.g. giving where others don't give). If the goals of charity are already sure to be achieved, these motives could move the giving of wealthy and educated to other charitable goals.

The theory of social identity still can explain some parts of the giving decisions, but much more ambiguously than for low income & education groups. Matching grant still raises considerably the amount donated and at least a part of this effect is caused the social pressure it creates on an individual by showing him that other people donate as well. However, the positive link of the size of the grant to the amount donated no longer holds, as probably some confidence issues described above play a crucial role and replace social motivations. This result shouldn't be viewed as something very surprising, as the links to group behaviour, particularly to social conformism, are likely to be stronger in the lower education group (and probably, as low education is highly correlated to low income, also in the low income group).

6.3. Heterogenity

Karlan & List found in their work that size of the grant has no influence on the amount donated in their study. However they were looking for the average effect across the whole population. We take a different approach and look at various subgroups to see if the effects of grant size vary among them. We find that grant size has influence on amount donated, and this influence is quite different for different subgroups, actually opposite in the low and high income and education groups.

This illustrates nicely, that if we take a wide sample of data and analyze it as a whole, the underlying mechanics might escape our attention. In our case the grant size indeed has a significant effect on behaviour, but as these effects are opposite for the two subsamples, in the general picture they average out. The same problem was found in the influence of social information experiment conducted by Frey & Meier (2004), who did not find a significant influence of

social information on giving when using the whole dataset, but if they used only those people who were previously indifferent to contributing, the effect has indeed become significantly positive. Another such effect found in a large scale natural field experiment by Landry, Craig, Lange, List, Price, & Rupp (2006), who found found in a large door-to-door charitable campaign statistically significant differences for different sexes (in both the sexes of solicitors and donators, the most effective being attractive women as solicitors in combination with men as donators, unsurprisingly) in their donations. These two examples clearly illustrate how little is needed to create heterogenity in outcomes and how severely this could affect the outcome of the fundraising drive. Our paper confirms this experience.

These findings of heterogenity have important implications for practical purposes of the charitable fund-raising. It is essential to know which instrument works best and where does it work best in order to design an efficient fund-raising campaign. Our finding that matching grants differing only in size can have opposite influences in distinct subgroups is only a very narrow one. It can however be easily extended to other instruments as well. For example if we take seed money, very similiar instrument in that it also affects individuals by mentioning large amount of money involved in the charity, do they really work by influencing confidence, or do they work as a social information about the importance of the charity? And more importantly, do the effects of seed money also vary in various income and education subgroups, possibly in a similar fashion as in our case? These are only few of the many questions for further research that arise with heterogenity and can be adressed pretty well by experimental economics. It is important not to study the techniques of charitable fund-raising only in the general picture as this can conceal wide array of important findings. A more careful study of these techniques and especially the heterogenity of their effects on various subgroups could potentially improve the

efficiency of using these instruments and of the charitable fund-raising in general.

7. Conclusions

First finding of this work focuses on the theory of social identity and its application. Especially for the low income and education groups, it is shown that we can take the matching grant and its size effect at least partially working as social information that stimulates giving. The matching grant stresses that someone else is giving as well, that he conforms to the valued prototypical behaviour of the group (US citizens). The size of the grant then makes the offer of contributing even more attractive or increases the individual's perception of importance of the particular charity, thus creating even more pressure on donating. For the high income and education groups the findings are more ambigous.The matching grant still provides a strong stimula for donating more, which supports the social identity explanation but the grant size no longer increases the pressure on donating. Rather, other motives, such as confidence or allocation problems enter the decision of whether to give or not and how much.

This finding is important not only by showing that matching grant's positive effect on donations is partially derived from its links to social identity and group behaviour but it can also be extended to questioning the interpetation of other instruments in charitable fund-raising. For example, seed money have been interpreted in Andreoni (1998) as increasing the probability that the charity will achieve its goals. An alternative interpretation to be considered is that seed money indicate the social importance of the particular charitable drive, thus attracting more donations.

Second, less ambiguous, finding is that of heterogenity. In low income and education groups, the influence of the size of the matching grant on the amount donated is positive, while in the case of high education and income groups it is negative. This finding can have quite wide impilications as it raises

the question how do the matching grants in particular and fund-raising techniques in general work in different social contexts and where do they work best and where worst. To take one particular example again: seed money might very well influence the individual the same way the grant size does in our case, as they also usually mention a very large sum of money involved in charity. Do seed money work well for all the population? Or do they differ for the high and low income and education groups as well? Do they work in a similar way the matching grant size works? These questions about the heterogenous results fund-raising techniques can stimulate in different subsamples of population are particularly importnat because they can notably improve the efficiency of the charitable fund-raising. Wide area for economic experiments is still open in examining fund-raising techniques and can come with results of highly practical use.

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Appendix A – Variables and summary statistics

amount given – explained variable; amount given by an individual, in dollars

average household size – average household size, aggregated by zipcode

education – percentage of population with at least a bachelor degree aggregated by zipcode

high education – explanatory variable; values from 0 to 1, value 1 education>0.53, value 0 for education<0.235

high income – explanatory variable; values from 0 to 1, value 1 for income>66005, value 0 for income<39181

income – median household income in dollars aggregated by zipcode

partic. rate – explained variable; value 0 if individual didn't give, value 1 if individual gave

population % age18to39 – explanatory variable; percentage of population with age between 18 and 39, aggregated by zipcode

population % black – explanatory variable; percentage of black people in population, aggregated by zipcode

population % owner – explanatory variable;percentage of house owners in population, aggregated by zipcode

population % white – explanatory variable; percentage of white people in population, aggregated by zipcode

size25 – matching grant size 25000 dollars

size50 – matching grant size 50000 dollars

size100 – matching grant size 100000 dollars

sizeno – matching grant size unstated

sizerestricted – explanatory variable; grant size restricted to sizes of 25000, 50000 and 100000 dollars

urban indicator – percentage of population urban, aggregated by zip code

Table – Variables - summary statistics

Variable	Observations	Mean	Standard Deviation	Min	Max
amount given	50083	0.915694	8.709199	0	400
partic. rate	50117	0.020632	0.142149	0	1
average household size	48255	2.428978	0.378104	0	5.27
population % white	48251	0.819615	0.168546	0.009418	1
population % black	48081	0.086698	0.135847	0	0.989622
population % owner	48248	0.669388	0.193422	0	1
population % age 18 to 39	48251	0.321707	0.10303	0	0.997544
education	48249	0.391662	0.186622	0	1
urban indicator	48251	0.872012	0.258584	0	1
income	48243	54814.1	22024.32	5000	200001
highincome	25981	0.53593	0.498717	0	1
higheducation	25981	0.537508	0.498601	0	1