Charitable giving and social group size:
Does it take a lot of friends to be a successful fundraiser?

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Abstract

Much charitable giving takes place in the context of existing social groups (workplaces, churches, friends and family). We exploit a real-world setting (online fundraising) to provide the first evidence on how the size of the social group affects donations. We show that the number of Facebook friends of individual charity fundraisers has a negative effect on average donation size. This is consistent with free-riding behaviour only if donors care about the total amount raised by the fundraiser. We discuss other possible explanations.

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1. Introduction

Donations by individuals are an important source of income for charities. $229 billion was donated in the US in 2012 and £10 billion in the UK. In practice, many of these donations are collected in social settings unrelated to charitable activity – in the UK, for example, 18% of donors report having sponsored family and friends for charity, 16% gave in church, 13% gave in the workplace and 7% gave to pub collections.[2] In this paper we provide robust and novel evidence on the relationship between social group size and donations. Specifically, we look at how the size of the existing social group affects whether or not people give and how much they give. The context we look at is online individual fundraising which has become an increasingly popular activity in the UK and an important source of fundraising for many charities. A key feature of this kind of individual fundraising is that it exploits existing social networks to leverage donations to charity.

There is an extensive theoretical literature on the relationship between group size and private contributions to public goods. Models of public good provision that are based on collective consumption motives in which individuals care about the total amount of public good provided and their own private consumption, (Warr, 1982; Roberts, 1984; Bergstrom, Blume and Varian, 1986) predict that individual donations should be negatively related to the number of contributors, i.e. there is free-riding in the Samuelsonian sense (Samuelson, 1954), and that contributions approach zero as the number of contributors become very large.

However, the social group settings that we consider here differ from this classic case in two crucial respects. First, the groups are social in nature and their primary purpose for interaction is not charitable activity. Second, the members of the social group are only a subset of the total number of potential contributors to the public good, implying that any group size effect on public good provision will be a 'local' one, specific to the amount of public good funded by a subset of contributors.

There is little theoretical literature focusing on donations in these social group contexts. Exceptions are Benabou and Tirole (2006) who consider the case where people make contributions out of concerns for reputation or status and Scharf (2013) who focuses on the effect of the structure of social interactions on giving decisions. However, numerous empirical studies support the presence of social effects on giving. Among other things, donations have been found to be sensitive to:

[2] Source: Citizenship Survey, 2008-09 (Department for Communities and Local Government, 2009)

whether or not giving is publicly observable (Soetevent, 2005); social information and norms (Frey and Meier, 2004; Shang and Croson, 2008); social pressure (DellaVigna, List and Malmendier, 2012); peer effects in solicitations and donations (Meer, 2011; Smith, Windmeijer and Wright, 2012). Many of these social effects are likely to interact with social group size. Yet, to date the sensitivity of donations to the size of the social groups has not been explored.

The empirical literature on the relationship between group size and donations has focused on the classic case of public good provision in which group size is equal to the number of total contributors. In a laboratory setting, Isaac and Walker (1988) and Isaac, Walker and Williams (1994) tested the relationship using the voluntary contribution mechanism (VCM). Participants are sorted into different-sized groups. Each individual is given an endowment to be allocated between a private account, which benefits only the individual, and a public account generating a return to all members of the group. The public good in this case is 'impure' in that the number of people in the group affects the return to contributions.[3] Variation in group size can affect both the number of potential contributors (a pure size effect) and the marginal return to an individual of contributing to the public account, but both can be separately manipulated by the experimenter. The studies found that contributions to the public account are sensitive to variation in the marginal return to public contributions, but not to group size per se. Focusing on larger groups, and looking at lower marginal rates of return to public good contributions, Weimann et al (2012) reached a similar conclusion. In a real world setting, Zhang and Zhu (2010) looked at the effect of a temporary block on Chinese Wikipedia access to users in mainland China. They found a sizeable reduction in individual contributions from non-blocked Chinese-language contributors, leading them to conclude that social benefits were important in determining contributions.

In this paper, we empirically investigate the relationship between donations and group size, focusing on social groups. Our context is online individual fundraising. This works in the following way: an individual fundraiser decides on a fundraising activity to raise money for their chosen charity (often a sporting event such as running a marathon); the fundraiser sets up a personalized webpage on a fundraising website that allows donors to give online (see Appendix A1 for an example) and solicits donations, primarily from their existing social networks of friends, family and work colleagues;

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[3] For an individual, the payout from the public account is typically of the form $\frac{a}{N}\sum_{j=1}^{N} b_j$, where b_j are contributions from group members ($j = 1,\ldots,N$) and a can be chosen by the experimenter.

donations are then made through the fundraising page. The setting is public and donors can see the amounts that have already been given online and make their donation knowing that other donors will be able to see how much they have given. This context has been used previously to study peer effects in giving (Smith, Windmeijer and Wright, 2013) and endogenous anonymity (Peacey and Sanders, 2013).

Here, we focus on the relationship between the size of the fundraiser's social group and how much is donated – both the total amount raised and the number and size of individual contributions. In practice, the size of the social groups will vary considerably across individual fundraisers. Some fundraisers will have a much wider social circle that they can approach than others. We exploit this variation to look at the relationship between social group size and contributions.

We find strong evidence of social group size effects. We use the number of the fundraiser's Facebook friends, captured at the time the page is set up, as our measure of social group size. Controlling for age, income and gender, we find that the number of Facebook friends of the fundraiser is positively correlated with the number of donations to the page, but there is a negative effect on contribution size – donors in larger social groups give less. Overall, the effect on the number of donors and the amount given roughly balance out, meaning that the total amount raised does not depend on group size. This is true for pages without fundraising targets.

Why do people in larger social groups give less? We can rule out classic free-riding since the members of the social group are only a subset of the total potential contributors. More plausibly, there may be free-riding if the members of the social group care about the total amount raised by the fundraiser. But there are other possible explanations. One is that social ties are inevitable weaker in larger groups and that this has a negative effect on donation size. Another is that members of larger groups face more competing demands in terms of fundraising demands. While we cannot test these explanations formally, we think they highlight important aspects of real world social group settings that may affect donations.

The plan of the paper is as follows. The next section discusses the individual fundraising context in more detail. Section 3 describes the data and section 4 presents our main results. Section 5 concludes with a discussion of the findings.

2. Individual fundraising context

Alongside traditional fundraising activities, which involve a direct approach from a charity to potential donors, the past decade has witnessed sizeable growth in individual-led fundraising in the UK. Since 2001, more than two million individual fundraisers have raised in excess of £2 billion through online fundraising via the leading website, Justgiving.com.

In such cases, individuals initiate fundraising efforts on behalf of charities, soliciting donations to their chosen cause. Most of these donations come from the fundraiser's friends, family and colleagues. In a survey of more than 19,000 users of Justgiving,[4] 84% of those asked for a donation had been asked by a family member (of whom 87% said that they always gave when asked); 96% had been asked by a friend (67% always gave); 89% had been asked by a colleague (48% always gave) and 70% had been asked by a charity representative (only 9% always gave).

This type of individual-led fundraising has a double attraction for charities. First, they do not need lists of potential donors; individual fundraisers can exploit their existing social groups. Second, personal solicitations can be highly effective in encouraging donations, more so than solicitations from charity fundraisers (Meer, 2011). In practice, however, the size of social groups will vary widely across individual fundraisers. Some individuals will have a very large circle of friends, family and work colleagues that they can solicit; others will have much narrower social groups. The question of interest in this paper is how variation in social group size affects donors' behaviour.

Our measure of group size is the number of Facebook friends of the fundraiser. This information is collected at the start of fundraising when an individual fundraiser links their fundraising page to their Facebook page (ruling out that fundraisers make friends during the fundraising process). We take this to be a reasonable proxy for the size of an individual's social group, relying on studies that show that the size of individuals' real world social groups and the size of their Facebook networks are positively correlated (Kanai et al, 2012), although Facebook friendship groups are typically larger than real world social groups.[5] While our main findings, reported below, relate specifically to the relationship between the number of Facebook friends and donation behaviour, we interpret at least the direction of our results as having wider applicability to the relationship between social group size and contributions more generally.

[4] See Payne et al (2012)

[5] Dunbar (1992) proposed a cognitive limit on the number of people that any one indiviudal could maintain social relations with. Since Dunbar's number is often taken to be 500, less than the maximum number of Facebook friends in our sample, we performed additional robustness checks on fundraisers with <500 Facebook friends.

3. Data

Our sample for analysis comprises 566,240 donations made to 39,238 pages where the fundraiser linked their fundraising page to their Facebook page. This is after some cleaning. We remove 3,817 pages where we cannot identify the charity registration number for England and Wales. We also drop 30 pages with zero friends and 364 with zero amounts donated. We remove outliers, including pages with individual donations of £170+ (top 1%), pages which raised £3,241+ (top 1%) and pages with fundraising targets of £100,000 or more (37 pages).

We have all information that is publicly available on the fundraising pages. This includes the name of the charity, whether or not there is a fundraising target, the number of donations and the total amount raised. We also have information on all the donations made online to the pages, including the date the donation was made, the amount given and the name of the donor where available (just over 7% of donations are made anonymously).

Table 1 provides basic summary statistics for the cleaned sample. A typical page has ten donations and raises just over £130 in total. The majority of pages have a fundraising target – typically £300. We discuss below how target-setting responds to group size and may in turn affect donation behaviour; in our analysis we look separately at pages without fundraising targets as a robustness check.

Table 1 also provides information on the number of Facebook friends in our sample of fundraisers. Figure 1 compares the (mean) number of Facebook friends among fundraisers with the (mean) number of Facebook friends in the wider population. For the youngest age group (aged 18 – 34), the number of Facebook friends in the Justgiving sample is broadly representative of the population. This implies that these individuals do not only link their fundraising page to a Facebook page when they have an above-average number of friends. Older fundraisers look more selected in terms of the number of their Facebook friends – this may be selection into fundraising or into linking to Facebook. As a robustness check, we repeat our analysis only on the younger group of fundraisers.

Justgiving classify individual fundraising activities into different types. Most involve sporting activities. Running events (particularly marathons) are the most common (39.5% pages), followed by Walking (14.8%) and Cycling (11.4%). Other specified sporting events include Parachuting (2.3%), Swimming (1.8%) and Triathlon (1.6%). Non-sporting activities include Memorials (3.9%), Appeals (0.5%) and Anniversaries, including weddings and birthdays (0.3%). There is also a substantial

category of "other" activities (24.0%). Table 2 shows variation in fundraising behaviour (donation size, number of donations and total amounts raised) across these different event types. Individuals doing triathlons typically attract the largest number of donations and raise the most money in total. Anniversaries are associated with the largest (mean) amounts donated.

Justgiving also collects additional demographic information on the fundraiser including their gender, their age and their household income, based on a household-specific market research classification. Table 2 shows that there is variation in fundraising behaviour – and number of Facebook friends – across these characteristics; our main empirical results therefore include these characteristics as controls in looking at the relationship between group size and donations.

4. Main findings on group size and donations

We are interested in studying the relationship between social group size and total donations. We define N_i as the number of Facebook friends of fundraiser *i*, our measure of social group size; $n_i \leq N_i$ is the actual number of donations made to that fundraiser's fundraising page and $p_i = n_i / N_i$ is the proportion of the social group that gives. The total amount raised by an individual fundraiser *i* is equal to $G_i = \Sigma_j g_{ji}$ where g_{ji} indicates the contribution of donor *j* to fundraiser *i*'s fundraising page.

The key relationships between social group size and (different aspects of) donations to the fundraising pages are presented in Figure 2 and explored further in a series of OLS regressions, summarized in Table 3. We focus on four outcomes – the number of donations to a page (n_i), the proportion of the social group that gives (p_i), contribution size (g_{ji}) and the total amount raised by the fundraiser (G_i).

For outcomes at the fundraising page-level (number of donors, donors as a proportion of FB friends and total amount), we estimate the following specification:

$$y_i = \alpha + \beta N_i + \gamma' X_i + u_i$$

where X_i is a vector of controls for the characteristics of the fundraiser and the fundraising page, including age, household income and gender of the fundraiser and whether the fundraising page has a target, charity size, overseas charity and event type. We also include a set of month and year dummies.

For outcomes at the donor level (contribution size), we estimate the following specification:

$$y_{ij} = \alpha + \beta N_i + \gamma_1' X_i + \gamma_2' Z_{ij} + \varepsilon_{ij}$$

where Z_{ij} includes additional controls for the gender of the donor[6] and whether the donation is made anonymously. We cluster standard errors at the page level.

Table 3, Column (I) presents specifications which include only the number of Facebook friends and month/year dummies. Column (II) adds the additional controls. Column (III) presents regressions on a sub-sample of pages without fundraising targets allowing us to observe the underlying relationship between group size and donations independent of the effect of having a target on the page. This is our preferred specification. Further exploration of the data highlights group size effects in target-setting behaviour.[7] Specifically, in larger groups it is more likely that a fundraising target is present and the targets tend to be bigger. Both of these are likely to affect donations.

The main findings are:

(1) The number of donors is positively correlated with group size, although the magnitude is small. Focusing on our preferred specification in column III, the results imply that moving from the 25th to the 75th percentile in the distribution of Facebook friends (from 137 to 412 friends) translates into 0.7 extra donations. This small effect may reflect the fact that an individual's Facebook network is typically larger than their real world social network – closer friends, family and colleagues who may be more likely to respond to a solicitation for donations. Nevertheless, the result indicates that the number of Facebook friends picks up something meaningful about an individual's social group size that affects donor behaviour.

(2) The proportion of the group that contributes is negatively correlated with group size. This follows directly from there being only a small positive effect of increasing group size on the number of donations.

(3) Contribution size is negatively correlated with group size. The magnitude of the estimated coefficient implies that moving from the 25th to the 75th percentile in the distribution of Facebook friends of the fundraiser reduces the amount that each donor to that page gives by £1.10 on average.

(4) The total amount raised is invariant to group size. This relationship holds for pages without fundraising targets. Where pages have targets, the coefficient is positive but this may be driven by the target. The flat relationship between group size and total amount raised follows from the fact

[6] We use the donor's name to assign gender.

[7] Results available on request.

that effects (1) and (3) broadly cancel each other out. Larger groups attract more donations but the average donation size is smaller.

To what extent can we treat group size as exogenous and so interpret these as causal relationships? The advantage of using the number of Facebook friends at the start of the fundraising campaign size is that it is unlikely to be affected by individual fundraising activity. The only exception would be if individuals proactively added to their Facebook friendship networks prior to beginning fundraising. We cannot rule this out but we consider it to be unlikely. More plausibly, $\boldsymbol{N_i}$ may be correlated with other characteristics of the fundraiser and/or their donors that also affect donations to the page (for example, young people typically have more friends and may also have younger friends who give less). However, our results are robust to controlling for key fundraiser characteristics which proxy for donor characteristics under the assumption of network homophily.

It is possible that there are other characteristics of the fundraiser or the members of their social group that we cannot control for and that may be correlated with both the number of Facebook friends (social group size) and how much is donated. The literature suggests a number of potential candidate factors that affect social group size including popularity (Conti et al, 2012), narcissism (Carpenter, 2012) and brain size (Kanai et al, 2012), but none of these plausibly explains the strong negative relationship between group size and contributions. We therefore interpret our findings as saying something about the effect of group size on donations to the fundraising page.

Table 4 summarizes the results of a number of robustness checks. We focus on the relationship between group size and the amounts contributed to the fundraising page. Our sample excludes pages with targets. The results show that the main finding (Table 3, column III) is robust to focusing only on fundraisers aged < 35, who are less selected relative to the population in terms of the number of their friends and on fundraisers with fewer than 500 Facebook friends.

Table 4 also presents the results of a set of regressions that look at the relationship between the amount given and group size by order of the donation on the page – selecting only the first donations to a page, the second donations to a page and so on, up to the fifth. We find that the negative relationship holds in all cases. Showing that this is true even for the first donation to each page is important since later donations may be affected by how much has previously been given (Smith et al, 2013). One implication is that the negative relationship between contributions and group size cannot be explained by there being more donations and a general decline in donation

amount across the page. Nor is this finding consistent with there being "core" and "periphery" donors within social groups (assuming that core donors give first, as seems reasonable).

5. Discussion

This paper has provided robust evidence on the effect of social group size on contributions to public goods in a real world setting. In particular, contributions are smaller in larger groups. The social dimensions of giving and, more specifically, local group effects appear to play a significant role in shaping donation choices.

In the specific context of individual fundraising that we examine, it is unlikely that a collective consumption motive drives donation responses to an individual fundraiser's efforts. The standard model of non-cooperative giving choices (Bergstrom *et al*, 1986) posits that individuals care about their private consumption, $c_j = y_j - g_j$, where y_j is disposable income, and about collective consumption, $G = \Sigma_j g_j$, i.e., they each choose a donation level g_j that maximizes a utility function $U_j(c_j, G)$ taking other donors' decisions as given. This setting then predicts that individual donations will fall with the number of individuals contributing.

However, in the setting we are studying here, the donors supporting a fundraiser's particular charity by contributing to the fundraiser's 'event' comprise only a subset of the total number of donors to the charity. Fundraisers often choose to raise money for large, national charities (the most popular charity is Cancer Research UK, for example). In such situations, the amount of money raised by an individual fundraiser is often tiny relative to the charity's total income and the total number of potential donors to the charity is not likely to be correlated to any one fundraiser's Facebook friends.

To rationalize our findings in terms as a free-riding result, we need to posit that a donor, j, separately cares about the total size of donations within the group to which she belong, as defined by fundraiser i, i.e. $G_i = \Sigma_j g_{ji}$, as well as about the overall size of donations to the given cause, $G = \Sigma_i G_i$, i.e. they each choose a donation level g_j that maximizes a utility function $U_j(c_j, G_i, G)$, where the second argument represents a separate "local" (within group) effect of donations. By standard arguments, such a framework would predict a local free-riding effect, i.e. a negative relationship between N_i and the average size of g_{ji}. This would be possible if donors care about the Facebook friend doing the fundraising, and that she in turn obtains some direct utility or "warm glow" from fundraising success. However, other explanations are also plausible.

Firstly, fundraising in our context is a social activity in which case group size may interact with some of the social effects associated with donations, such as signalling wealth/generosity or projecting social image.

Secondly, the existing social relationship between fundraiser and donors may also influence donor behaviour and may be affected by group size. In real world groups (unlike, for example, in the laboratory), the strength of social ties within a group will be (negatively) correlated with group size. With limited time and resources, social ties in larger groups are inevitably weaker than in smaller groups. People in a fundraiser's social network may, therefore, give less when the network is large simply because there is greater social distance between them and the fundraiser. The "strength of weak ties" emphasizes the positive effects of large networks for information diffusion – about job opportunities in Granovetter's classic study (Granovetter, 1973). A recent study of internet ties also found that people with larger networks were more likely to get help across a wide range of activities where information is important (finding a new place to live, changing jobs, buying a personal computer). However, in the case of asking for a donation (which may be more akin to asking for a favour), the evidence presented here suggests that strong ties in small networks may compensate for network size.

Finally, another empirical characteristic of the members of large Facebook friendship groups is that they themselves tend to have more Facebook friends (Ugander et al, 2011). In this case, social group size may be negatively correlated with donations because the members of larger groups face more fundraising requests from their (other) friends.

We cannot empirically distinguish between these alternative explanations in this naturally-occurring setting. But they highlight key aspects of real world social group settings that are likely to be important in determining contributions to public goods and that could potentially be incorporated into future laboratory settings.

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Figure 1: Mean number of Facebook friends, by age

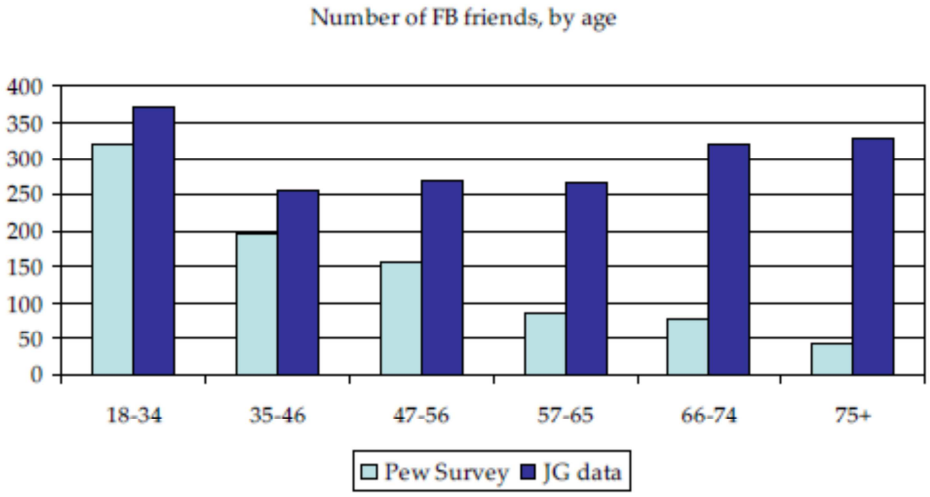

Figure 2: Relationship between group size and donations

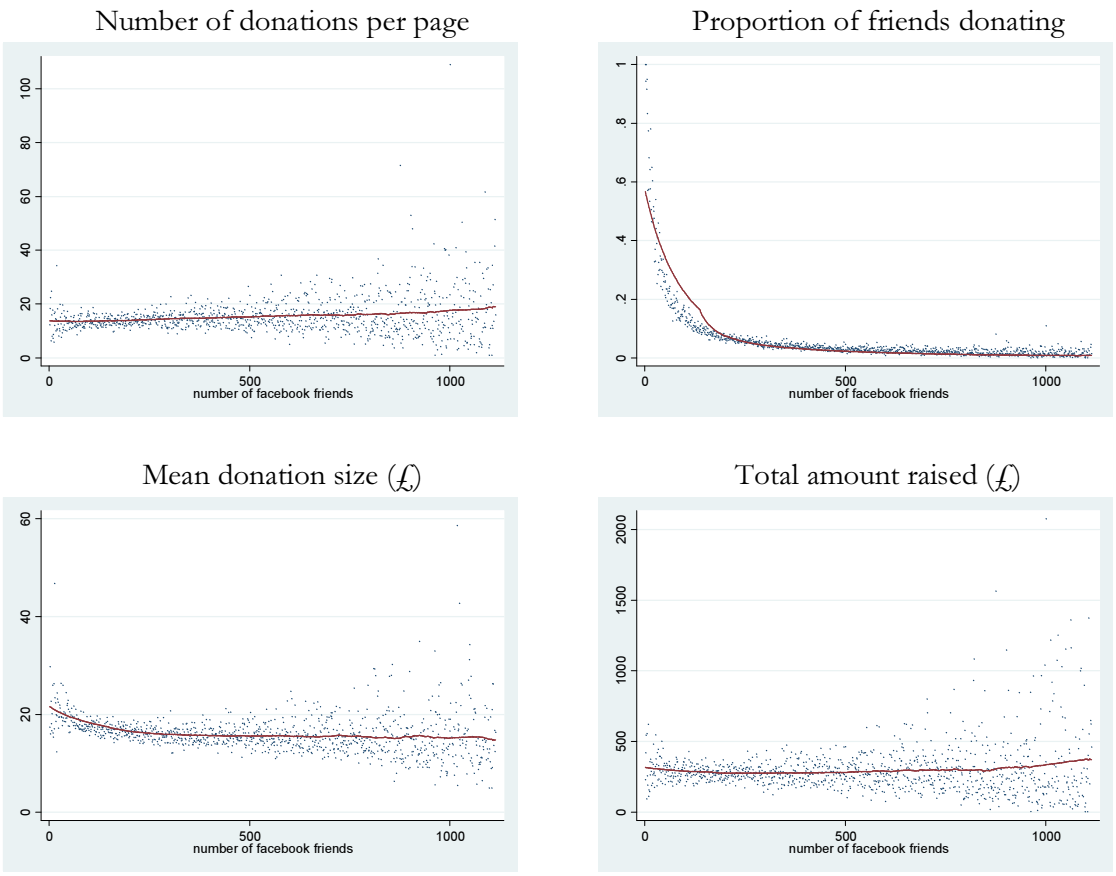

Table 1. Basic summary statistics – fundraising pages

	Mean	St. dev.	Min.	1st pctile	Med.	99th pctile	Max.
Number of donations per page	14.5	16.5	1	1	9	79	308
Total raised online per page	£347.4	£831.9	£2	£5	£134	£2,200	£3,222
Online donations	17.7	18.2	1	2	10	100	170
Prop. of pages with target	0.719						
Target amounts	£719.4	£2480.6	£0.1	£50	£300	£5,000	£100,000
Number of friends	329.1	316.2	1	24	251	1,410	5,695
Number of pages	39,238						
Number of donations	566,240						

Table 2: Variation in fundraising behaviour

	Proportion of sample	Number of donations	Total amount raised (£)	Mean donation (£)	Number of friends	Source of data
Male fundraiser	0.473	16.2	328.6	18.3	342.6	Information from
Female fundraiser	0.526	13.0	246.4	16.9	315.2	Justgiving
FR Age						
18-25	0.149	13.1	231.6	15.6	481.5	Age classification
26-30	0.172	14.4	265.5	16.7	361.6	based on postcode
31-35	0.149	15.6	300.0	17.6	311.8	and address
36-40	0.166	15.0	303.0	18.1	266.3	
41-45	0.137	14.6	304.9	18.7	273.5	
46-50	0.094	14.5	312.0	19.0	297.0	
51-55	0.050	14.4	313.5	19.2	276.2	
56-60	0.028	14.6	301.7	18.7	255.5	
61-65	0.018	13.4	289.2	19.4	304.7	
66-70	0.012	13.6	282.5	17.8	314.8	
71-75	0.007	13.2	261.1	17.5	317.8	
76+	0.018	15.5	296.9	17.1	335.0	
FR Hhold income						
<£10K	0.071	12.3	215.5	15.7	372.4	Income
£10K-£15K	0.036	12.1	213.6	15.9	403.2	classification based
£15K-£20K	0.151	13.0	235.4	16.0	367.0	on postcode and
£20K-£25K	0.178	13.2	247.6	16.7	333.3	address
£25K-£30K	0.164	14.1	267.4	17.0	315.8	
£30K-£40K	0.120	15.3	299.9	17.5	302.2	
£40K-£50K	0.078	15.4	305.8	18.0	300.2	
£50K-£60K	0.120	16.7	358.0	19.3	295.3	
£60K-£75K	0.064	18.2	436.3	21.6	313.9	
£75K+	0.016	21.1	526.8	23.2	316.9	
Event type						
Anniversaries	0.003	12.5	361.8	26.9	260.3	Justgiving
Appeals	0.006	12.0	216.3	15.4	416.3	classification
Memorials	0.038	17.3	386.0	19.3	349.9	
Cycling	0.113	13.8	282.3	18.7	269.1	
Parachuting	0.024	12.5	220.8	15.9	406.7	
Running	0.376	15.9	304.8	17.6	329.4	
Swimming	0.018	13.3	231.3	16.6	283.7	
Walking	0.170	10.8	212.6	17.1	283.7	
Triathlon	0.013	19.7	433.1	20.3	299.0	
Other	0.239	15.0	303.9	17.5	391.6	
Charity size						
Small						Classification based
Medium						on matched charity
Large						commission data
Major						
Donor gender						
Male	0.311			20.0		Assigned based on
Female	0.393			15.3		donor's first name
Anonymous	0.073			12.8		
Unknown	0.222			20.5		

Table 3. Main regression results (OLS regressions)

	Number of donations (n_i)			Proportion of friends donating (p_i)			Total amount raised (G_i)			Amount given (g_i)		
	(I)	(II)	(III)	(I)	(II)	(III)	(I)	(II)	(III)	(I)	(II)	(III)
	All pages	All pages	No target	All pages	All pages	No target	All pages	All pages	No target	All pages	All pages	No target
Friends/100	0.445***	0.508***	0.251***	-0.024***	-0.023***	-0.019***	2.094*	4.703***	0.832	-0.448***	-0.297***	-0.399***
	(0.038)	(0.040)	(0.060)	(0.000)	(0.000)	(0.001)	(0.999)	(1.024)	(1.528)	(0.026)	(0.026)	(0.051)
Target (0/1)		4.745***			0.027***			105.172***			0.706***	
		(0.183)			(0.001)			(4.702)			(0.122)	
Male FR		2.238***	1.760***		0.018***	0.015***		61.532***	44.241***		0.660***	0.628**
		(0.169)	(0.247)		(0.001)	(0.002)		(4.347)	(6.294)		(0.108)	(0.217)
Age 26-30		1.593***	1.843***		-0.006**	-0.001		34.792***	33.899**		0.573**	-0.116
		(0.290)	(0.442)		(0.002)	(0.004)		(7.474)	(11.250)		(0.181)	(0.372)
Age 31-35		3.016***	2.081***		-0.001	-0.000		64.674***	39.858***		0.953***	0.380
		(0.304)	(0.452)		(0.002)	(0.004)		(7.822)	(11.510)		(0.186)	(0.373)
Age 36-40		2.420***	1.520***		0.009***	0.005		61.284***	41.284***		0.962***	0.521
		(0.300)	(0.443)		(0.002)	(0.004)		(7.740)	(11.262)		(0.196)	(0.378)
Age 41-45		1.963***	0.981*		0.015***	0.007		57.214***	33.233**		1.230***	0.816*
		(0.316)	(0.468)		(0.003)	(0.004)		(8.129)	(11.905)		(0.207)	(0.413)
Age 46-50		1.907***	0.887		0.031***	0.019***		68.016***	32.188*		1.711***	0.534
		(0.348)	(0.508)		(0.003)	(0.005)		(8.956)	(12.932)		(0.245)	(0.444)
Age 51-55		1.663***	1.743**		0.025***	0.017**		63.325***	59.261***		1.837***	1.215*
		(0.423)	(0.616)		(0.003)	(0.006)		(10.903)	(15.667)		(0.299)	(0.609)
Age 56-60		2.658***	2.834***		0.039***	0.030***		73.348***	69.988***		1.820***	2.590***
		(0.533)	(0.792)		(0.004)	(0.007)		(13.736)	(20.145)		(0.330)	(0.682)
Age 61-65		1.659**	0.000		0.038***	0.025**		71.792***	4.788		2.673***	0.703
		(0.632)	(0.888)		(0.005)	(0.008)		(16.288)	(22.591)		(0.402)	(0.689)
Age 66-70		1.235	4.551***		0.018**	0.040***		62.270**	167.435***		1.903***	2.926*
		(0.766)	(1.109)		(0.006)	(0.010)		(19.744)	(28.235)		(0.554)	(1.422)
Age 71-75		1.729	-0.348		0.022*	0.007		58.276*	-3.941		1.613*	-0.759
		(1.059)	(1.463)		(0.008)	(0.013)		(27.279)	(37.236)		(0.746)	(1.308)
Age 76+		3.243***	1.875*		0.017**	0.017		77.245***	55.108*		1.288**	0.799
		(0.635)	(0.947)		(0.005)	(0.009)		(16.363)	(24.099)		(0.423)	(0.863)
Inc_10-15K		-0.055	-0.035		0.003	0.001		-0.318	0.149		0.368	0.365
		(0.527)	(0.746)		(0.004)	(0.007)		(13.576)	(18.973)		(0.359)	(0.735)
Inc_15-20K		0.462	0.478		0.004	0.001		14.272	14.074		0.325	0.223
		(0.367)	(0.516)		(0.003)	(0.005)		(9.449)	(13.134)		(0.239)	(0.480)
Inc_25-30K		0.543	0.645		0.003	0.004		20.364*	17.285		0.634**	0.464
		(0.358)	(0.502)		(0.003)	(0.005)		(9.214)	(12.783)		(0.238)	(0.476)
Inc_30-35K		1.465***	1.559**		0.010***	0.008		39.786***	34.747**		0.873***	0.826
		(0.362)	(0.507)		(0.003)	(0.005)		(9.331)	(12.904)		(0.242)	(0.486)
Inc_35-40K		2.678***	3.205***		0.020***	0.014**		72.477***	70.986***		1.213***	0.912
		(0.381)	(0.534)		(0.003)	(0.005)		(9.826)	(13.587)		(0.244)	(0.489)
Inc_40-50K		2.636***	2.603***		0.022***	0.018**		74.029***	57.051***		1.701***	1.352*
		(0.418)	(0.600)		(0.003)	(0.005)		(10.767)	(15.270)		(0.267)	(0.546)
Inc_50-60K		3.594***	3.106***		0.028***	0.024***		117.017***	95.487***		2.788***	2.853***
		(0.383)	(0.543)		(0.003)	(0.005)		(9.856)	(13.826)		(0.253)	(0.537)
Inc_60-75K		4.953***	3.117***		0.046***	0.024***		187.258***	135.572***		4.651***	5.080***
		(0.443)	(0.654)		(0.004)	(0.006)		(11.424)	(16.633)		(0.300)	(0.660)
Inc_75K+		7.603***	4.273***		0.067***	0.053***		270.153***	156.658***		6.179***	6.300***
		(0.701)	(1.017)		(0.006)	(0.009)		(18.067)	(25.887)		(0.502)	(1.036)
Appeals		4.085*	3.985		0.008	0.022		-19.929	-28.397		-9.074***	-13.566***
		(1.803)	(2.226)		(0.014)	(0.020)		(46.461)	(56.648)		(1.639)	(2.974)
Memorials		6.080***	6.651***		0.017	0.029*		80.875*	145.304***		-5.196***	-5.837*
		(1.455)	(1.628)		(0.012)	(0.015)		(37.487)	(41.433)		(1.453)	(2.460)
Cycling		2.027	1.348		-0.003	0.001		-48.604	-49.815		-7.422***	-10.589***
		(1.419)	(1.601)		(0.011)	(0.015)		(36.555)	(40.747)		(1.432)	(2.434)
Parachuting		0.499	0.898		-0.010	0.000		-95.328*	-41.014		-8.393***	-10.752***
		(1.496)	(1.836)		(0.012)	(0.017)		(38.542)	(46.732)		(1.442)	(2.499)
Running		2.794*	2.750		-0.004	0.008		-52.144	-23.730		-7.892***	-10.394***
		(1.402)	(1.570)		(0.011)	(0.014)		(36.120)	(39.946)		(1.424)	(2.426)
Swimming		1.884	2.693		-0.011	0.009		-87.130*	-12.146		-8.806***	-10.370***
		(1.518)	(1.755)		(0.012)	(0.016)		(39.121)	(44.671)		(1.471)	(2.503)
Walking		0.443	-0.312		-0.016	-0.009		-76.609*	-77.808		-7.933***	-11.749***
		(1.411)	(1.583)		(0.011)	(0.014)		(36.347)	(40.278)		(1.428)	(2.428)
Triathlon		6.724***	6.173**		0.026*	0.045**		66.856	78.770		-6.236***	-7.955**
		(1.566)	(1.887)		(0.013)	(0.017)		(40.337)	(48.026)		(1.471)	(2.564)
Other		2.108	1.911		-0.001	0.007		-47.564	-31.658		-7.746***	-10.314***
		(1.407)	(1.579)		(0.011)	(0.014)		(36.239)	(40.193)		(1.426)	(2.431)
Med charity		-1.725***	-1.383**		-0.010**	-0.012*		-49.613***	-51.557***		-0.707**	-0.438
		(0.376)	(0.532)		(0.003)	(0.005)		(9.681)	(13.546)		(0.241)	(0.453)
Large charity		-1.814***	-1.283*		-0.010***	-0.011*		-51.987***	-48.880***		-0.544*	-0.540
		(0.352)	(0.500)		(0.003)	(0.005)		(9.073)	(12.731)		(0.219)	(0.409)
Major charity		-3.058***	-2.390***		-0.018***	-0.020***		-76.785***	-66.766***		-0.745***	-0.503
		(0.352)	(0.507)		(0.003)	(0.005)		(9.059)	(12.890)		(0.218)	(0.410)
Size unknown		-1.224***	-1.325**		-0.008**	-0.008		-24.576**	-43.608***		-0.021	-0.228
		(0.340)	(0.489)		(0.003)	(0.004)		(8.752)	(12.434)		(0.211)	(0.392)
Overseas char		0.008	0.533		-0.009	-0.002		61.595***	73.231**		2.874***	4.212***
		(0.543)	(0.925)		(0.004)	(0.008)		(13.981)	(23.546)		(0.403)	(1.060)
Female											-4.362***	-4.126***
											(0.071)	(0.157)
Anonymous											-6.591***	-5.569***
											(0.149)	(0.268)
DK gender											0.326***	0.241
											(0.088)	(0.197)
Constant	13.129***	6.548	5.928	0.157***	0.101***	0.083	280.780***	331.470***	187.213	19.211***	31.856***	28.902***
	(0.142)	(3.560)	(6.122)	(0.001)	(0.029)	(0.056)	(3.703)	(91.726)	(155.806)	(0.103)	(3.967)	(4.165)
N	38488	36914	10341	38488	36914	10341	38488	36914	10341	552022	530629	106179

Standard errors, clustered at the page level, in parentheses. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. All regressions additionally include year and month dummies. For variable definitions, see Table 2.

Table 4. Robustness checks (OLS regressions)

Dependent variable = Amount donated (£)

	Younger Fundraisers	FB friends <500	By order of donation on fundraising page (1)	(2)	(3)	(4)	(5)
Friends/100	-0.328***	-0.451***	-0.373***	-0.404***	-0.516***	-0.357***	-0.370***
	(0.064)	(0.106)	(0.085)	(0.085)	(0.081)	(0.089)	(0.102)
Male FR	0.484	0.688**	0.437	1.085**	0.354	1.032**	0.780
	(0.306)	(0.240)	(0.358)	(0.355)	(0.368)	(0.392)	(0.418)
Age 26-30	-0.022	-0.200	0.249	-0.442	-0.271	-0.290	0.105
	(0.370)	(0.448)	(0.559)	(0.613)	(0.623)	(0.648)	(0.661)
Age 31-35	0.564	0.095	1.418*	-0.541	0.102	-0.224	0.771
	(0.374)	(0.439)	(0.625)	(0.624)	(0.649)	(0.674)	(0.759)
Age 36-40		0.356	0.474	-0.378	-0.485	0.409	0.862
		(0.437)	(0.564)	(0.630)	(0.616)	(0.674)	(0.682)
Age 41-45		0.522	1.379*	0.222	0.064	1.093	1.936*
		(0.466)	(0.633)	(0.694)	(0.688)	(0.744)	(0.803)
Age 46-50		0.528	1.639*	0.209	-0.060	-0.055	0.570
		(0.507)	(0.714)	(0.708)	(0.727)	(0.745)	(0.794)
Age 51-55		1.295	1.158	1.136	1.352	1.360	2.200
		(0.693)	(0.809)	(0.959)	(1.036)	(1.008)	(1.166)
Age 56-60		2.131**	5.058***	1.313	1.498	1.984	2.735*
		(0.733)	(1.431)	(1.132)	(1.191)	(1.257)	(1.375)
Age 61-65		0.826	2.950	2.493	-0.346	-0.223	2.155
		(0.770)	(1.522)	(1.376)	(0.986)	(1.272)	(1.681)
Age 66-70		2.335	1.596	1.130	4.736	-0.342	2.185
		(1.701)	(1.387)	(2.072)	(2.470)	(1.186)	(1.642)
Age 71-75		-0.933	3.818	1.064	0.287	3.415	-2.127
		(1.475)	(3.242)	(2.310)	(2.316)	(2.806)	(1.884)
Age 76+		0.406	1.788	0.804	1.231	0.819	1.110
		(1.033)	(1.352)	(1.341)	(1.281)	(1.564)	(1.180)
Inc_10-15K	0.702	0.064	2.458*	-0.122	0.323	0.024	1.632
	(0.947)	(0.857)	(1.127)	(0.963)	(1.010)	(1.122)	(1.548)
Inc_15-20K	0.133	0.187	1.985**	0.650	0.650	0.276	0.652
	(0.648)	(0.555)	ÿ0.665)	(0.673)	(0.693)	(0.819)	(0.829)
Inc_25-30K	0.105	0.489	1.530*	0.367	0.586	0.402	-0.724
	(0.630)	(0.546)	(0.623)	(0.656)	(0.669)	(0.811)	(0.773)
Inc_30-35K	0.748	0.743	1.631**	0.616	1.115	0.163	0.953
	(0.648)	(0.562)	(0.628)	(0.676)	(0.700)	(0.802)	(0.826)
Inc_35-40K	0.936	0.804	1.743**	1.166	1.354	0.157	1.167
	(0.647)	(0.560)	(0.659)	(0.692)	(0.724)	(0.820)	(0.852)
Inc_40-50K	1.655*	1.244*	2.646***	1.909*	1.578*	0.313	0.775
	(0.728)	(0.623)	(0.765)	(0.837)	(0.779)	(0.917)	(0.924)
Inc_50-60K	2.751***	2.844***	4.393***	3.026***	2.646***	2.363**	1.884*
	(0.770)	(0.609)	(0.722)	(0.742)	(0.755)	(0.895)	(0.862)
Inc_60-75K	4.464***	5.193***	7.090***	2.914***	6.368***	3.693**	4.835***
	(1.107)	(0.727)	(1.035)	(0.884)	(1.100)	(1.158)	(1.250)
Inc_75K+	5.519**	5.770***	11.984***	7.141***	6.826***	3.960*	5.877**
	(1.949)	(1.139)	(2.173)	(1.645)	(1.806)	(1.580)	(1.878)
Appeals	-11.115**	-14.135***	-13.991***	-14.447***	-11.815***	-16.004***	-12.217*
	(4.257)	(3.262)	(3.908)	(2.962)	(3.567)	(3.928)	(6.067)
Memorials	-5.862	-5.545*	-8.162*	-7.595**	-5.573	-8.899*	-8.412*
	(4.059)	(2.729)	(3.647)	(2.933)	(3.276)	(3.718)	(3.841)
Cycling	-9.240*	-10.614***	-11.851***	-10.760***	-10.138**	-11.969**	-14.233***
	(4.041)	(2.695)	(3.574)	(2.873)	(3.199)	(3.675)	(3.749)
Parachuting	-9.818*	-11.176***	-12.557***	-9.449**	-8.405*	-12.252**	-13.222**
	(4.124)	(2.766)	(3.786)	(3.137)	(3.573)	(3.910)	(4.042)
Running	-9.130*	-10.286***	-12.819***	-10.429***	-10.265**	-12.738***	-13.243***
	(4.012)	(2.688)	(3.539)	(2.844)	(3.161)	(3.637)	(3.732)
Swimming	-8.784*	-9.935***	-13.578***	-9.161**	-8.353*	-13.058***	-13.289***
	(4.131)	(2.771)	(3.672)	(3.080)	(3.456)	(3.846)	(3.861)
Walking	-10.558**	-11.826***	-14.694***	-11.930***	-11.569***	-13.950***	-13.974***
	(4.038)	(2.691)	(3.538)	(2.853)	(3.170)	(3.641)	(3.756)
Triathlon	-6.610	-8.256**	-10.925**	-7.994*	-6.226	-11.306**	-12.506**
	(4.151)	(2.833)	(3.863)	(3.323)	(3.708)	(3.928)	(3.952)
Other	-9.324*	-10.321***	-12.732***	-10.904***	-10.331**	-12.584***	-12.581***
	(4.025)	(2.694)	(3.554)	(2.855)	(3.174)	(3.643)	(3.740)
Med charity	-0.327	-0.247	-0.160	-0.144	0.144	-0.335	-0.380
	(0.621)	(0.496)	(0.740)	(0.717)	(0.723)	(0.778)	(0.884)
Lge charity	-0.471	-0.521	-0.337	0.379	0.560	-0.020	-0.068
	(0.549)	(0.444)	(0.691)	(0.684)	(0.698)	(0.751)	(0.864)
Major char	-0.055	-0.481	-0.554	-0.437	0.544	-0.355	0.054
	(0.575)	(0.444)	(0.707)	(0.691)	(0.715)	(0.753)	(0.873)
DK size	0.402	-0.396	-0.149	0.184	0.300	0.213	-0.015
	(0.546)	(0.425)	(0.690)	(0.675)	(0.674)	(0.734)	(0.830)
Overseas	5.626***	3.942***	3.827*	5.098***	4.746**	4.192*	4.659*
	(1.410)	(1.160)	(1.847)	(1.325)	(1.725)	(2.018)	(2.130)
Female	-3.713***	-4.236***	-3.391***	-3.635***	-4.067***	-4.115***	-4.360***
	(0.216)	(0.175)	(0.399)	(0.393)	(0.418)	(0.446)	(0.497)
Anonymous	-6.289***	-5.722***	-4.290***	-5.594***	-5.178***	-5.265***	-5.639***
	(0.353)	(0.303)	(0.580)	(0.584)	(0.717)	(0.769)	(0.913)
Unknown	0.166	0.184	-0.133	-0.068	-0.546	-0.711	-1.511*
	(0.285)	(0.213)	(0.554)	(0.548)	(0.560)	(0.568)	(0.600)
Constant	24.798***	29.867***	33.205***	28.623**	28.117***	29.966***	22.788***
	(4.484)	(4.677)	(8.585)	(10.367)	(5.588)	(5.032)	(6.367)
N	47,283	89,644	10,330	9,049	8,023	7,117	6,425

Standard errors, clustered at the page level, in parentheses. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

All regressions include year and month dummies. For variable definitions, see Table 2.