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Social media charity campaigns and pro-social behavior. Evidence from the Ice Bucket Challenge

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Abstract

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Social media charity campaigns and pro-social behavior. Evidence from the Ice Bucket Challenge*

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Abstract

Social media play a relevant role in shaping social attitudes and economic behaviors of individuals. One of the first very well-known examples of social media campaign is the *Ice Bucket Challenge* (IBC), a charity campaign that went viral on social networks in August 2014 aiming at collecting money for the research on amyotrophic lateral sclerosis (ALS). We rely on UK longitudinal data to investigate the causal impact of the *Ice Bucket Challenge* on pro-social behaviors. In detail, this study shows that having been exposed to the IBC increases the probability of donating money, and it increases the amount of donating money among those who donate at most £100. We also find that exposure to the IBC has increased the probability of volunteering and the level of interpersonal trust. However, all these results, but the one on the intensive margins of donations, have a short duration, limited to less than one year, supporting the prevalent consensus that social media campaigns may have only short-term effects.

Keywords: Donations, Volunteering, Altruism, Social media campaigns, Ice bucket challenge

JEL Codes: D64: Altruism, Philanthropy, Inter-generational Transfers – O35: Social Innovation

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1 Introduction

Research shows that social media have several impacts on social activities, such as the development of collective actions (Enikolopov et al., 2020a), the expansion of social movements (Levy and Mattsson, 2020), and the strengthening of anti-minority sentiments (Müller and Schwarz, 2020), to name a few. In last years, social media have also been used to encourage pro-social behaviors through the launch of awareness or charity campaigns worldwide (Van der Linden, 2017; Adena and Huck, 2020; Perroni et al., 2022). One such example is the *Ice Bucket Challenge* (IBC), which consisted in posting a video where individuals poured iced water over themselves and challenged other individuals to do the same and to donate to the amyotrophic lateral sclerosis (ALS) association. The *Ice Bucket Challenge* went viral during the summer of 2014, saw the participation of many celebrities, and collected millions of dollars worldwide to sustain the research on the ALS (Vaidya, 2014; Sohn, 2017).

Albeit social media might trigger key determinants of pro-social behavior such as peer pressure and social image concerns (Enikolopov et al., 2020b; Bénabou and Tirole, 2006), the determinants and the consequences of social media charity campaigns are still debated and largely unknown (Lacetera, 2016; Lacetera et al., 2016; Van der Linden, 2017). New research shows that online fundraising through social media (Facebook) increase donations (Adena and Hager, 2022). However, the effects of the social media charity campaigns on other forms of prosocial behaviors received little attention. In this paper, we try to fill this gap by investigating the effects that *Ice Bucket Challenge* has had on charitable giving, volunteering, and interpersonal trust and by discussing the duration of such effects.

To identify the effect of the IBC we draw on panel data from the UK Household Longitudinal Study (UK-HLS). Since we cannot observe individuals who actually participated in the social media charity campaign, we use an intention-to-treat approach, defining as treated those individuals with a social network account in the relevant period. We then exploit the interactions between this variable and a set of time dummy variables to conduct a study event. We include a broad set of controls to rule out the potentially confounding effect of marital status, age, personal income, education, job status, household size, and region of residence. Most importantly, our data allow us to control for individual fixed effects, so that we get rid of any time-invariant unobservable characteristic that might influence our results, such as altruism, risk aversion, personality traits, and moral values.

Our results suggest that the IBC increased the probability of donating money to charities, while it affected the amount of donations only among those who donate at most £100. We also find that

the IBC increased the probability of participating in volunteering activities and interpersonal trust. The empirical findings suggest that these are mostly short-term effects, that expire in less than a year.

Our contribution sheds light on interesting mechanisms behind charitable giving behavior through social media campaigns. Economic literature investigates the relationship between time and money donations, finding a positive correlation between the two (Bauer et al., 2013; Feldman, 2010; Cappellari et al., 2011). We contribute to this debate by showing that social media charity campaigns might increase time donations in addition to charity donations. We also show that social media campaigns increase interpersonal trust, contributing to the ongoing debate on the relationship between social media usage and interpersonal trust (Antoci et al., 2019; Geraci et al., 2022).

2 The Ice Bucket Challenge in the UK

The IBC began in the US in July 2014, it soon spread around the globe and it went particularly viral in the United Kingdom, Ireland, and Canada. Figure 1 shows the intensity of the Google searches for ‘Ice Bucket Challenge’ in 2014 worldwide and it appears that the intensity of searches in the UK, Canada, and Ireland was even higher than in the US.

The great interest in the IBC in the UK led to a significant increase in donation intentions. According to Google trends, the impressive increase in searches for ‘Ice Bucket Challenge’ in August 2014 goes hand in hand with words related to money donation, such as ‘donation’, ‘how to donate to charity’, and ‘how to donate’. Figure 2 shows the searches of these words from January 2004 to August 2021 and a clear spike in August 2014 can be observed for all terms. Interestingly, the intensity of searches for ‘donation’ and ‘how to donate’ in August 2014 is even higher than that in March 2020, when the COVID-19 pandemic broke out, fostering a wave of solidarity toward categories most harshly hit by its economic consequences. This qualitative evidence is of particular interest if read in light of the literature showing that online salience is predictive of real donation behavior (Perroni et al., 2022).

Albeit research suggests that only a small fraction of those who interact with charity campaigns on the social media donate money (Lacetera et al., 2016), the Motor Neuron Disease Association (MND), which is the association nominated in the IBC in the UK, received more than 750,000 donations, collecting more than £6 million in August 2014 only.¹

According to the survey run by the Charities Aid Foundation in 2014, 30% of young and 17%

¹The full statement can be found at this link: <https://bit.ly/3ArhBJX>.

of the total population, that is about 10 million people, participated to the IBC and one over ten people donated money, resulting in an estimated total amount of donations worth of £10 million (CAF, 2015). Overall, thanks to its diffusion, the involvement of celebrities, and the peer pressure exerted, the IBC is deemed as the most successful fundraising social media campaign (Vaidya, 2014)² However, it is interesting to notice that all the informative, descriptive, reports focus on the short-term effects of IBC on money donation, without questioning its potential effects in the long run and its impact on other pro-social behaviors.

In the following sections, we investigate the possible impact that the IBC had on volunteering and interpersonal trust in addition to the impact on donation behavior.

3 Data and empirical strategy

In this section, we describe the data and the empirical strategy employed to study the effect of the IBC on pro-social behavior.

3.1 Data, main variables and summary statistics

The survey We use data from the United Kingdom Household Longitudinal Study (UK-HLS), a survey representative of the UK population. The UK-HLS, also known as *Understanding Society*, started in 2009 and interviews around 40,000 households per wave, each wave covering two or three years (see Table A2). The UK-HLS interviews each member of the household older than 16 and collects several information, such as labor force participation, educational level, attitudes, and political orientation, to name a few. Concerning our variables of interest, information on donation behavior and volunteering activities are collected in waves 2, 4, 6, and 8, while information on interpersonal trust is collected in waves 3 and 6. Finally, information on the use of social networks is collected in waves 3, 6, and 9.

Social networks Since we cannot observe whether individuals in our sample actively participated in the IBC, we follow an intention-to-treat approach. We assume that individuals with a social network account have been exposed to the IBC, while those not belonging to a social network account have not been exposed to the IBC. Hence, our main treatment variable is built around a question asking whether an individual belongs to a social networking website (SNS) or not. The treatment variable takes a value equal to 1 for everyone who declared to belong to a SNS in wave 6 (that mainly refers to the year 2014) and 0 otherwise. As a robustness check,

²<https://fundraising.co.uk/2019/03/06/why-did-the-ice-bucket-challenge-do-so-well/>.

we use as a treatment the same variable, considering as treated those individuals with a social network account both in wave 3 (mainly referring to the year 2011) and in wave 6, in order to rule out the possible selection bias of individuals who registered to a social network *because of* the IBC.

Donation behavior The main outcome of interest is whether individuals change their behavior on money donation when exposed to the IBC. The relevant question in the survey is the following: *In the last 12 months, have you donated any money to charities or other organizations?* From answers to this question we create a dummy variable taking a value equal to 1 for those who declare to have donated and 0 otherwise. Those who declare to have donated money are also asked: *Approximately how much money in total have you given to charities or other organizations in the last 12 months?* We use answers to this question to evaluate the possible impact that the IBC had on the intensive margin of donations, i.e. on the amount that people actually devolved.

Volunteering To measure involvement in volunteering activities we use answers to the following question: *In the last 12 months, have you given any unpaid help or worked as a volunteer for any type of local, national or international organization or charity?* From this question we create a dummy variable that equals 1 if the respondent declares to have done volunteering and 0 otherwise.

Interpersonal trust The survey asks individuals if they agree with a series of statements on a scale from 1 to 5. We use answers to the following statement: *People in this neighborhood can be trusted.* We proxy interpersonal trust with answers to this statement and generate a 5-point Likert scale variable where 1 corresponds to ‘strongly disagree’ and 5 to ‘strongly agree’.

Descriptive Statistics The descriptive statistics of our sample can be found in Table 1. After the data cleaning process, our sample is composed of 30,409 individuals, each one interviewed on average 3.3 times, for a total of 100,071 observations. On average, individuals in our sample are 49 years old, and the 56% of the sample consists of females. About 72% of the sample declares to have donated money, while those who are involved in volunteering activities are the 20%. Around the 56% of individuals in the sample have a social network account.

3.2 Empirical strategy

In order to test whether the IBC had a causal impact on the outcomes described above, we implement an event study estimation strategy using an intention-to-treat (ITT) approach. In a nutshell, we test whether individuals belonging to either of the two groups (*potentially* exposed to the IBC or not, as defined in the previous section) experience different outcomes during and right after the IBC in the summer of 2014. Such methodology relies on the assumption that there are parallel trends between the two groups, i.e.: pro-social behaviors differ among the two groups *only* because of the potential exposure to the IBC. The baseline model is as follows:

$$Y_{irt} = \alpha + \beta (T_t \times E_{ir14}) + \gamma X_{irt} + T_t + \eta_r + \theta_i + \varepsilon_{irt} \quad (1)$$

where Y_{irt} is the outcome of interest for individual i living in region r and interviewed at time t . Such outcome depends on whether or not the individual is potentially exposed to IBC in wave 6 (the treatment variable E_{ir14}) interacted to a set of dummy variables identifying the year of the interview (T_t), and on a set of individual time-varying characteristics (X_{irt}) which include age, income, marital status, education, job status, number of children in the household. Finally, T_t , η_r and θ_i are time, region and individual fixed effects, respectively, and ε_{irt} the usual idiosyncratic error term. Since the question on money donation refers to the ‘last 12 months’, individuals exposed to IBC starting from July 2014 report money donations in the ‘last 12 months’ from July 2014 to June 2015. For this reason, we define time t not according to calendar year, but as the 12 months period from July of each year to June of the next year.³

The identification strategy relies on the comparison over time among single individuals belonging to two groups: those who are *potentially* exposed to the IBC and those who are not. The outcomes of these two groups should not be statistically different from each other (when conditional on some controls) before summer 2014, while are expected to show different values in 2014 and possibly in the next periods, depending on the duration of the effect of IBC. Thanks to the panel nature of our data, we are able to rule out any time-invariant characteristics possibly related to money donation and volunteering. The richness of information also allows us to control for a wide set of time-varying characteristics that might affect the propensity to donate time or money, such as income, occupational status and the number of young children.

The ITT nature of our approach is based on the fact that we do not know whether each individual actively participated to the IBC, but we only know whether they had a social network account in wave 6. As such, the ITT leads to under-estimation of results, since not all individuals classified

³Since the number of individuals and observation changes over time (see Appendix B for more details), we choose 2010/2011 or 2011/2012 as the baseline period, depending on the dependent variable.

as treated had actually participated in the IBC. The results presented in the next section should be then interpreted as a lower bound.

Finally, for the sake of simplicity, we treat all dependent variables as continuous, interpreting as linear probability models the models with donation and volunteering as dependent variables.

4 Results and Discussion

The following paragraphs discuss the results of the regression models, described in the previous section and displayed in Table 2 and Figure 3, in the light of the most recent literature. All the reported results remain virtually unchanged when using the alternative, more restrictive treatment that considers potentially exposed to IBC only individuals with a social network account both in wave 6 and in wave 3 (Table A1). This finding supports the lack of reverse causality from IBC to the creation of a social network profile, but rely on a significantly smaller sample size.

Probability of donating The primary result is that individuals potentially exposed to IBC seem to have a significantly larger probability of donating money in the period July 2014-June 2015 with respect to the control group. Specifically, the (potential) exposure to the IBC increased donations by 3 percentage points ($p < 0.01$), corresponding to the 4.2% of the mean. A back-of-the-envelope calculation leads to the result that about 1.600 people decided to donate because of the IBC in our sample and about 1 million individuals in the UK.⁴

Such results might be interpreted along with the massive descriptive evidence that charities associations reported. According to the Charities Aid Foundation (CAF, 2015), one over six people have participated in the IBC, and one over ten people donated money, resulting in an estimated total amount of donations worth £10 million. Our results inform this descriptive evidence since, to the best of our knowledge, this is the first attempt to estimate a causal effect of the IBC on charitable giving.

Furthermore, the link between the IBC and the increase in donations can be understood in light of the literature on social media. Some aspects of social media might easily encourage charitable giving. As an example, Enikolopov et al. (2020b) show that social media boost peer pressure, which is a key determinant of charitable giving. Smith et al. (2015) show with an online fundraising campaign that people’s decision to donate is influenced by the amount donated by

⁴We compute such effect as the 3% of the treated sample/population, that is about 55% of the total sample/population.

their peers. Meer (2011) finds that individuals are more willing to donate and to donate more if they are asked to give from a person belonging to their social ties. These elements were all present in the IBC since people had to be nominated on social networks to perform the challenge, and the amount of donation was usually fixed at £5.

Amount of donation When investigating the extensive margin, we find no significant effects. Column 2 of Table 2 shows no effects of the IBC on the amount of donation among the subsample of individuals who actually made a donation. However, results in Column 3 of Table 2 suggest that if we restrict our sample to those who donate at most £100, we find an increase in the amount of donations of around £2.5⁵. Interestingly, this effect persists also in subsequent years. This might suggest that those who donate at most £100 per year decided to keep donating to the MNDA or to similar social media charity campaigns.

Volunteering As for volunteering, we also find a significant effect of the IBC on volunteering activities: the exposure to the IBC increased the probability of undertake volunteering activities by 2.7 percentage points ($p < 0.01$), corresponding to the 13% of the mean. The back of the envelope calculation suggests that the IBC pushed about 0.9 million people to join volunteering activities.

These results might be read in light of the literature suggesting a positive and significant correlation between time and money donations. Using US survey data, Feldman (2010) finds that a tax deduction on money donations, increases both time and money donations. Such an effect is possibly driven by several mechanisms through which an increase in money donations leads to an increase in time donations, e.g. when people increase money donations their information on charitable activities increases, and the acquisition of additional information might push people to get involved also in volunteering activities. Bauer et al. (2013) finds a strong positive correlation between time and money giving across European countries. However, such correlation is not homogeneous and varies across countries and type of charitable organizations, with religious organizations and states with lower levels of social spending showing the strongest correlation between time and money donations. Cappellari et al. (2011) finds a complementarity between time and money donations in Italy, showing an interesting gender differences with males more likely to react to the “opportunity cost” of giving than females. In other words, when choosing to donate, males are sensitive to leisure and work without distinguishing between paid or unpaid work. Given this strong evidence, it is plausible that such complementarity took place also in

⁵The plot of the coefficients can be found in Figure A2.

the IBC.

Interpersonal trust Finally, we find that the IBC has increased individuals' interpersonal trust by 0.04 units ($p < 0.01$), corresponding to 1% of the mean. This effect relates to the growing literature on the effects of social media on social capital and trust. The effects of social media on social (offline) behavior it is still under investigation, and the literature has underlined both the positive and negative effects of social media on people's behavior. Allcott et al. (2020) show through a field experiment that social media deactivation increases life satisfaction, decreases political polarization, and increases offline socialization. Enikolopov et al. (2020b) finds that social media boost the participation to collective actions, such as political protests, and find no effects on political polarization. Studies using UK data find that internet penetration has decreased voter turnout – this result is especially true for low-educated voters – as well as civic and political engagement (Gavazza et al., 2019; Geraci et al., 2022). More specifically, recent studies show that sentiments in social media affect real-life behavior. Müller and Schwarz (2020) find that the spread of tweets related to anti-minority sentiments leads to an increase of hate crimes against minorities. Antoci et al. (2019) show through an experiment that when individuals are exposed to a civil environment in social media their level of interpersonal trust increases. A suggestive explanation of our result⁶ on the IBC leading to higher levels of interpersonal trust is that the IBC has had a positive effect on the prevailing sentiment in the social media environment. It may be that the growing interest in social issues slightly modified the environment in social media. As an example, Facebook introduced the possibility of launching individual charity campaigns on the occasion of one's birthday in 2015, shortly after the IBC. Figure A3 shows that in August 2014 Google searchers for 'Facebook Donate' and 'How Donate Facebook' spiked. This qualitative evidence might suggest that social media (Facebook in this case) during August 2014 have been widely used also to spread one's donation. Consequently, the exposure to positive content might have increased the levels of interpersonal trust.

As a final remark, it must be highlighted that the duration of the effects seems to be limited, since none of the coefficients remains statistically different from 0 after the period July 2014-June 2015. The only exception is represented by the sample of people who donate at most £100 a year. Overall, the short duration of our effect is consistent with the rather scant literature that have investigated the duration of the effect of such social media campaigns, among which Adena and Hager (2022).

⁶Unfortunately, this mechanism is only speculative, since it is not possible to test this channel with the data at hand, and we are not aware of other data that may help investigating this mechanism in our framework.

5 Conclusion

This paper investigates the effects of a social media charity campaign on pro-social behavior. We rely on the exceptional diffusion of the IBC to understand the possible impact of such campaigns on pro-social behavior.

The literature on the effects of social media is growing rapidly and does not always agree on the effects of social media on people’s behavior. This lack of agreement is due both to the fact that the advent of social media is relatively new, and that social media themselves might have contrasting effects when it comes to aspects related to pro-social behavior or social capital (Enikolopov et al., 2020b; Geraci et al., 2022; Allcott et al., 2020; Bauernschuster et al., 2014). Our results help to shed light on a specific activity carried out on social media, that is charitable giving campaigns.

Using an ITT approach, we find an overall positive effect of the IBC on pro-social attitudes. Specifically, we find that the IBC increased the number of people willing to donate to a charity. It also increased the probability of joining volunteering activities, and the level of interpersonal trust. However, the IBC appears to have only a short-term effect on pro-social behavior.

In general, our results suggest that social media charity campaigns might have positive effects on pro-social behavior.

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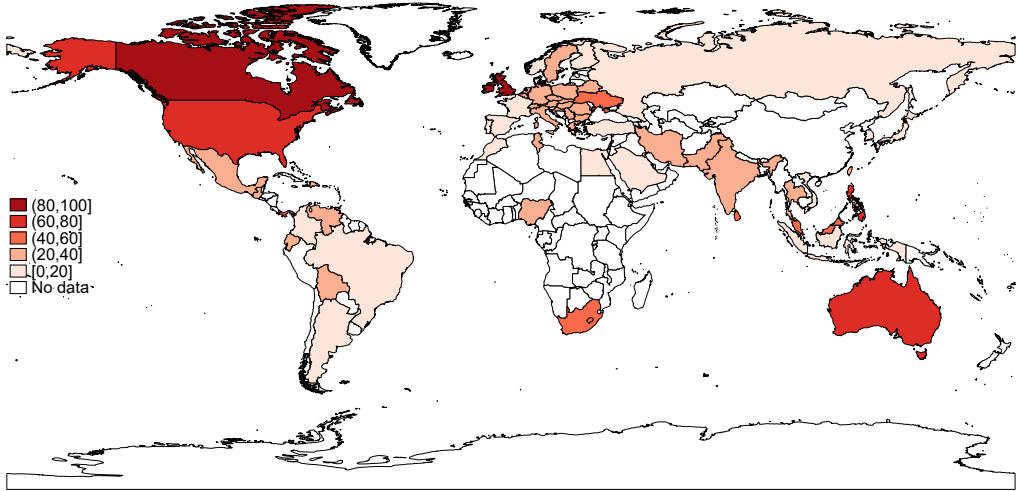
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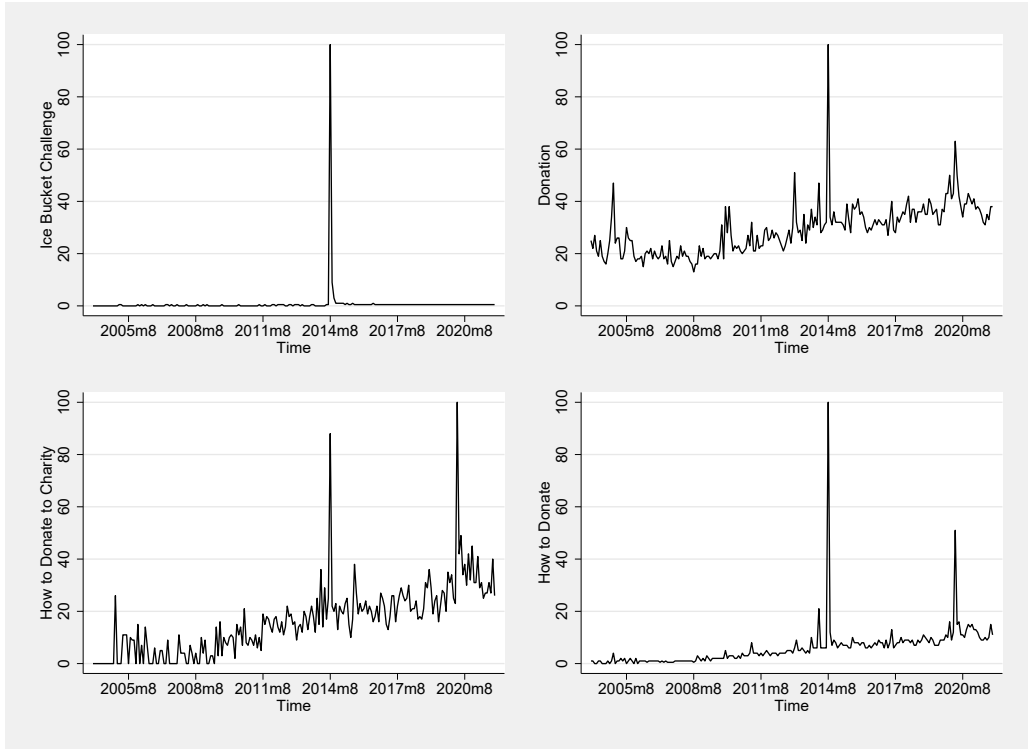
Tables and Figures

Figure 1: Google searches for Ice Bucket Challenge



Notes: The figure shows the relative searches, standardized by State from 0 to 100, for 'Ice Bucket Challenge' in 2014.

Figure 2: Google searches for Ice Bucket Challenge and money donations

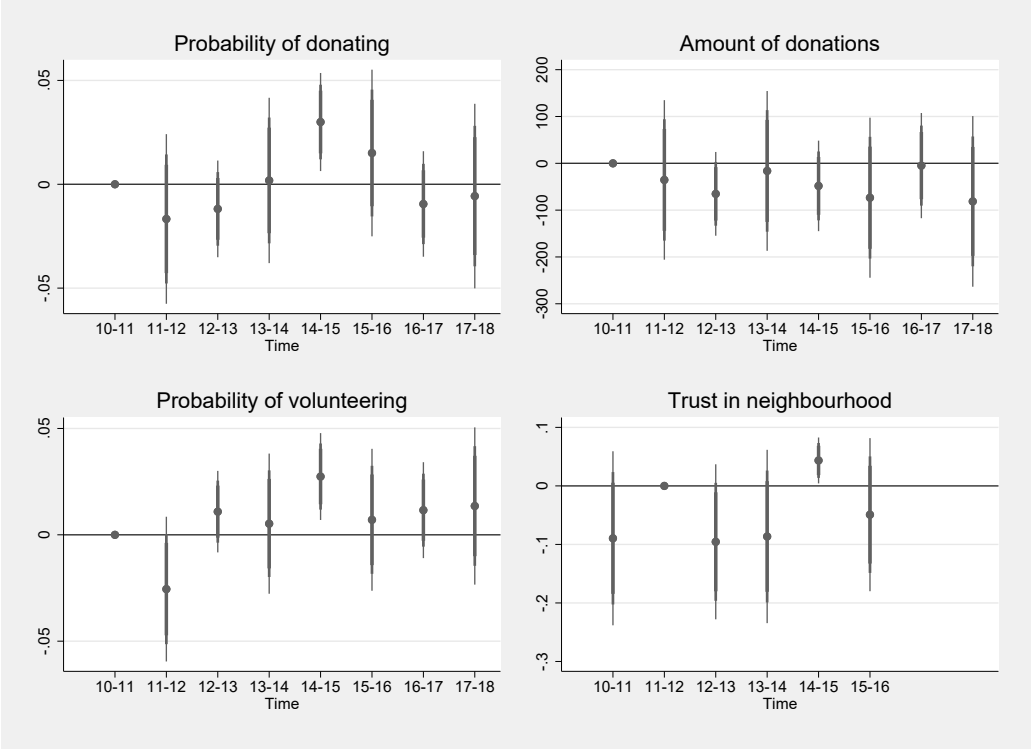


Notes: The figure shows the monthly relative searches, standardized over time from 0 to 100, in the United Kingdom since 2004.

Table 1: Summary statistics

Variable	Mean	Std. Dev.	Min.	Max.	N
Female	0.561	0.496	0	1	100063
Age	48.68	17.846	16	102	100063
Monthly Income (gross)	1763.138	1580.683	0	27472.699	100063
Married	0.539	0.498	0	1	100063
University Degree	0.256	0.437	0	1	100063
Employed	0.489	0.5	0	1	100063
Unemployed	0.044	0.206	0	1	100063
Number of Children	0.734	1.077	0	12	100063
SNS Belonging	0.557	0.497	0	1	100063
Amount Donated to Charity	222.081	563.714	1	9999	66520
Charity	0.717	0.45	0	1	100063
Volunteering	0.206	0.405	0	1	100063
Trust in Neighbours	3.71	0.796	1	5	49030

Figure 3: Main results. Effects of having a social network account in wave 6 on outcomes of interest.



Notes: dots represent the point estimations; line thickness represents 99%, 95% and 90% confidence intervals, respectively. The baseline period is July 2010-June 2011 or July 2011-June 2012.

Table 2: Main results.

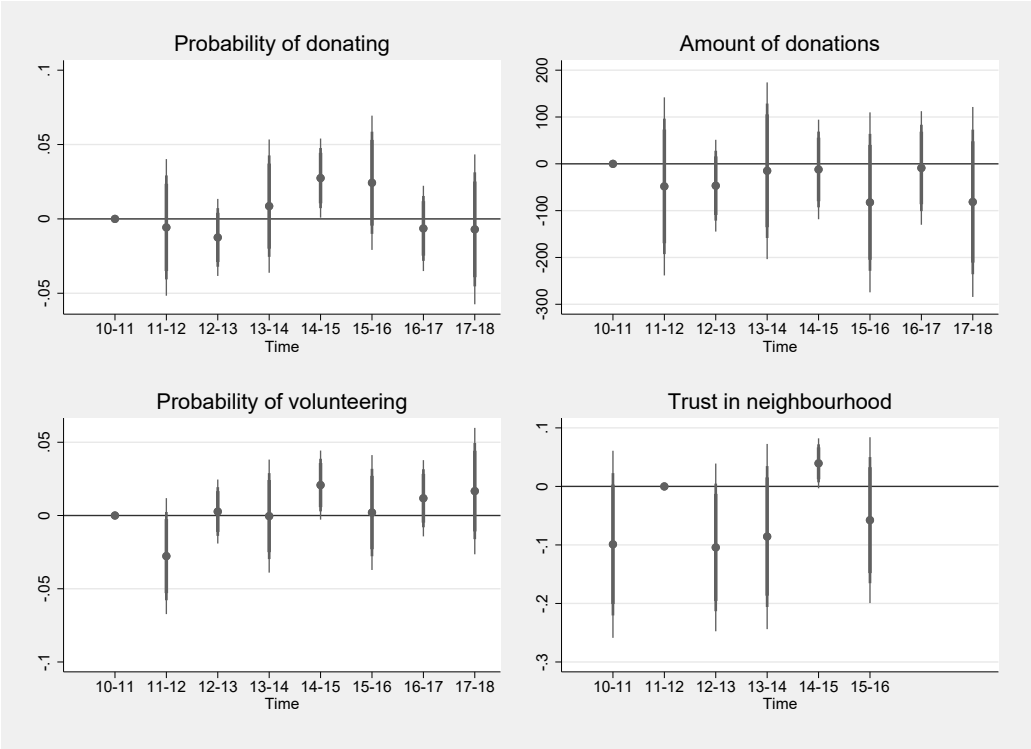
	Money donation	Amount donated	Amount (\leq £100) donated	Volunteering	Trust in neighbours
2010-2011 \times Treated	.	.	.	.	-0.090 (0.058)
2011-2012 \times Treated	-0.017 (0.016)	-20.486 (23.248)	0.317 (2.157)	-0.026* (0.013)	.
2012-2013 \times Treated	-0.012 (0.009)	-23.568** (11.288)	0.049 (1.105)	0.011 (0.007)	-0.096* (0.051)
2013-2014 \times Treated	0.002 (0.015)	-9.605 (23.068)	-0.028 (2.108)	0.005 (0.013)	-0.086 (0.057)
2014-2015 \times Treated	0.030*** (0.009)	-17.290 (11.811)	2.478** (1.151)	0.027*** (0.008)	0.044*** (0.015)
2015-2016 \times Treated	0.015 (0.016)	-31.310 (23.163)	2.198 (2.135)	0.007 (0.013)	-0.049 (0.051)
2016-2017 \times Treated	-0.009 (0.010)	-9.935 (14.576)	3.647*** (1.320)	0.012 (0.009)	.
2017-2018 \times Treated	-0.006 (0.017)	-38.113 (25.900)	2.586 (2.361)	0.014 (0.014)	.
Individual controls	Yes	Yes	Yes	Yes	Yes
Regional fixed effects	Yes	Yes	Yes	Yes	Yes
Observations	100063	66520	41556	100063	49030
Individuals	30401	26216	21105	30401	24515

Notes: *** p -value < 0.01 , ** p -value < 0.05 , * p -value < 0.10 . Treatment: having a social network account in wave 6. Standard errors clustered at individual level are reported in parentheses.

Appendices

Appendix A

Figure A1: Robustness check. Effects of having a social network account in wave 6 and in wave 3 on outcomes of interest.



Notes: dots represent the point estimations; line thickness represents 99%, 95% and 90% confidence intervals, respectively. The baseline period is July 2010-June 2011 or July 2011-June 2012.

Table A1: Robustness check.

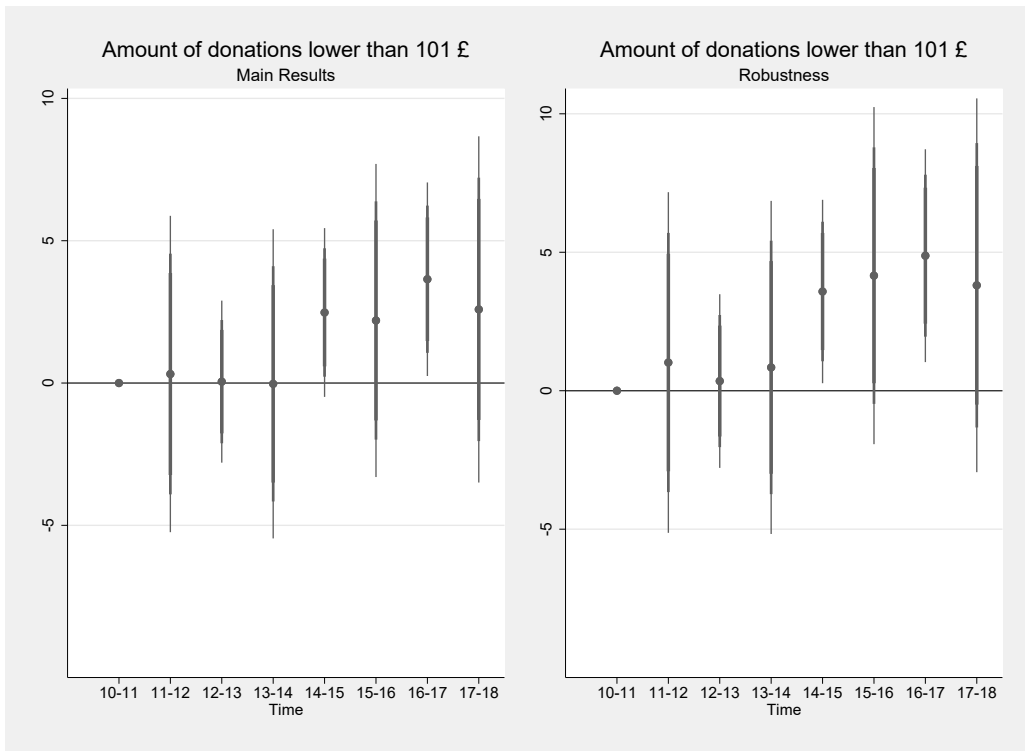
	Money donation	Amount donated	Amount (\leq £100) donated	Volunteering	Trust in neighbours
2010-2011 \times Treated	.	.	.	.	-0.099 (0.062)
2011-2012 \times Treated	-0.006 (0.018)	-31.808 (26.176)	1.019 (2.387)	-0.028* (0.015)	.
2012-2013 \times Treated	-0.012 (0.010)	-17.383 (12.261)	0.349 (1.217)	0.003 (0.008)	-0.104* (0.056)
2013-2014 \times Treated	0.009 (0.017)	-11.123 (25.833)	0.841 (2.335)	-0.000 (0.015)	-0.086 (0.061)
2014-2015 \times Treated	0.027*** (0.010)	-4.836 (13.021)	3.582*** (1.285)	0.021** (0.009)	0.039** (0.017)
2015-2016 \times Treated	0.024 (0.018)	-35.686 (26.237)	4.156* (2.363)	0.002 (0.015)	-0.058 (0.055)
2016-2017 \times Treated	-0.006 (0.011)	-12.860 (15.640)	4.876*** (1.492)	0.012 (0.010)	.
2017-2018 \times Treated	-0.007 (0.020)	-44.705 (29.527)	3.807 (2.620)	0.017 (0.017)	.
Individual controls	Yes	Yes	Yes	Yes	Yes
Regional fixed effects	Yes	Yes	Yes	Yes	Yes
Observations	74618	50850	31483	74618	41306
Individuals	21875	19307	15475	21875	20653

Notes: *** p -value < 0.01 , ** p -value < 0.05 , * p -value < 0.10 . Treatment: having a social network account in wave 6 and in wave 3. Standard errors clustered at individual level.

Table A2: Distribution of sample by waves and years

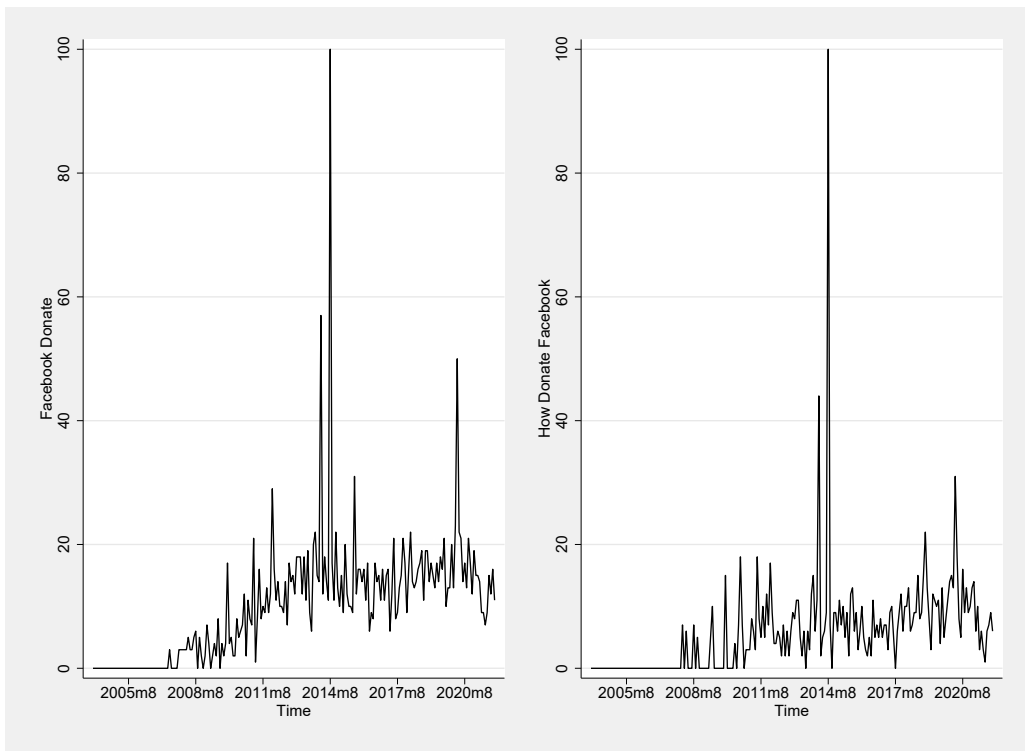
Year	Wave 2	Wave 4	Wave 6	Wave 8	Total
2010	6,106	0	0	0	6,106
2011	11,461	0	0	0	11,461
2012	494	13,849	0	0	14,343
2013	0	12,042	0	0	12,042
2014	0	1,007	15,609	0	16,616
2015	0	0	13,540	0	13,540
2016	0	0	1,054	13,127	14,181
2017	0	0	0	10,699	10,699
2018	0	0	0	1,083	1,083
Total	18,061	26,898	30,203	24,909	100,071

Figure A2: Amount donate ≤ 100 pounds



Notes: dots represent the point estimations; line thickness represents 99%, 95% and 90% confidence intervals, respectively. The baseline period is July 2010-June 2011.

Figure A3: Google searches for Donations through Facebook



Notes: The figure shows the monthly relative searches, standardized over time from 0 to 100, in the United Kingdom since 2004.

Appendix B

Our main results concerning charitable donations and volunteering display large confidence intervals in even time periods (Figure 3, panels a, b, c), while our main results concerning trust (panel d) display large confidence intervals in almost all the time periods except for the time period 2014-2015. This is due to the structure of the sample: since the main dependent variables are asked every two (or three) waves, the number of individuals surveyed differs in each time period. Specifically, the number of individuals who are interviewed in all the waves that we use is unbalanced over time, as shown in Tables B1 and B2. As a consequence, the standard errors and confidence intervals are larger by construction in odd years.

Table B1: Duplicates of individual

Obs.	Individuals	Number of duplicates
10,194	5,097	2
34,041	11,347	3
55,828	13, 957	4
Total	100,063	30,401

Table B2: Distribution of individuals which are in all waves. Dependent variable: Charitable giving, Amount of charity given, Volunteering)

Time Period	Wave				Total
	2	4	6	8	
2010-2011	9,375	.	.	.	9,375
<i>Percentage</i>	<i>67.17</i>	.	.	.	<i>16.79</i>
2011-2012	4,582	260	.	.	4,842
<i>Percentage</i>	<i>32.83</i>	<i>1.86</i>	.	.	<i>8.67</i>
2012-2013	.	8,871	.	.	8,871
<i>Percentage</i>	.	<i>63.56</i>	.	.	<i>15.89</i>
2013-2014	.	4,826	309	.	5,135
<i>Percentage</i>	.	<i>34.58</i>	<i>2.21</i>	.	<i>9.20</i>
2014-2015	.	.	8,716	.	8,716
<i>Percentage</i>	.	.	<i>62.45</i>	.	<i>15.61</i>
2015-2016	.	.	4,932	337	5,269
<i>Percentage</i>	.	.	<i>35.34</i>	<i>2.41</i>	<i>9.44</i>
2016-2017	.	.	.	8,606	8,606
<i>Percentage</i>	.	.	.	<i>61.66</i>	<i>15.42</i>
2017-2018	.	.	.	5,014	5,014
<i>Percentage</i>	.	.	.	<i>35.92</i>	<i>8.98</i>
Total	13,957	13,957	13,957	13,957	55,828
<i>Percentage</i>	<i>100</i>	<i>100</i>	<i>100</i>	<i>100</i>	<i>100</i>

Table B3: Distribution of individuals which are in all waves
(Dependent Variable: Trust)

Time Period	Wave		Total
	3	6	
2010-2011	6,107	.	6,107
<i>Percentage</i>	<i>24.91</i>	.	<i>12.46</i>
2011-2012	12,199	.	12,199
<i>Percentage</i>	<i>49.76</i>	.	<i>24.88</i>
2012-2013	6,206	.	6,206
<i>Percentage</i>	<i>25.32</i>	.	<i>12.66</i>
2013-2014	3	6,031	6,034
<i>Percentage</i>	<i>0.01</i>	<i>24.60</i>	<i>12.31</i>
2014-2015	.	12,035	12,035
<i>Percentage</i>	.	<i>49.09</i>	<i>24.55</i>
2015-2016	.	6,449	6,449
<i>Percentage</i>	.	<i>26.31</i>	<i>13.15</i>
Total	24,515	24,515	49,030
<i>Percentage</i>	<i>100</i>	<i>100</i>	<i>100</i>

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