

# Donate More, Be Happier! Evidence from the Netherlands

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**Abstract** It is hypothesized that charitable donation provides psychological benefits collectively referred to as the “warm glow”. This study aimed to determine the magnitude of the “warm glow” of charitable donors based on subjective wellbeing data and real-world donation totals obtained from two surveys: the Longitudinal Internet Studies for the Social Sciences (LISS) and the Giving in the Netherlands Panel (GINP). Fixed effect estimates showed that when controlling for such major shocks to happiness as changes in marital status, income, and employment, charitable donors had higher happiness scores. To account for the endogeneity of donating, variation in the types of solicitation by charities was exploited. Some specifications from instrumental variable estimation showed that donating higher amounts of money increases life satisfaction significantly. The results show the local average treatment effect (LATE) for individuals who donate an extra Euro because they are solicited and these individuals would not donate this extra Euro if they were not solicited.

**Keywords** Warm-glow · Donation · Happiness · Solicitation

## Introduction

From an economics point of view, why people give their hard-won money for free is an interesting question. The literature has examined a number of motivations for donation, including signaling one’s social status (Glazer and Konrad 1996), enhancing one’s reputation (Harbaugh 1998), and acquiring a tax advantage (Clotfelter 1985). Some researchers report that some individuals have a taste for giving and experience a “warm glow” when they donate (Andreoni 1989, 1990).

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There are mechanisms associated with the positive psychological effects of charitable donation. Donating can reduce stress, strengthen the immune system, and improve overall health (Yoruk 2014).

When a donation is made in a large economy, the warm glow motivation must exist (Ribar and Wilhelm 2002). Because, if potential contributors do not get some private utility from donating, then they can get utility from a total supply of charity by other donors without donating themselves.

Although the warm glow hypothesis has existed since the 1980s, economic studies on the warm glow have largely been theoretical (Andreoni 1989, 1990). Empirical research shows that as governmental contributions to charity increase, private donation is only partially crowded out, which indicates that the warm glow motivation remains (Crumpler and Grossman 2008). The psychology literature on the relationship between donating behavior and subjective wellbeing is based on three viewpoints: (1) donating promotes happiness (Aknin et al. 2013; Dunn et al. 2008; Harbaugh et al. 2007; Tankersley et al. 2007; Moll et al. 2006); (2) as the level of happiness increases, the likelihood to donate increases (Wang and Graddy 2008; Rosenhan et al. 1974; Aderman 1972); and (3) donating and happiness are both caused by a third variable such as personality traits. (Sargeant et al. 2000; De Neve and Cooper 1999).

A well-known study by Dunn et al. (2008) showed that in North America, spending money on others increases happiness more than spending money on oneself. The researchers randomly assigned university students to the spend money on others group and spend money on themselves group, and the students in the former were significantly happier at the end of the study. Aknin et al. (2013) reported that based on Gallup World Poll data from about 200,000 individuals in 136 countries, there was a significant association between charitable giving and level of happiness in the majority of countries.

Understanding donor behavior is important, as charitable donations account for a substantial part of a country's economy. The total value of money and goods donated by Dutch households in 2009 was €1938 million, and 87% of Dutch households donate money to charitable organizations (Schuyt et al. 2011).

The present study aimed to determine if charitable donation increases happiness taking into account the potential for reverse causality and personality-related fixed factors. The study was based on two panel datasets from the Netherlands: five waves of the Longitudinal Internet Studies for the Social Sciences (LISS) Panel and one wave of the Giving in the Netherlands Panel (GINP).

Exploiting the longitudinal nature of the LISS Panel, random and fixed effect models were run; however, even fixed effect specification is insufficient for determining the direction of causality. To determine the direction of causality, we employed an instrumental variable (IV) approach for GINP data, taking different types of personal solicitation as instruments for donating, as the literature suggests that solicitation is an effective way to induce people to make charitable donations (Meer and Rosen 2011; Van Diepen et al. 2006; Bekkers 2005). The GINP collected data concerning whether or not the respondents were solicited for charitable donations via 13 fundraising methods during the previous 2 weeks.

In terms of a supply and demand market, if donation is considered a normal good, donors constitute the supply side of the market, whereas, charities constitute the demand side. Use of solicitation for donation as an instrument is plausible, as it

originates from the demand side of the market. Moreover, solicitation for donation exerts social pressure on prospective donors, increasing the likelihood that they will donate. Although prospective donors may want to donate, they might not be due to an information gap. For instance, a prospective donor might not know who needs help the most and how to make a donation; charities can supply such information via solicitation.

The 13 types of solicitation for donation as the present study's instrument set are jointly significant in explaining donation behavior; however, the validity of our IV results is based on the assumption that the type of solicitation does not directly affect happiness. The main drawback to using solicitation data is that charities might target some people rather than others, which might be related to their happiness in an unobserved way. Charities are known to focus their solicitation efforts on potential contributors of affluence. So, as to obtain unbiased estimates for the effect of donating, income was controlled in the regression model.

As fixed effect estimates are preferred to random effect estimates (based on Hausman test results), and liner regression results can be plagued by endogeneity, here, we report the fixed effect estimates of the LISS panel and IV estimates of the GINP. The fixed effect specification—indicative of long-term effects (as it is based on annual donation data)—suggests that engaging in donation is associated with a happiness score increase of 0.045 points on a 10-point Likert-type scale at the 1% significance level. According to some specifications from IV—indicative of short-term effects (as it is based on the previous 15 days donation data)—increasing donation by €1 increases life satisfaction by 0.012 points on a 7-point Likert-type scale at the 5% significance level.

To give you some idea about the size of the estimate which shows the effect of donating on life satisfaction, the coefficient of income and the coefficient of money donated are compared and this suggests that an increase of €1 in donations increases life satisfaction as much as a €104 increase in income from employment for those who was affected by solicitation. At first, the effect might seem implausible. However, this is the local average treatment effect (LATE) for individuals who donate an extra Euro because they are solicited and these individuals would not donate this extra Euro if they were not solicited. This group of individuals is not likely to be representative of the Dutch population; therefore, IV estimates might not be indicative of the average treatment effect, and these results cannot be generalizable to the Dutch population.

For discussing the policy implications, the average treatment effect would be more useful. Nevertheless, the present study's primary finding that donating makes some people happier could have policy implications for boosting charitable giving. That is, there could be room for increasing happiness of people who are not aware of the psychological benefits of donating by promoting donating. The evidence shows that people overlook the benefits of charitable giving. Dunn et al. (2008) reported that individuals erroneously thought that personal spending would make them happier than pro-social spending; they noted higher happiness scores among individuals randomly assigned to pro-social spending. Frank (2004) observed that people do not spend their money in ways that yield significant and lasting increases in measured life satisfaction.

The literature includes many studies on the relationship between measures of generosity other than monetary donation and happiness based on correlational analysis (see Aknin et al. 2013 for a full review). Our study contributes to the literature since we provide suggestive evidence from a longitudinal dataset using real donation amounts

and also causal evidence on the impact of donating on happiness rather than simply correlational analysis.

## Methods

To estimate the effect of donating on happiness, the relationship between happiness (or life satisfaction) was conceptualized using the following equation:

$$Y_{it} = X_{it}\beta + \alpha D_{it} + \varepsilon_{it} \quad (1)$$

Where  $Y$  is the happiness (or life satisfaction) score,  $X$  is a vector of other control variables, and  $D$  is the donating behavior variable. The treatment effect  $\alpha$  will be positive if donating increases happiness after controlling for covariates denoted by  $X$  in Eq. (1). Charitable donation by default imposes a financial cost to donors; therefore, an individual's financial status is potentially correlated with the decision to donate. To account for this possibility, employment status and net monthly income from employment are included in  $X$ . If generous people are more likely to donate, they might also be more likely to volunteer. We include indicators of volunteering in  $X$  to account for possible correlations between generosity and donating. It is possible that the coefficient of donating might indicate something about sociability of an individual rather than the effect of donating per se; therefore, being a member of a social organization and participating in an event in social organization are included in  $X$  as independent variables to account for differences in sociability.

A critical concern when estimating the impact of donating on happiness is that happiness levels might not be comparable between individuals, which would render cross-sectional analysis invalid. Another issue to consider is self-selection of individuals into being a donor. If certain personality types are more likely to donate and to report higher levels of subjective happiness, then the difference in happiness scores between donors and non-donors might be due to an unobserved personality effect. To overcome these issues, panel data could be used to observe a person's subjective wellbeing over time. Moreover, time-invariant personality factors can be accounted for by examining an individual over time. As such, fixed effect models provide an unbiased estimate of the effect of donating on happiness when the only source of endogeneity is fixed personality-related heterogeneity.

## IV Estimation

Fixed effect models can not be sufficient to identify the direction of causality if there is a concern for reverse causality. Reverse causality, in this context, implies that induced happiness makes people to donate more and this is shown to occur as mentioned above. Therefore, IV models are necessary to analyze the direction of causality. IV estimation requires instruments that exogenously change donating behavior. That is, instruments should impact an individual's decision to donate without affecting their happiness directly. Solicitation could be an instrument for donation, as some individuals are asked

to donate while others are not. To specify the relationship between donating and instruments, the following equation was used:

$$D_{it} = X_{it} \gamma + Z_i \delta + \theta_{it} \quad (2)$$

Where  $D$  is the donating behavior,  $X$  is a vector of other control variables,  $Z$  is the solicitation by charities, and  $Q$  is the error term. The solicitation instrument set used in the present study contains 14 binary variables: solicitation (1) via door-to-door collection; (2) via street collection; (3) via a sponsor campaign; (4) via church collection; (5) via collection at work; (6) via television campaign or telethon; (7) via direct mail; (8) via the Internet/e-mail; (9) via collection during an event; (10) via collection through a membership organization; (11) via advertisement; (12) via buying something; and (13) via lottery tickets.

For IV estimates to be consistent and valid, the following three conditions must be met: (1) The instruments should be *relevant* for donating decision; (2) Exclusion restrictions must be met; and (3) Monotonicity must not be violated. For condition one, there are several reasons why solicitation is a relevant determinant of donating. The solicitation for money puts social pressure on the individual solicited and increases the likelihood that they will agree to donate. Some people donate even though they are not asked to do so, but we expect that their propensity to donate will be lower than that of those that are solicited; therefore, we expect there to be a positive relationship between solicitation and subsequent donation. Nonetheless, we must still ensure that instruments are highly correlated with the variable they instrument for; in this case, amount donated and donated dummy. This is commonly judged by an  $F$  test on the joint statistical significance of instruments in a regression model in which the endogenous variable is the dependent variable (the first stage). Bound et al. (1995) suggested that this  $F$  statistics should be large and statistically significant; as a rule of thumb, Staiger and Stock (1997) suggest that an  $F$  statistics  $<10$  could be indicative of weak instruments. Exclusion restrictions must also be met; instruments should not be correlated with unobserved characteristics that can affect happiness. That is, we need to be sure that solicitation does not affect happiness directly. Some individuals might not like being solicited for money, which might negatively affect their happiness; if so, our results might be the lower bound of the effect of donation on happiness. Nonetheless, the exclusion restriction would be violated if charities select individuals to be solicited not randomly.

### Solicitation as a Selection Strategy

Given their limited time and resources, charities cannot possibly solicit every individual for donation to a particular goal; therefore, they target those with the greatest donation potential. To do so, many charitable organizations maintain detailed records of all individuals that have donated to their charity (Jonker et al. 2000). They draw heavily on their own mailing lists to improve target selection. Charities target individuals for solicitation that tend to be likely to donate. Those solicited are likely to have a higher income, higher level of education, and have wider networks than those not solicited.

## Solicitation as a Stimulus

Solicitation can also affect the decision to donate by functioning as a stimulus that mobilizes potential donors in ways that are independent of targeting individuals that are more likely to donate. Charities provide donors with detailed information about who needs money, when they need it, and how much they need. By providing such information, solicitation reduces the information costs of donation, thereby stimulate donation.

While a charity will identify its potential donor pool, there is also an element of randomization because from the identified pool, they solicit a subset of individuals randomly. For instance, Jonker et al. (2000) reported that 5300 individuals were randomly selected for solicitation from among 800,000 individuals in a large Dutch charitable organization's database. Similarly, field-work conducted by Huck and Rasul (2011) showed that direct mail solicitation for a charitable cause was sent to individuals that were randomly selected from a database of individuals that had purchased at  $\geq 1$  tickets from Bavarian State Opera House during the 12 months prior to the direct mail solicitation.

The present study's dataset used for estimation (the GINP) is an opt-in panel; respondents agreed to answer a questionnaire on pro-social behavior and, as such, were considered more likely to be interested in pro-social activities. Furthermore, some of the opt-in panel respondents had been solicited for donation during the previous 2 weeks, whereas, other were not. As 2 weeks is a short period of time, we think that it is more likely that those solicited are not systematically different from those unsolicited.

As charities target educated, high income individuals, the present study controlled for level of education and financial status, so as to obtain unbiased estimates of the effect of donating. Yet, as charities generally know donors' postal code and previous donation amounts which can be used as a proxy for wealth, it is possible that there could be unobserved differences in wealth between solicited and unsolicited individuals.

The nature of different types of solicitation raises concerns about selection bias. For instance, one concern is that an individual needs to be sufficiently healthy to leave home and be solicited for donation on the street. To address this concern, the present controlled for health status.

The monotonicity assumption requires that charitable solicitation either has no effect on donating or affects donating in the same direction whenever it has any effect. Charitable solicitation might not affect everybody the same way. For instance, generous people might donate more than less generous people in response to solicitation. That is, there could be heterogeneous effects. Even if the effects of solicitation on donation are heterogeneous, Imbens and Angrist (1994) show that as long as people do not donate less than they intended to when solicited, IV estimates remain valid. In fact, some people might be discouraged from donating when they are solicited. Diamond and Noble (2001) observed that in response to frequent solicitation, donors develop defense mechanisms, such as throwing away direct mail requests. Using data from Dutch charities' databases, Van Diepen et al. (2006) noted that additional appeals initially generate more donations, but at a certain point, donors become unresponsive.

## Data

The present study used two datasets suitable to the study's aim: (1) the Longitudinal Internet Studies for the Social Sciences (LISS) panel; and (2) the Giving in the Netherlands Panel (GINP). LISS is based on a true probability sample of households drawn from the population register by Statistics Netherlands. LISS is an internet-based panel; however, to eliminate selective sampling, households that otherwise could not have participated were provided with a computer and an Internet connection. Furthermore, to increase the response rate, LISS panel members were given an incentive payment of €7.5 per half-hour of interview time. The GINP is a reliable data source, as it has been used for the basis of macro-economic estimates of donation in the Netherlands. Additionally, the GINP is an opt-in sample of individuals from a pool of 40,000 households available to NIPO (Netherlands Institute of Public Opinion). The pool is representative of the Dutch population with respect to gender, age, level of education, home ownership, household size, and region. To increase the response rate, completing a survey was rewarded with a number of token points, depending on the length of the survey completed, that could be exchanged for a voucher for personal use or for a donation to a charity.

We used five waves of individual-level data from the LISS that were collected annually between 2007 and 2012. Respondents were asked if they had donated money to various types of organizations, such as those for humanitarian aid, environmental protection, and animal rights. These questions were used to construct donated dummy variables. Although questions, from which donated dummy variables were derived, were administered in all five waves, the amount of money donated is available only for two waves. As the study's dependent variable, answers to the following question were used: On the whole, how happy would you say you are? (answered via an 11-point Likert-type scale). This question was used to calculate the happiness score, as respondents answered based on their subjective assessment of their happiness.

Using the LISS panel, we controlled for gender, age, place of residence, level of education, employment status, monthly net income, number of household members, number of children living at home, marital status, membership in a social organization, and whether or not the respondent has participated in a social organization event,<sup>1</sup> as well as health status related to such covariates as self-reported health status, long-term disease, and days hospitalized in the previous 12 months.

The 2002 baseline sample for GINP was followed-up in 2004, 2006, 2008, and 2010. Unfortunately, a measure of subjective wellbeing is available only for the 2006 wave; therefore, the 2006 wave of the GINP was used in the present study. GINP respondents were asked to report their life satisfaction (on a 7-point Likert-type scale) and whether or not they had made a charitable donation and the amount donated during the previous 2 weeks in response to 13 types of fundraising efforts. The amount of money donated was calculated based on answers given to these questions. The GINP has fewer covariates than those of LISS. The GINP variables we controlled for were gender, age, community size, province place of residence, level of education,

<sup>1</sup> The LISS panel contains many variables on personality that might be important for donating behavior. We did not use these personality variables in our analysis because the longitudinal nature of the data allows for controlling time-invariant personality factors.

employment status, number of household members, number of children living in the household, marital status, and income from employment.

Analysis of LISS was based on 22,560 observations from 7564 individuals. Descriptive statistics appears in Appendix Table 7. Overall, 39% of the respondents reported that they donated to a charity. The mean donation among donors was €45.71. GINP analysis was based on observations from 1305 individuals. Descriptive statistics appears in Appendix Table 8. Overall, 48% of the respondents reported that they donated during the previous 2 weeks; the mean donation for the whole sample was €4.74 and the mean donation among donors was €9.89.

## Results

Regression results are provided with four specifications. In the first specification, the amount of money donated is included in the model, whereas the second specification includes a dummy variable for donating to capture potential non-linear relationships between happiness and donating. To identify other types of non-linear relationships, the third specification includes the amount of money donated and a dummy variable for donating, whereas the fourth specification includes the amount of money donated and its squared. The results of each specification are shown in columns 1–4 of Table 1. For all models, happiness score was treated as a continuous variable. Additionally, all the models report about the effect of income to happiness, so that the size of the effect can be considered in context via comparison of the coefficient of income and indicators of donating. All the following regression results follow the same structure.

**Table 1** Random effect regressions output for happiness

	(1)	(2)	(3)	(4)
Income	0.00279**	0.00086	0.00242**	0.00247**
(in €1000)	(2.50)	(0.73)	(2.22)	(2.29)
Amount donated	0.23848		0.22595	0.85361***
(in €1000)	(1.27)		(1.21)	(2.78)
Amount donated squared				−0.89378**
(in €1000)				(−2.40)
Donated dummy		0.05779***	0.04365*	
		(3.97)	(1.76)	
Baseline controls	+	+	+	+
Number of observations	7697	22,560	7697	7697
Number of individuals	4822	7564	4822	4822
Joint <i>F</i> test <i>P</i> value	0.20	0.00	0.11	0.02
Hausman test <i>P</i> value	0.00	0.00	0.00	0.00

Standard errors are robust, clustered at the individual level, *z* statistics in ( ), \**P* < 0.10, \*\**P* < 0.05, \*\*\**P* < 0.01



## LISS Panel

Table 1 shows the random effect regression estimates of the effects of donating on happiness. Column 1 shows that the amount of money donated was not significantly associated with happiness. Column 2 shows that the donated dummy variable was positively and significantly associated with happiness. These findings suggest that there is some type of non-linear relationship between donating behavior and happiness. Column 3 shows that the amount of money donated and the dummy variable for donating were not significantly associated with happiness at the 5% level. Column 4 indicates that there was a concave relationship between the amount of money donated and happiness.

One drawback of random effect results is that unobserved differences in individual innate characteristics are not adequately controlled for in such models. The longitudinal structure of the LISS panel facilitates controlling for unobserved individual differences with a fixed effect model; however, for identification of a fixed effect model, there must be change<sup>2</sup> in donating status over time. In the LISS panel, there is a considerable variation in donating status: 21% of those that did not donate during a one time period donated during the next time period and, conversely, 38% of those that donated during one period did not donate in during the next.

The results of the fixed effect models are shown in Table 2. Column 1 shows that the amount of money donated was not significant in explaining happiness score, whereas, column 2 shows that the dummy for donating was significant in explaining happiness score. Columns 3 and 4 show that there were not any significant relationships between indicators of donation and happiness. We think the reason that only column 2 shows the significant relationship between donating and happiness is because the samples in columns 1, 3, and 4 were much smaller.

The fixed effect findings are interesting, as the effect of engaging in donation persists after controlling for an extensive set of control variables that could be considered to constitute major shocks to happiness, such as changes in marital status, income, and employment. Comparison of the coefficient of income and the donated dummy for column 2 in Table 2 indicates that donating increases happiness to a greater degree than an increase in income.

The Hausman test was used to determine if the random effect results are justifiable. As all *P* values in the bottom row of Table 1 are 0.00, fixed effect results are preferred. Based on LISS data, the amount of money donated did not have an effect on happiness, but donating was associated with higher happiness scores (column 2 of Table 2). It is possible that observation of an effect only in column 2 of Table 2 was because the number of observations in the other columns is much lower.

## Giving in the Netherlands Panel

Table 3 shows ordinary least squares (OLS) estimates of the effect of donating on life satisfaction, based on 2006 wave of the GINP data. Unlike the LISS panel results, the dummy for donating was not significant in the second column of Table 3. The

<sup>2</sup> We assume these changes in donating status are exogenous. Yet, even if it is driven by income shocks, it does not pose a problem for our estimation methodology as income is included in the set of control variables.

**Table 2** Fixed effect regressions output for happiness

	(1)	(2)	(3)	(4)
Income	-0.00202	0.00073	-0.00212	-0.00210
(in €1000)	(-1.03)	(0.37)	(-1.03)	(-1.03)
Amount donated	-0.16473		-0.15266	0.08736
(in €1000)	(-0.91)		(-0.84)	(0.25)
Amount donated squared				-0.33775
(in €1000)				(-0.93)
Donated dummy		0.04501***	0.02467	
		(2.77)	(0.73)	
Baseline controls	+	+	+	+
Number of observations	7697	22,560	7697	7697
Number of individuals	4822	7564	4822	4822
Joint <i>F</i> test <i>p</i> value	0.36	0.01	0.48	0.29

Std.err. Are robust, clustered at individual level, *z* statistics in ( ), \**P* < 0.10, \*\**P* < 0.05, \*\*\**P* < 0.01

difference in findings might stem from the fact that the LISS considers annual donation, whereas the GINP considers donating during the previous 2 weeks. The fourth column of Table 3 indicates that there was a concave relationship between the amount of money donated and life satisfaction.

#### IV Estimates

In this section, we use instruments for donating. With reference to the validity of the instruments used, Table 4 shows the estimates of the first stage of regression. Column 1 corresponds to a specification that controls for all control variables. The findings

**Table 3** OLS regressions output for life satisfaction

	(1)	(2)	(3)	(4)
Income	0.12760***	0.13301***	0.13291***	0.13091***
(in €1000)	(2.60)	(2.74)	(2.73)	(2.68)
Amount donated	0.67809		0.35825	8.14134*
(in €1000)	(0.31)		(0.15)	(1.78)
Amount donated squared				-59.21891**
(in €1000)				(-2.39)
Donated dummy		0.00536	0.00185	
		(0.08)	(0.02)	
Baseline controls	+	+	+	+
Number of observations	1305	1305	1305	1305
Joint <i>F</i> test <i>P</i> value	0.76	0.94	0.98	0.02

Standard errors are robust, *z* statistics in ( ), \**P* < 0.10, \*\**P* < 0.05, \*\*\**P* < 0.01

**Table 4** The first stage regressions of donation and donated dummy

	Donation (OLS)	Donation (OLS)	Donated (Probit)	Donated (Probit)
Door-to-door collection	2.810** (2.55)	2.727** (2.46)	1.140*** (8.10)	1.190*** (8.22)
Street collection	-1.073 (-0.59)	-1.078 (-0.59)	-0.274 (-1.15)	-0.328 (-1.35)
Sponsor campaign	1.880 (1.27)	1.905 (1.28)	-0.258 (-1.38)	-0.235 (-1.21)
Collection at church	9.727*** (8.09)	9.696*** (8.04)	1.447*** (6.15)	1.519*** (6.21)
Collection at work	-0.000 (-0.00)	0.434 (0.10)	0.158 (0.27)	0.260 (0.43)
Television campaign	2.339* (1.93)	2.261* (1.85)	-0.937*** (-6.37)	-0.974*** (-6.48)
Direct mail letter	5.811*** (5.07)	5.809*** (5.06)	-0.189 (-1.27)	-0.171 (-1.13)
Via Internet/e-mail	-1.315 (-0.48)	-1.767 (-0.63)	-0.200 (-0.64)	-0.279 (-0.87)
Collection during an event	3.614 (0.78)	4.116 (0.89)	-0.157 (-0.23)	-0.381 (-0.55)
Collection via membership organization	6.884 (1.43)	6.589 (1.36)	-0.231 (-0.78)	-0.265 (-0.89)
Appeal via advertisement	-5.518** (-2.17)	-5.654** (-2.21)	0.026 (0.10)	0.052 (0.19)
Via buying something	0.838 (0.48)	0.764 (0.44)	0.129 (0.58)	0.115 (0.50)
Via lottery tickets	8.723*** (5.48)	8.598*** (5.37)	-0.312 (-0.41)	-0.450 (-0.57)
Was not solicited for donation	-0.617 (-0.50)	-0.744 (-0.60)	-	- <sup>a</sup>
Baseline controls	+	+	+	+
Dummies for diseases	-	+	-	+
Test of H <sub>0</sub> : the instruments are jointly 0				
<i>F</i> statistics (Chi <sup>2</sup> )	17.53	17.23	145.17	144.71
<i>P</i> value	0.00	0.00	0.00	0.00
<i>n</i>	1305	1305	769	769

Z statistics in ( ). \**P* < 0.10, \*\**P* < 0.05, \*\*\**P* < 0.01

<sup>a</sup>No solicitation predicts failure perfectly; therefore, 527 observations dropped

indicate that solicitation is an important determinant of donation. The *F* statistics presented in the bottom row of each column clearly exceeds 10 and *P* values are 0.00; therefore, it was concluded that a weak instrument problem did not exist. When

dummy variables for various diseases are added to control for physical health, the  $F$  statistics remained almost the same (shown in Table 4, column 2). This is reassuring for the use of our instruments.

There is no formal way to test whether exclusion restrictions hold or not. But, one way to justify the use of IV is to determine whether the solicited or unsolicited individuals are not systematically different from each other in observable characteristics. If they are balanced, this could be an indication for justifying the use of instruments. For IV analysis, 13 types of solicitation were used. For ease of exposition, respondents that were exposed to more than the median number of solicitations and those exposed to less than the median number of solicitations were compared.

Table 9 shows sample means of all controls used for the regression analysis median number of solicitations. These two groups of respondents differed in terms of age, gender, marital status, place of residence, and community size. As expected, those that were solicited more than the median number of solicitation had higher income from employment, yet the difference between the two groups is not significant. Given the proliferation of fundraising activities by charities, we thought unsolicited individuals should be a few people. Nonetheless, Table 10 indicates that 40.4% of respondents were not solicited during the previous 2 weeks. We also looked for change in solicitation status over time; if the same individuals were solicited or not during each wave. In all, 32% ( $n = 521$ ) of those solicited in during a one time period were not solicited during the next. Similarly, 48% ( $n = 365$ ) individuals that were not solicited during a one time period were solicited during the next. These findings indicate that there is considerable change in the respondents' experience of solicitation.

The monotonicity assumption was another concern. Monotonicity implies that with one more solicitation, the respondent might be induced to donate, but should not give less than her intended amount. As with exclusion restrictions, this assumption cannot be tested formally; however, the types of solicitation were converted into numbers of solicitations to study the potential discouragement at higher levels of solicitation. Table 11<sup>3</sup> shows the regression results for donation according to the number of solicitations, as compared to that of a reference category of no solicitation. In columns 1, 3, and 4, all the coefficients are positive and increasing as well. In column 2, again, all coefficients are positive, except for nine solicitations. The findings suggest that the respondents were not less likely to donate as the number of solicitations increased. In total, these findings show that there is no evidence that the monotonicity assumption is implausible.

Table 5 shows the IV regression results for life satisfaction. All results include full control variables. Also shown are the overidentifying restrictions test's (Sargan's statistics)  $P$  value and a test of exogeneity (Wu-Hausman statistics) for indicators of donation. In the 1st, 3rd, and 4th columns, exogeneity test being rejected suggests that indicators of donation are endogenous for explaining life satisfaction. Given that the overidentifying restrictions test's  $P$  value was  $>0.05$  in the 1st, 3rd, and 4th columns, it was concluded that the instruments were reasonably valid. The IV estimates from model (1) and model (3) show that the amount on money donated affected life

<sup>3</sup> All the available waves of the GINP survey were used, not only the 2006 wave, so as to maximize estimation power; however, the same regressions were run for the 2006 dataset separately. The estimates were almost the same, but  $p$  values were slightly higher.

**Table 5** IV regression output for life satisfaction (GINP data)

	(1)	(2)	(3)	(4)
Income (in €1000)	0.12226** (2.47)	0.13301*** (2.77)	0.11955** (2.39)	0.12345** (2.49)
Amount of money donated (in €1000)	12.65022** (2.03)		19.31787** (2.03)	5.02620 (0.40)
Amount of donated squared (in €1000)				95.98539 (0.56)
Donated dummy		0.00577 (0.07)	-0.14116 (-1.20)	
Baseline controls	+	+	+	+
Number of observations	1305	1305	1305	1305
Overidentifying restrictions <i>P</i> value	0.27	0.09	0.35	0.22
Test of exogeneity ( <i>P</i> value)	0.1	0.99	0.02	0.09
Joint <i>F</i> test <i>P</i> value	0.04	0.94	0.11	0.23

Standard errors are robust and in ( ), \**P* < 0.10, \*\**P* < 0.05, \*\*\**P* < 0.01

satisfaction. The IV results from model (1) suggest that increasing monetary donations by €1 increases life satisfaction by 0.013 points on the 0–7 life satisfaction scale.

Columns 2 and 3 of Table 5 show that there was not a significant relationship between indicators of donating and life satisfaction, but column 3 indicates that donation has a significant linear effect on life satisfaction. To give the reader some idea about the size of the estimates, the coefficient of income and donation was compared.<sup>4</sup> Column 1 of Table 5 indicates that for equivalent life satisfaction, increasing the amount of money donated by €1 corresponded to a €104 increase in income. These estimates show the effect of donating on life satisfaction for “compliers”, i.e., the effect on life satisfaction in those that donated an extra €1 in response to being asked to do so, but would not have donated if they were not solicited. Whether we can generalize the effects of donating on life satisfaction to a whole population depends on the characteristics of the “compliers” in the data set. The “compliers” are not likely to be representative of the general Dutch population as the GINP is not a representative sample but an opt-in panel and the participants are likely to be more pro-social than average person in the Netherlands. Thus, IV estimates might not reflect the average treatment effect. Therefore, extrapolation is not meaningful. This €104 is put to give a feeling about the effect size.

### Robustness Checks

This section examines the robustness of the baseline IV results for different specifications, samples analyzed, and instruments selected. The results appear in Table 6. In panel A of Table 6, we first controlled for whether or not a respondent or anyone close

<sup>4</sup> This comparison can only be exactly correct when income is an exogenous variable, but, it is very likely that income is an endogenous variable. Nonetheless, this comparison might provide some idea about the effect size.

to them had any disease during their previous 12 months, and then 11 dummy variables were generated for 11 diseases.<sup>5</sup> Inclusion of the disease dummy variables did not change the magnitude of the effect of the amount money donated on life satisfaction.

Income from employment was used for the baseline model, as it is not measured in brackets which facilitates marginal effect comparisons; however, it does not accurately indicate total household income. We used total household income as a variable, but it was bracketed by €500 increment; therefore, we investigated whether or not using total household income makes any difference in the effect size. Panel b of Table 6 reports very similar estimates to our baseline results.

Panel c in Table 6 checks the sensitivity of our baseline results to a different subset of instruments. Targeting by charities might be more often in the case of personal solicitations, such as direct mail and door-to-door collection. Moreover, solicitation via a membership organization collection drive might capture sociability differences between people. To check whether direct personal solicitation types are driving our results or not, we discarded direct mail solicitation, door-to-door collection, and collection via membership organization from the instrument set and the instrument set was limited to the remaining types of solicitation.<sup>6</sup> The results are close to our baseline results but slightly less precise.

## Discussion

The LISS panel is a true probability sample of households in the Netherlands, whereas GINP, is an opt-in web-panel. Although the pool from which GINP respondents were drawn is representative of the general Dutch population, with respect to gender, age, level of education, home ownership, household size, and place of residence, there might still be self-selection. Given the increasing body of evidence showing that opt-in web-based research is not as accurate as research based on probability sampling (see Yeager et al. 2011), our ability to draw conclusions about effect sizes and generalizability of the findings based on analysis GINP data is limited. Nonetheless, non-probability samples do have values. We can still document that donating increases life satisfaction in our sample which is sufficient for suggesting the existence of warm glow in that sample.

Annual mean donation per person based on GINP data is estimated to be approximately €114 ( $= €4.74 \times 24^7$ ), versus €37.4 based on LISS data. When we compare the donation amounts in the LISS panel to the GINP, there is a large discrepancy. As the LISS panel asks respondents for an annual donation estimation, recall bias might have affected the estimates; in contrast, GINP asks respondents to report how much they donated during the previous 2 weeks, which is associated with less of a recall bias than estimating a yearly donation total. The recall bias in the LISS might have affected the amount of money reportedly donated more than that of dummy for donating variable;

<sup>5</sup> The diseases included bronchial, cardiovascular, stomach, liver, intestine, kidney, joint, diabetes, nervous system, skin, cancer, brain, and other diseases.

<sup>6</sup> Appeal via street collection, sponsor campaign, church collection, collection at work, television campaigns, an event, advertisement, buying something, lottery tickets, or not solicited.

<sup>7</sup> As GINP asks the amount of money donated in the previous 2 weeks.

**Table 6** Robustness checks (GINP data)

	Life satisfaction
A. adding disease controls	
Amount donated	12.65195**
(in €1000)	(2.13)
<i>n</i>	1305
B. using household income	
Amount donated	13.95156**
(in €1000)	(2.01)
<i>n</i>	1104
C. Using a subset of instruments	
Amount donated	12.53001*
(in €1000)	(1.88)
<i>n</i>	1305

Std. errors are robust, *z* statistics in ( ), \**P* < 0.10, \*\**P* < 0.05, \*\*\**P* < 0.01

therefore, for LISS panel, data regression results based on the dummy for donating might be more accurate.

We also check the timing of fieldwork for both datasets to see whether observing a significant effect in GINP but not in the LISS comes from the timing of the survey. The LISS panel collects donation indicators in February, whereas, the GINP conducts its survey in May. According to the Centraal Bureau Fondsenwerving’s national schedule for door-to-door fundraising, door-to-door fundraising does commonly occur during February or May (CBF 2013). On the other hand, it is also possible that socially engaged people are more likely to participate in an opt-in panel; as such, GINP may overestimate the amount of money donated.

A disadvantage of the LISS panel is that donation information is collected in February, and happiness score is collected during May and June, whereas GINP does measure life satisfaction and donating simultaneously. An advantage of both surveys is that because they are internet-based and anonymously completed, respondents are more likely to answer truthfully.

## Conclusion

The present study aimed to determine if charitable donating increases happiness. In all, data from five waves of the LISS panel and data from the 2006 wave of GINP, both from the Netherlands, were analyzed. Based on LISS data, both random effects and fixed effect specification indicate that donating is associated with an increase in happiness scores. Taking into account the major shocks to happiness, such as changes in marital status, income, and employment, the fixed effect estimates indicate that individuals that donate have 0.045 points higher happiness scores (on a 10-point scale), which is a greater increase than is associated with an increase in income: this estimate was statistically significant at the 1% level.

The study also employed instrumental variable estimation. Multiple types of personal solicitation were considered as instruments for donating, as the literature suggests

that solicitation is an effective way to induce people to make charitable donations. The present IV findings suggest that the amount of money donated increases life satisfaction; this effect was statistically significant at the 5% level.

The present findings might be considered useful for informing the design of public policy. A public policy that fosters charitable donation can contribute to solving the social problems of those in need while simultaneously increasing the happiness of donors. In fact, some organizations are currently using such a strategy in different domains of donation. For instance, the American Red Cross tells prospective blood donors that “the need is constant, the gratification is instant.” Yet incentivizing some behaviors that were motivated by non-financial incentives might have destroyed intrinsic motivation (Gneezy and Rusticini 2000); therefore, additional research is needed to more clearly determine if advertising the psychological benefits of donating undermines the increase in happiness donors experience following donation.

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#### Compliance with Ethical Standards

**Conflict of Interest** The author declares that she has no conflict of interest.

## Appendix

**Table 7** Data descriptions, sample means, and standard deviations for the LISS panel: 2007–2012<sup>a</sup>

Variables	Description	Mean (std. dev all)	(within)	Obs (groups)
Happiness	Happiness score, coded so that 0 = totally unhappy, 10 = totally happy	7.58 (1.26)	(0.64)	22,560 (7564)
Health	Individual assessment of health in the past year; 1 = very poor, 5 = excellent	3.13 (0.75)	(0.37)	22,560 (7564)
Long-standing disease	Suffering from a long-standing disease, affliction, handicap, or an accident	0.3 (0.46)	(0.17)	22,560 (7564)
Days hospitalized	Time spent in hospital or a clinic over the past 12 months (days)	0.53 (4.75)	(3.67)	22,560 (7564)
Female	Gender of the respondent, women = 1	0.54 (0.5)	(0.01)	22,560 (7564)
Age (years)	Age in CBS (Statistics Netherlands) categories	4.87 (1.59)	(0.22)	22,560 (7564)
Married	Civil status, married = 1	0.6 (0.49)	(0.09)	22,560 (7564)
Never married	Civil status, never been married = 1	0.27 (0.44)	(0.06)	22,560 (7564)
Not urban		0.15 (0.36)	(0.05)	22,560 (7564)



**Table 7** (continued)

Variables	Description	Mean (std. dev all)	(within)	Obs (groups)
	Urban character of place of residence, rural = 1			
Slightly to moderately urban	Urban character of place of residence, slightly urban = 1/moderately urban = 1	0.45 (0.5)	(0.06)	22,560 (7564)
Employed	Paid employment/in family business/freelancer, or self-employed	0.54 (0.5)	(0.15)	22,560 (7564)
Income	Personal net monthly income in Euros	1595.5 (5644.26)	(3040.64)	22,560 (7564)
Education	Level of education in CBS (Statistics Netherlands) categories	3.43 (1.51)	(0.28)	22,560 (7564)
Household size	Number of household members	2.66 (1.31)	(0.26)	22,560 (7564)
Number of children	Number of living-at-home children in the household	0.86 (1.14)	(0.23)	22,560 (7564)
Member	Member of a social organization	0.71 (0.45)	(0.28)	22,560 (7564)
Participated in an event	Participated in a social organization event	0.33 (0.47)	(0.34)	22,560 (7564)
Donation amount	Monthly donation and gifts expenditure (past 12 months)	37.4 (64.1)	(35.76)	7697 (4822)
Donated dummy	Dummy for donating	0.39 (0.49)	(0.31)	22,560 (7564)
Volunteering hours	Hours spent on voluntary work per week on average over past 12 months	2.04 (6.07)	(3.94)	22,560 (7564)
Volunteer dummy	Dummy for volunteering	0.36 (0.48)	(0.26)	22,560 (7564)

<sup>a</sup> Mean years of participation for the sample is 2.98

**Table 8** Data descriptions, sample means, and standard deviations for the GINP: 2006 wave

Variables	Description	Mean (std. dev. all)
SWB	Are you satisfied with your life? 7-scale (0 = No, 7 = Yes)	4.31 (1.28)
Age	Age in years at interview	46.98 (16.39)
Female	Gender of the respondent, women = 1	0.53 (0.5)
Married	Marital status, married = 1	0.68 (0.47)
Never been married	Marital status, never been married = 1	0.32 (0.47)
Household size	Number of household members	2.59 (1.25)
number of kids	Number of children	0.84 (1.13)
Place of residence	Province of residence	
	Groningen	0.04 (0.2)
	Friesland	0.03 (0.18)
	Drenthe	0.04 (0.2)

**Table 8** (continued)

Variables	Description	Mean (std. dev. all)
	Overijssel	0.07 (0.25)
	Flevoland	0.03 (0.18)
	Gelderland	0.13 (0.33)
	Utrecht	0.06 (0.23)
	Noord-Holland	0.15 (0.36)
	Zuid-Holland	0.2 (0.4)
	Zeeland	0.03 (0.17)
	Noord-Brabant	0.15 (0.35)
	Limburg	0.07 (0.25)
Community size	Type of community	
	<10,000 inhabitants	0.02 (0.15)
	10,000–20,000 inhabitants	0.11 (0.32)
	20,000–50,000 inhabitants	0.35 (0.48)
	50,000–100,000 inhabitants	0.22 (0.42)
	>100,000	0.29 (0.46)
Education	Highest completed level of education categories	4.08 (1.64)
Employed	Has paid job	0.59 (0.49)
Income	Net monthly income from employment	698.73 (886.84)
Donated dummy	Dummy for donating or not in the last 2 weeks	0.48 (0.5)
Donation amount	Total amount donated in last 2 weeks	4.74 (14.57)
Volunteer dummy	Dummy for volunteering or not in the last year	0.4 (0.49)
Volunteering hours	Hours usually spent on volunteering in a month (reference: last year)	6.25 (15.45)

Number of observations is 1305 for the sample

**Table 9** Balance of observables by median solicitation (1 solicitation)

	>Median mean (SD)	<=Median mean (SD)	Difference (std. error)
Age	48.75 (16.04)	46.26 (16.49)	3.459 (0.505)***
Female	0.57 (0.5)	0.51 (0.5)	0.036 (0.016)**
Married	0.73 (0.45)	0.66 (0.47)	0.056 (0.014)***
Never been married	0.27 (0.45)	0.34 (0.47)	-0.053 (0.014)***
Household size	2.57 (1.26)	2.6 (1.25)	0.032 (0.039)
number of kids	0.81 (1.1)	0.84 (1.14)	-0.002 (0.034)
Province lived			
Groningen	0.04 (0.2)	0.04 (0.2)	-0.006 (0.006)
Friesland	0.04 (0.2)	0.03 (0.17)	0.003 (0.005)

**Table 9** (continued)

	>Median mean (SD)	<=Median mean (SD)	Difference (std. error)
Drenthe	0.04 (0.19)	0.05 (0.21)	0.01 (0.006)*
Overijssel	0.1 (0.3)	0.05 (0.22)	0.023 (0.008)***
Flevoland	0.03 (0.17)	0.03 (0.18)	-0.007 (0.005)
Gelderland	0.13 (0.33)	0.13 (0.33)	0.002 (0.01)
Utrecht	0.06 (0.24)	0.06 (0.23)	0.008 (0.008)
Noord-Holland	0.13 (0.33)	0.16 (0.37)	-0.03 (0.011)***
Zuid-Holland	0.22 (0.42)	0.2 (0.4)	0.009 (0.013)
Zeeland	0.04 (0.19)	0.03 (0.16)	0.006 (0.006)
Noord-Brabant	0.13 (0.34)	0.15 (0.36)	-0.013 (0.011)
Limburg	0.05 (0.21)	0.08 (0.27)	-0.005 (0.008)
Community size			
< 10,000 inhabitants	0.03 (0.18)	0.02 (0.14)	0.007 (0.004)*
10,000–20,000 inhabitants	0.15 (0.35)	0.1 (0.3)	0.035 (0.01)***
20,000–50,000 inhabitants	0.34 (0.48)	0.35 (0.48)	0.048 (0.015)***
50,000–100,000 inhabitants	0.23 (0.42)	0.22 (0.42)	-0.015 (0.013)
> 100,000	0.25 (0.44)	0.31 (0.46)	-0.075 (0.014)***
Education	4.17 (1.61)	4.05 (1.65)	0.15 (0.052)***
Employed	0.57 (0.5)	0.6 (0.49)	-0.032(0.015)**
Income from employment	673.64 (893.54)	708.93 (884.38)	15.323 (29.398)
Volunteer	0.58 (0.49)	0.33 (0.47)	0.226 (0.015)***
Predicted life satisfaction (using OLS)	4.39	4.3	
<i>n</i>	377	928	

**Table 10** Distribution of the number of solicitations (GINP data)

	Percentage
No solicitation	40.38
1 solicitation	30.73
2 solicitations	14.41
3 solicitations	8.66
4 solicitations	3.07
5 solicitations	1.76
6 solicitations	0.77
7 solicitations	0.15
8 solicitations	0.08
9 solicitations	40.38
<i>n</i>	1305

**Table 11** Regression results for donation, according to the number of solicitations

	Donation	Donation	Donated	Donated
1 solicitation (ref: no solicitation)	4.69141*** (4.46)	4.18274*** (4.62)	2.25274*** (33.72)	3.10345*** (19.39)
2 solicitations	7.04867*** (5.26)	7.99458*** (6.79)	2.32396*** (30.45)	3.30207*** (18.43)
3 solicitations	10.86927*** (6.41)	11.08830*** (7.75)	2.40552*** (26.41)	3.31182*** (16.32)
4 solicitations	15.92029*** (7.11)	17.78891*** (7.88)	2.32329*** (20.90)	3.18291*** (12.27)
5 solicitations	18.91780*** (5.94)	19.31779*** (6.63)	2.46004*** (15.55)	3.36825*** (9.37)
6 solicitations	18.88510*** (3.71)	24.67108*** (5.68)	2.34976*** (9.83)	2.97722*** (6.67)
7 solicitations	8.34907 (1.10)		2.40950*** (6.72)	
8 solicitations	11.00450 (0.99)	14.98826 (1.55)	2.31817*** (4.46)	
9 solicitations	22.88525** (2.57)	-2.15704 (-0.16)	2.88922*** (5.04)	
10 solicitations	41.84475*** (2.84)		1.57382** (2.46)	
Full controls	+	+	+	+
Disease dummies	-	+	-	+
<i>n</i>	4631	1305	4847	1517

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