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LOCUS OF CONTROL AND PROSOCIAL BEHAVIOR

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Locus of Control and Prosocial Behavior

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ABSTRACT

We investigate how locus of control beliefs – the extent to which individuals attribute control over events in their life to themselves as opposed to outside factors – affect prosocial behavior and the private provision of public goods. We begin by developing a conceptual framework showing how locus of control beliefs serve as a weight placed on the returns from one’s own contributions (impure altruism) and others contributions (pure altruism). Using multiple data sets from Germany and the U.S., we show that individuals who relate consequences to their own behavior are more likely to contribute to climate change mitigation, to donate money and in-kind gifts to charitable causes, to share money with others, to cast a vote in parliamentary elections, and to donate blood. Our results provide comprehensive evidence that locus of control beliefs affect prosocial behavior.

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1 Introduction

Starting with Andreoni (1989), a rich literature has set forth to uncover the motives for the private provision of public goods. This work has largely focused on two distinct motives – concerns for the benefits to oneself (impure altruism) and concerns for benefits to others (pure altruism) – and the design of empirical strategies to disentangle the relative importance of each (Ottoni-Wilhelm et al., 2017; Hungerman and Ottoni-Wilhelm, 2021).¹ In this paper, we explore a potential psychological underpinning of such motives – locus of control (LOC) beliefs. LOC measures the extent to which an individual believes that events in their life are shaped by their own actions (Gatz and Karel, 1993; Rotter, 1966). Specifically, individuals who believe that they have control over the outcome of events in their lives are considered to have an internal LOC. In contrast, those who believe that life is controlled by chance or fate are considered to have an external LOC.

We incorporate the notion of LOC into a model of public good provision as weights that the individual places on the returns to one’s own contribution (impure altruism) and the weights placed on aggregate contributions (pure altruism). Our approach formalizes work in social psychology arguing that those with an internal LOC are more likely to help others or act in an environmentally friendly manner because they believe that such efforts can bring about change (Midlarsky and Midlarsky, 1973; Trevino and Youngblood, 1990; Bierhoff et al., 1991; Bierhoff, 2007).² In doing so, we show how public good provision is directly related to the extent individuals believe that they have control over the events that shape their lives; such individuals are more likely to believe that social problems can be solved through action and that the subjective benefits of acting in a prosocial manner outweigh the costs of doing so.

¹Although the warm-glow model (Andreoni, 1989) is the canonical example, there are other models that focus on the relative importance of benefits to self, including work on social identity (Benjamin et al., 2010; Kessler and Milkman, 2018), social pressures (DellaVigna et al., 2012; Knutsson et al., 2013; Andreoni et al., 2017), or prestige/“snob appeal” (Glazer and Konrad, 1996; Kumru and Vesterlund, 2010; Romano and Yildirim, 2001).

²In fact, internal LOC is listed in a textbook chapter by (Bierhoff, 2007) as one of four personality constructs defining the “prosocial personality”.

We evaluate the association between LOC and prosocial behavior using data from three distinct sources; (i) primary survey and experimental data from Germany related to green energy and carbon offsetting, (ii) primary survey and experimental data from Arizona related to charitable giving, and (iii) secondary data from Germany related to a variety of prosocial actions – charitable giving, sharing with others in a hypothetical dictator game, blood donation, and voting. In each setting, we observe an individual specific measure of LOC and correlate it with eight different prosocial acts; (i) the likelihood of having a green electricity tariff, (ii) the willingness to pay increased levies to subsidize the generation of renewable energy, (iii) the purchase of carbon offsets, (iv) monetary and in-kind contributions to charity in the past year, (v) the amount shared with charitable recipients in a modified dictator game, (vi) the amount shared with others in a standard dictator game, (vii) the likelihood of donating blood, and (viii) the likelihood of having voted in the 2009 federal elections in Germany.

Empirical results are consistent with the conceptual model and show the importance of LOC beliefs on prosocial behavior. Across all outcomes of interest, we find that those with an internal LOC are more prosocial than counterparts with an external LOC. For example, we find that a one standard deviation in LOC generates an approximate 2.3 percentage point increase in the likelihood an individual reports having a green electricity tariff and a 4 percentage point increase in the likelihood that they would be willing to pay an increased levy to subsidize renewable energy. Similarly, we find that a one standard deviation increase in LOC leads to an approximate 9.1 percent increase in the amount allocated for carbon offsets and significantly increases both the likelihood of having donated to a charity in the past year and the subsequent amount given – a result that holds for respondents in both Arizona and Germany. Finally, we find that a one standard deviation increase in LOC generates an approximate 10 percent increase in the likelihood that the respondent donated blood in the past year and a 4.6 percent increase in the likelihood of having voted in the 2009 German elections.

Our paper contributes to several strands of the literature. First and foremost, our paper builds upon a growing body of work exploring the relationship between LOC beliefs and economic outcomes such as investments in human capital (Coleman and DeLeire, 2003; Hadsell, 2010), job search (Caliendo et al., 2015; McGee, 2015; McGee and McGee, 2016), savings/financial investments (Cobb-Clark et al., 2016; Salamanca et al., 2020), healthy habits (Cobb-Clark et al., 2014), and technology adoption by farmers in developing countries (Abay et al., 2017). We extend this literature by exploring the relationship between LOC beliefs and prosocial behavior as displayed through the private provision of public goods.³ In this regard, our paper is closest in spirit to Boone et al. (1999) who use experimental data to show that those with a high internal LOC are more likely to cooperate in repeated prisoner’s dilemmas. However, unlike this prior work, we explore behavior across multiple domains using both experimental games and the response to survey questions regarding field behavior.

More broadly, our paper contributes to a growing body of work exploring the role of personality attributes and cognitive ability on economic outcomes of interest. This literature can be broken down into two distinct subgroups; (i) studies examining the effect of such attributes on preference parameters such as attitudes towards risk, ambiguity, or time (Borghans et al., 2008; 2009; Burks et al., 2009; Daly et al., 2009; Dohmen et al., 2010; Becker et al., 2012; Benjamin et al., 2013) and (ii) studies examining the effect of such attributes on outcomes such as cooperative behavior (Proto et al., 2019), worker productivity and the response to incentives (Cubel et al., 2016; Donato et al., 2017), or sorting in marriage markets (Dupuy and Galichon, 2014). Our paper extends this body of literature by exploring the effects of LOC beliefs on a suite of prosocial behaviors. In

³There is a body of work in psychology exploring how LOC influences the willingness to help others (Midlarsky and Midlarsky, 1973; Benson et al., 1980; Bierhoff et al., 1991; Midlarsky et al., 2005) or specific environmental behaviors such as recycling paper or washing only full loads of laundry (Hines et al., 1987; Allen and Ferrand, 1999; Engqvist Jonsson and Nilsson, 2014). However, such studies rely upon small samples – often samples of convenience – and focus on identification of psychological mechanisms rather than attendant public good provision. Moreover, many of these studies rely upon imprecisely measured outcomes such as attitudes or self-reported frequencies and context specific measures of control beliefs.

doing so, we show that such beliefs are fundamentally related to altruism and prosocial behavior.

Second, our paper contributes to the literature on the private provision of public goods and studies designed to uncover individuals' motives for contributing. Broadly speaking, such studies focus on two main drivers – concerns for benefits to oneself and concerns for benefits to others – and attempt to disentangle the two motives by measuring the extent to which gifts by others are a substitute for one's own gift (Kingma, 1989; Andreoni, 1993; Payne, 1998; Andreoni and Payne, 2003; 2011; Eckel et al., 2005; Crumpler and Grossman, 2008; Andreoni et al., 2014; Ottoni-Wilhelm et al., 2017). Our paper extends this line of inquiry by exploring the psychological underpinnings of such motives. In this regard, our paper shares similarity with work in marketing and social psychology exploring the impact of self- and other-benefit appeals on charitable giving (Fisher et al., 2008; White and Pelozo, 2009; Feiler et al., 2012; Baek et al., 2019; List et al., 2021).

Finally, our paper contributes to a literature using individual-level survey data from sources such as the German Socio-Economic Panel (SOEP) to advance our understanding of economic behavior. To date, such studies have focused on questions such as the determinants of subjective well-being (Odermatt and Stutzer, 2019; Rohrer et al., 2018; Clark et al., 2016; Hetschko et al., 2014; Kassenboehmer and Haisken-DeNew, 2009), female labor force participation (Bick, 2016; Domeij and Klein, 2013), assortative mating and income inequality (Eika et al., 2019; Ermisch et al., 2006), or wage growth and inequality (Lagakos et al., 2018; Beaudry and Green, 2003; Maasoumi and Trede, 2001). Our paper shares similarity with many of these studies in that we combine data from multiple sources and compare behavior across countries/cultures. However, our paper differs from this work in that we use information on a personality attribute (LOC beliefs) that is contained within the SOEP to explore its impact on a variety of prosocial acts. In this regard, our paper is closest in spirit to Jaeger et al. (2010) who explore the relationship between risk attitudes and migration and Fuchs-Schündeln and Schündeln (2005) who

explore the relationship between risk attitudes and selection into low-risk occupations.

2 Conceptual Model: LOC and Public Good Provision

We propose a conceptual model of public good provision to motivate our empirical investigations and provide a lens through which to interpret our empirical findings. Our framework builds upon a standard public goods model in the spirit of Bergstrom et al. (1986) and Andreoni (1989). We assume that the preferences of individual i can be represented by the utility function $U_i = U_i(z_i, G, g_i)$, where z_i denotes the consumption of a numeraire good whose price is normalized to one. In addition, consumers are assumed to derive utility from their individual contribution to the public good g_i and from the total level of contributions to the public good $G = g_i + G_{-i}$, which is given by the sum of i 's contribution g_i and the contribution of all others, G_{-i} . Modeling preferences over both the total level of contributions G and the individual contribution g_i allows our model to capture motivations based on pure and impure altruism, respectively. Individuals incur cost c for providing one unit of the public good and spend the remainder of their budget m_i on the numeraire good $z_i = m_i - c g_i$. For simplicity, we assume that preferences are linear in z_i , G , and g_i , which yields the following utility function:

$$U_i(g_i, G_{-i}) = m_i + b_i G(g_i, G_{-i}) + w_i g_i - c g_i, \quad (1)$$

where b_i represents individuals' pure altruism, i.e., their utility gain from a one-unit increase in the total amount of the public good, and w_i captures "warm glow" (Andreoni, 1989) motives for contributing.

Social psychologists have long viewed LOC beliefs as an important attribute underlying prosocial acts such as helping others (e.g., Midlarsky and Midlarsky, 1973; Benson et al., 1980; Bierhoff et al., 1991; Midlarsky et al., 2005) or environmental activism (e.g., Trigg et al., 1976; Engqvist Jonsson and Nilsson, 2014; Chiang et al., 2019). In fact, Bier-

hoff (2007) lists internal control beliefs as one of four personality attributes that define the “prosocial personality”. We formalize this idea by modeling control beliefs, l_i , as weights that individuals place on their own contributions and the returns to aggregate public good provision. In doing so, our model captures sentiment from Paulhus (1983) noting that LOC can be understood as a control belief over individual outcomes (“Can I solve the problem?”) as well as a control belief over sociopolitical outcomes (“Can society solve the problem?”).⁴ This yields an augmented utility function:

$$U_i(g_i, G_{-i}) = m_i + l_i b_i G(g_i, G_{-i}) + l_i w_i g_i - c g_i, \quad (2)$$

where $l_i b_i$ represents the agent’s LOC weighted utility gain from a one-unit increase in the total amount of the public good provided and $l_i w_i$ captures the agent’s LOC weighted “warm-glow” utility.

Under this setup, an individual will contribute to the public good if $l_i(b_i + w_i) \geq c$, i.e., if the perceived benefit of the contribution exceeds its cost. Hence, the propensity for the individual to voluntarily contribute to the public good and act in a prosocial manner is increasing in LOC. As a direct consequence, our model suggests that an internal with a higher l_i is more likely to contribute to the public good than an external with a lower l_i . This constitutes our main research hypothesis; a positive association between LOC beliefs and public good provision. Further, as we are concerned with the private provision of a generic public good, the hypothesized effect of LOC beliefs on behavior should apply across a broad spectrum of prosocial acts; a conjecture we test by exploring behavior across a variety of domains in multiple countries.

Before proceeding, we would like to highlight that, in our model, LOC beliefs share similarity with seed money donations or the provision of donor gifts that serve to signal charitable quality and hence impact the perceived marginal benefit of a donated dollar

⁴Intuitively, the weights in our model reflect that those with an internal LOC are more likely to believe that prosocial acts produce meaningful change and thus perceive a greater return to such acts.

(see, e.g., Vesterlund, 2003; Andreoni, 2006; Landry et al., 2006; Lange et al., 2017). However, there is an important distinction between this literature and our model. In the case of signaling, the perceived benefit of a donation is determined by the actions of others. In our setting, the perceived benefit of a prosocial act is determined by an innate personality trait of the decision-maker.

3 Overview: Data and empirical approach

Our conceptual model highlights a positive association between LOC beliefs and public good provision. To test this hypothesis, we combine data from three distinct sources that each contain information about a variety of prosocial behaviors along with individual specific measures of LOC. The first data set includes primary data from a series of surveys and a field experiment related to green energy and carbon offsetting in Germany. The second data set includes primary data from a survey and experiment related to charitable giving in Arizona. The final data set is secondary survey data from the German Socio-Economic Panel (SOEP), which provides information on voting, blood donation, and charitable giving.

Table 1 summarizes the different data sets and outcome measures of interest. The table is broken into three panels, each of which summarizes the outcomes gathered from a particular source. As noted in the upper panel of the table, we observe three distinct outcomes of interest in the *forsa* data; (i) the likelihood the respondent's household has a green electricity tariff, (ii) the respondent's willingness to pay for increased levies to subsidize renewable energy generation, and (iii) the respondent's allocation to purchase carbon offsets in a modified dictator game. The first two metrics reflect responses to questions that were contained in a 2015 survey designed to understand attitudes towards green electricity. The third outcome comes from a 2019 survey about carbon policy and emissions from the transport sector and reflects how much of a subject's €100-endowment

was allocated to offset carbon emissions.

The middle panel of the table summarizes data from a survey and framed field experiment conducted in the state of Arizona exploring the effect of a state tax credit program on aggregate patterns on giving. We use this data to explore two outcomes of interest; (i) aggregate charitable contributions made by the respondent's household, and (ii) the amount donated by the respondent to selected charitable organizations in a modified dictator game. The survey was conducted in two waves, the first in December of 2017 and the second in May of 2018. The first outcome is derived from responses to a survey question asking the amount the individual's household had donated to charitable organizations in the prior year. The second outcome reflects how much of a subject's \$80-endowment was donated to charitable causes in a modified dictator game.

The lower panel of the table summarizes data gathered from the German Socio-Economic Panel (SOEP). The SOEP is a nationally representative longitudinal data set of households in Germany. The 2010 wave of the SOEP included questions about LOC beliefs along with information on five outcomes of interest; (i) aggregate charitable giving by the respondent's household, (ii) whether or not the respondent has made a blood donation in the last year/last ten years, (iii) in-kind giving to relatives or other individuals outside the respondent's household, (iv) giving by the respondent in a hypothetical dictator game, and (v) whether or not the respondent voted in the 2009 parliamentary elections.

Before proceeding, we should reiterate that the aim of study is to test whether there is a positive association between LOC beliefs and prosocial behavior. We have thus collected data on a variety of outcomes that include stated preference measures elicited via survey questions and revealed preference measures elicited in experimental games. While there are methodological concerns and empirical challenges when analyzing/interpreting any single piece of evidence, we advocate viewing the data and our results in its totality.⁵

⁵In this regard, our approach is similar to Porter and Zona (1993), who rely upon multiple tests to detect bid rigging in procurement auctions and base conclusions on the totality of the evidence.

Table 1: Overview of the included data sets

<i>forsa</i> panel			
Outcome	Green electricity	Environmental policy	Modified dictator game
Details	Respondent indicates whether or not the household has a Green electricity Tariff	Respondent indicates whether or not they are willing to pay an increase in a mandatory levy to subsidize renewable electricity generation	Share of respondent's endowment that is allocated to purchase carbon offsets in an incentivized modified dictator game
Country Data	Germany Revealed preference (Self-reported)	Germany Stated preference	Germany Revealed preference
Arizona Survey and Experiment			
Outcome	Charitable giving	Modified dictator game	
Details	Approximate amount donated to charitable causes by the household in the past year	Share of a respondent's endowment that is allocated to charity in an incentivized modified dictator game	
Country Data	U.S. Revealed preference (Self-reported)	U.S. Revealed preference	
German Socio-Economic Panel			
Outcome	Charitable giving	Blood donation	In-kind giving
Details	Approximate amount donated to charitable causes by the household in the past year	Whether or not the respondent has donated blood in the past 10 years / past year	Whether or not the respondent has made an in-kind gift to relatives or other individuals outside the own household
Country Data	Germany Revealed preference (Self-reported)	Germany Revealed preference (Self-reported)	Germany Revealed preference (Self-reported)
			Hyp. dictator game
			Voting
			Whether or not the respondent voted in the 2009 federal election

3.1 Measurement of Locus of Control

In all three data sets, LOC is measured using survey modules developed in the psychology literature. In the *forsa* data, LOC is elicited using the original items from the Psychological Coping Resources component of the Mastery Module by Pearlin and Schooler (1978). LOC in the Arizona data is measured using a subset of the I-E Scale by Rotter (1966). The SOEP uses a measure of LOC designed by Nolte et al. (1997), which is closely related to the I-E Scale by Rotter (1966). While these scales and the questions used to elicit LOC differ, they are designed to measure the same underlying concept and should provide similar proxies for an individual's control beliefs (Cobb-Clark and Schurer, 2013; Judge et al., 2002).⁶

The exact questions used to elicit LOC in the different data sets are described in Appendix A1. The appendix also describes how responses to the questions are coded and subsequently used in creating our LOC indices. As noted in the Appendix, there is a subtle difference in how LOC beliefs are elicited across the various data sets. In both the *forsa* and SOEP data sets, respondents are presented a series of statements and asked to express their level of agreement/disagreement with each using a 7-point Likert scale.⁷ In the Arizona survey, respondents are presented a series of six statement pairs and asked to select which statement best reflects their beliefs. In every pair, one of the statements represents an "internal" orientation and the other an "external" orientation.

An exemplary question used to elicit LOC beliefs in the *forsa* and SOEP data is the statement "I have little control over the things that happen to me". Stronger agreement with this statement reflects external beliefs. The mean response to this question was 2.7 out of 7 although there was slightly greater variability in responses in the SOEP data. An

⁶FigureA1 in the appendix shows the distribution of the normalized LOC indices for the four data sets used in our empirical analysis. As noted in the figure, the distributions of LOC beliefs across the different data sets are similar and statistically indistinguishable using a series of pairwise Kolmogorov-Smirnoff tests.

⁷Questions vary in whether agreement with the statement reflects an "external" or an "internal" orientation.

exemplary question pair in the Arizona data is the following, "What happens to me is my own doing" and "Sometimes I feel that I don't have enough control over the direction my life is taking". In this pair, the former statement reflect an "internal" orientation of beliefs whereas the later reflect an "external" orientation.

Tables A1 - A3 in the appendix summarize the raw response data for the LOC questions in each of our data sets.⁸ To create our final LOC index, we follow past work such as Becker et al. (2012) or Cobb-Clark et al. (2016) and create a standardized measure of LOC for each respondent. We do so by calculating the difference between the LOC score of an individual and the population mean LOC score for the respective data set and then divide this difference by the standard deviation for LOC scores in the data. This approach yields a common LOC index across the three different data sets and facilitates a common interpretation of our empirical results - estimated coefficients reflect the marginal effect of a one-standard deviation increase in the LOC index.

Figure 1 summarizes different moments of the distributions of our normalized LOC indices. As displayed in the figure, there are negligible differences in the distribution of indices across our various studies.⁹ Importantly, Figure 1 reinforces sentiment in (Cobb-Clark and Schurer, 2013; Judge et al., 2002) that the scales used in the different surveys capture the same underlying concepts and should produce similar distributions of normalized LOC beliefs.¹⁰

Before proceeding, it is important to note that our normalized LOC index reflects a generalized rather than context specific measure of beliefs; an important distinction given the aim of our study. Context-specific LOC measures are largely determined by subjective experience in the given context.¹¹ Our conceptual framework models the private provi-

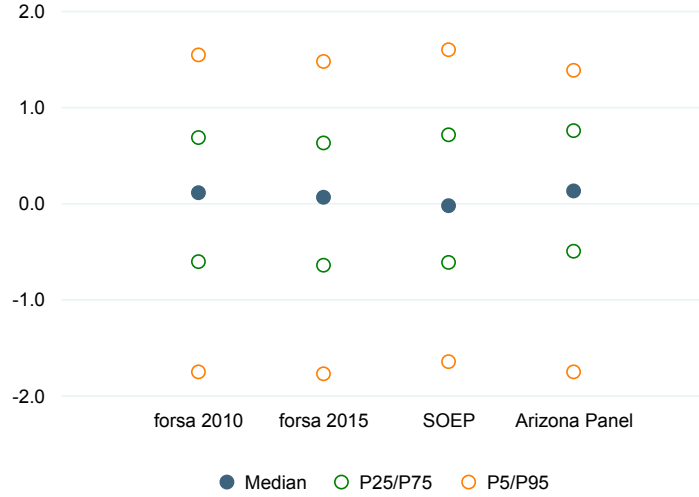
⁸In Table A1, we show that the mean response observed in the forsa data are similar to those observed in Cobb-Clark and Schurer (2013) who used an identical set of questions to elicit LOC beliefs.

⁹The distribution for the SOEP data is slightly more skewed with higher values for the 5th and 95th percentiles than the other three data sets. Similarly, we observe less variation between the 25th and 75th percentiles of the distribution for the Arizona data than in any of the other data sets.

¹⁰Figure A1 in the Appendix depicts the histograms of the standardized LOC indices for each data set.

¹¹Such measures have been used extensively in the environmental psychology literature to explore the determinants of pro-environmental behavior. For example, Cleveland et al. (2005) propose a measure of

Figure 1: Moments of the standardized LOC indices



sion of a generic (context neutral) public good. Predictions from the model regarding the effect of LOC beliefs on observed behavior should thus hold across a broad spectrum of prosocial acts. Hence, we believe it is appropriate to use a generalized measure of LOC rather than focusing on context specific beliefs.¹²

3.2 Empirical approach and interpretation

As a baseline specification, we regress each outcome of interest on the normalized LOC measure. Specifically, we estimate linear regressions of the form:

$$Y_i = a + b LOC_i + c X_i + e_i \quad (3)$$

where, Y_i is the outcome of interest for subject i and LOC_i is the standardized measure of LOC for subject i . In some specifications, the outcome of interest reflects a binary outcome

environmental LOC and investigate its relation to several forms of pro-environmental behavior. Similar approaches are taken, for instance, by Allen and Ferrand (1999) and Kalamas et al. (2014).

¹²An added benefit of using a generalized measure of LOC is that they are relatively stable over one's lifetime and reflect beliefs across a variety of domains (Rotter, 1975; Boone and De Brabander, 1993; Cobb-Clark and Schurer, 2013). Context specific beliefs, in contrast, are mutable over one's lifetime as they reflect experiences and beliefs within a narrowly defined domain.

such as whether or not a respondent states to have a green electricity tariff. In other specifications, the outcome of interest reflects a continuous measure such as the amount of money contributed to charitable causes in the past year.¹³ The coefficient estimate on our standardized measure of LOC, \hat{b} , reflects the marginal effect of a one-standard deviation increase in the LOC index – i.e., it captures the effect of a one-standard deviation increase in the internal nature of one’s beliefs.

Unconditional correlation estimates may capture not only the influence of LOC beliefs, but also confounding factors that are correlated with both LOC beliefs and the outcome of interest. For example, individuals with a high internal LOC tend to have better educational and labor market outcomes (Coleman and DeLeire, 2003; Cobb-Clark, 2015), both of which have been shown to affect prosociality (Bekkers and Wiepking, 2011; Wiepking and Bekkers, 2012).¹⁴ We thus augment our baseline specifications and estimate conditional correlations that include a variety of socio-economic characteristics that may be correlated with both control beliefs and prosocial behavior – employment status, income, and education – as control variables. As the full set of demographic controls is not available for every survey respondent in the different samples, we also present results for our baseline specification excluding those individuals with missing demographic controls. In all specifications, we report robust standard errors.

Before proceeding we want to address concern that our estimates might capture spurious patterns due to reverse causality. For example, in a labor market context, Preuss and Hennecke (2018) argue that LOC beliefs decrease when an individual becomes unemployed. Such feedback effects could confound analyses investigating the effect of LOC beliefs on job search and labor market outcomes. In our setting, however, feedback effects on LOC beliefs are unlikely. Individual contributions to the different public goods

¹³For both outcome types, we estimate the model using OLS. Hence, for binary outcomes, we estimate the model using a linear probability model. Our findings, however, are robust to the use of a logit specification and results from such models are available upon request.

¹⁴Omitted variable bias from these factors is positive as they are positively correlated with more internal locus of control beliefs and with higher prosociality. We thus argue that our specification without control variables identifies an upper bound for the effect of LOC on prosociality.

considered in our study should have negligible impact on aggregate provision levels and subsequent real income levels. Further, as shown in Cobb-Clark and Schurer (2013), feedback effects of life events on generalized measures of LOC are small and economically insignificant. It is thus unlikely that our estimates capture feedback effects or spurious correlation due to reverse causality.

4 Empirical Results

We next summarize the data collected from the various sources and present econometric estimates of the association between LOC and our outcomes of interest. We begin by describing how the data were collected and the questions used to elicit the various outcomes of interest. We then summarize the empirical findings using figures that display estimated effect sizes and associated 95 percent confidence intervals. We present this information for each of the three data sets in distinct subsections.

4.1 The *forsa* panel

The data for our first three outcomes of interest were gathered from two different surveys conducted in Germany in collaboration with the survey institute *forsa*. *Forsa* maintains a household panel that is representative of the German-speaking population aged 14 and above and utilizes a state-of-the-art tool that allows respondents to fill out questionnaires through either a television, smart phone, or computer.¹⁵ Moreover, the tool allows respondents to interrupt and continue the questionnaire at any time.

The first survey was conducted in 2015 with the aim of understanding attitudes towards green energy and eliciting the willingness to pay for the development of renewable energy sources within Germany. The data set includes responses from 7,077 individuals and contains two outcomes of interest: (i) the willingness to take voluntary

¹⁵Additional information about the panel is available at www.forsa.com.

action to reduce greenhouse gas emissions and (ii) the willingness to support collective (public) action to mitigate greenhouse gas emissions. To elicit these measures we asked survey respondents the following questions:

(i) Do you receive your electricity from a green electricity provider or did you choose a green electricity tariff?

(ii) Would you be willing to pay an additional x cents on the per Kilowatt hour levy in order to reach the target of 35 percent renewable energy by 2020?

To assist in answering the first question, respondents were provided a list of green electricity providers and an example of a green electricity tariff from a conventional supplier. Before asking the second question, we provided respondents information about the current levy and the national target for renewable electricity supply.¹⁶ To elicit WTP, respondents were randomly assigned one of three different values – 1, 2, or 4 cents per kWh – for the hypothetical increase in the levy.¹⁷

The second survey was conducted in 2019 with the aim of understanding attitudes towards climate policy and emissions from the transportation sector, specifically passenger cars. A subset of 1,845 respondents participated in a modified dictator game that offered the opportunity to purchase carbon offsets through the non-profit organization Atmosfair.¹⁸ The modified dictator game was implemented as follows. First, participants were informed that they would be provided a €100 endowment and would have to decide

¹⁶While the survey was conducted, producers of green electricity in Germany receive fixed feed-in tariffs that are financed via a coercive per Kilowatt hour levy of electricity referred to as the EEG levy. At the time of the survey, the levy amounted to 6.24 ct/kWh or about one-quarter of the price for a residential consumer.

¹⁷The survey contained two different methods to elicit the acceptance of the levy increase (see Andor et al., 2021). Half of the respondents received the binary choice question with $x \in [1, 2, 4]$ cents per kWh, while the other half received an open-ended question that asked the maximum increase in the levy that they would be willing to accept. We follow Balistreri et al. (2001) and transform the open-ended answers into a dichotomous response by randomly assigning every respondent one of the three bid amounts. We then generate a binary indicator that equals one if the respondent's stated maximal increase in the EEG levy exceeds the randomly assigned value.

¹⁸For more information, see <https://www.atmosfair.de/en/>.

how much of this endowment to keep for themselves and how much (if any) they would like to allocate to the purchase of carbon offsets. We then provided examples of projects supported by Atmosfair and information on the CO₂-intensity of various everyday activities.¹⁹ Finally, subjects proceeded to the elicitation screen where they used a slider to indicate how much of their €100 endowment they would like to use to purchase carbon offsets.²⁰ Our third outcome of interest in the *forsa* data is the amount allocated to the purchase of carbon offsets in the modified dictator game.

Table A5 in the Appendix presents summary statistics for the *forsa* data. Approximately 22 percent of all respondents report having a green electricity tariff or purchasing electricity from a green provider. A substantially larger fraction of respondents, approximately 49 percent, indicate a willingness to pay an increased levy to support greater capacity for green electricity. Support for the levy ranges from 33 to 61 percent and is inversely related to the underlying price increase per kWh. In the modified dictator game, subjects allocated an average of €65.1 to the purchase carbon offsets.

We observe the full set of demographic characteristics for approximately 83 percent of the 2015 sample and 94 percent of the 2019 sample. The majority of the missing information reflects respondents who were unwilling to report monthly household income. Comparing demographics across survey waves, we find that respondents in the second wave were (i) younger, (ii) more likely to be female, and (iii) reported higher monthly earnings.²¹ As such demographics have been shown to correlate with generosity and prosocial behavior, we would expect a greater difference in the estimated effect size across specifications with and without demographic controls when exploring the association amongst LOC beliefs and the purchase of carbon offsets.

¹⁹In the survey, we emphasized that Atmosfair is under the patronage of a former German federal environment minister and received the highest rating possible from the popular German consumer organization *Stiftung Warentest*.

²⁰To make decisions consequential, participants were informed that there was a 1 in 100 chance that their allocation would realized. As shown by Charness et al. (2016) and Clot et al. (2018) this payment protocol leads to results that are similar to those that would be expected if all subjects were paid.

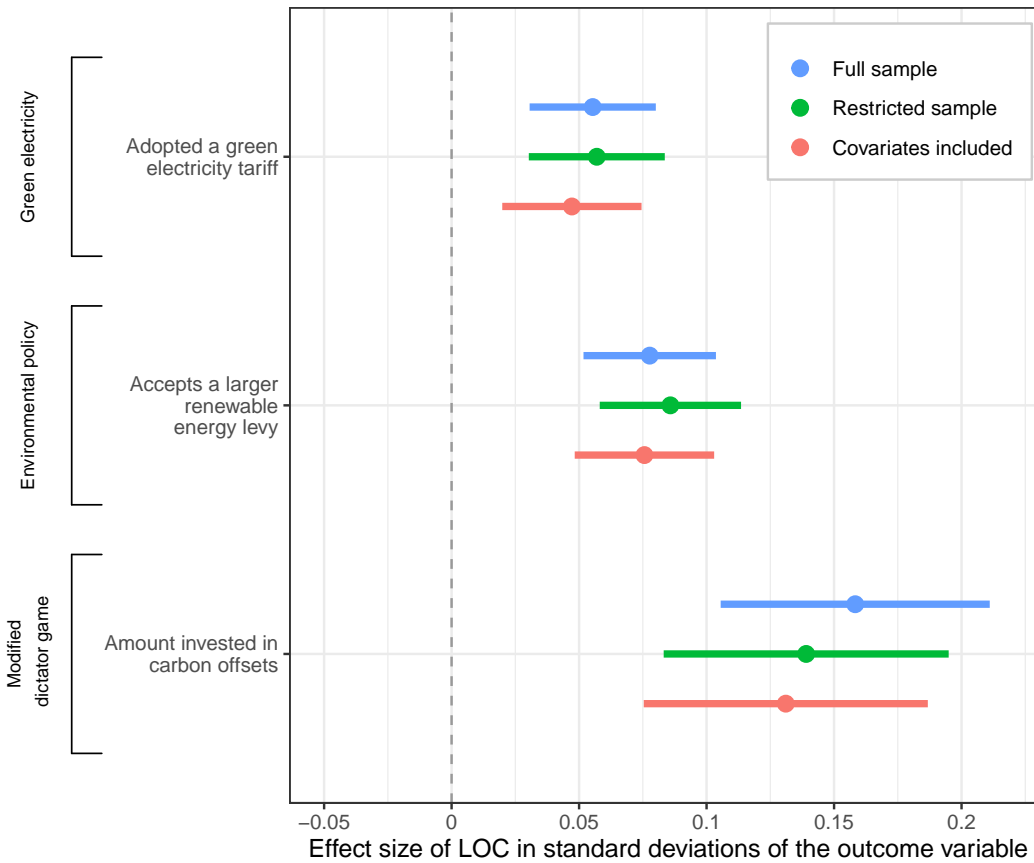
²¹Adjusted for inflation rates over this period, the difference in monthly real wage across the samples is around 4.6 percent.

Figure 2 shows the association between LOC and our three outcomes of interest by plotting estimated effect sizes and the associated 95 percent confidence intervals for a one-standard deviation increase in our normalized measure of LOC. The figure presents these estimates for three different specifications of our econometric model - the full sample without demographic controls, a restricted subset of the sample that includes demographic controls, and this same restricted subset but without demographic controls. Table A6 and Table A7 in the Appendix report the full set of parameter estimates for the specifications depicted in Figure 2. The tables differ in that Table A6 reports estimates converted into effect sizes whereas Table A7 reports estimates in absolute levels.

As displayed in the figure, there is a positive association between LOC beliefs and public good provision; respondents with internal control beliefs are more likely to act in a prosocial manner. Moreover, the results presented in Figure 2 show that our findings are unlikely to reflect omitted variable bias or a spurious correlation between LOC and prosocial behavior. For all three outcomes, the estimated effect sizes are smaller when we restrict the sample and include demographic controls. For example, as noted in the bottom panel of the figure, the effect size for a one-standard deviation increase in LOC on allocations to carbon offsets falls from 0.158 to 0.131 when we include demographic controls.²² However, the observed differences in effect sizes across our different specifications are not statistically or economically significant at meaningful levels.

²²Consistent with the observed differences in demographics across the first and second waves of the experiment, the inclusion of demographic controls has a greater impact on the estimated effect size for the purchase of carbon offsets than for acceptance of an increased levy or the purchase of green electricity.

Figure 2: *forsa* panel - OLS estimates



Note: Each marker represents the point estimate of LOC^{stand} on the respective standardized outcome. The whiskers represent the 95% confidence intervals.

Exploring the resulting effect sizes, a one standard deviation increase in the LOC index is associated with an approximate 0.05 standard deviation increase in the probability the household has adopted a green electricity tariff/purchase electricity from a green provider. Given baseline adoption rates, this corresponds to an approximate two percentage point increase in the likelihood of having a green electricity tariff or provider.²³ To put these effects into perspective, a one standard deviation increase in LOC beliefs for every

²³We would also refer the interested reader to the first three columns of (Table A7) which reports parameter estimates in levels as opposed to effect sizes. As noted in the first three columns of the table, a one standard deviation increase in LOC increases the likelihood of having a green electricity tariff by 2 to 2.4 percentage points.

German would lead to an increase the number of households with a green energy tariff/producer in excess of 800,000 (or around 2 percent of the total number of households in the country).²⁴

The middle panel of Figure 2 displays the association between LOC and the willingness to accept higher levies to finance increased capacity for renewable energy. A one standard deviation increase in LOC leads to an approximate 0.08 standard deviation increase in the probability of accepting a higher levy.²⁵ Translating these effects into levels, a one standard deviation increase in LOC is associated with an approximate four percentage point increase in the likelihood of accepting a higher levy to support the development of new renewable energy sources. Given average energy consumption in Germany of approximately 3,100 kWh per year, the estimated effects correspond to an approximate €3 increase in the expected per household levy.²⁶ Extrapolating this to the population at large, our findings suggest an additional €125 million that could be allocated to the production and maintenance of green energy.

Finally, as displayed in the bottom panel of Figure 2 a one standard deviation increase in our normalized LOC index is associated with a 0.13 standard deviation increase in the amount allocated to carbon offsets in the modified dictator game. Translating this effect into monetary values yields additional €4.6 or an approximate 7.5% increase compared to the mean offset of €61.5.²⁷ Scaling this effect to the 48 million registered car owners in Germany, our estimates imply that the purchase of carbon offsets would increase by approximately €221 million. For perspective, this is enough to offset more than 9.6 million tons of CO₂ – or the annual carbon footprint of approximately 2.1 percent of the

²⁴Given that there are a number of barriers to the adoption of green electricity tariffs - e.g., limited knowledge and awareness of green tariffs (Hobman and Frederiks, 2014; He and Reiner, 2017), default effects that favor conventional providers (Ebeling and Lotz, 2015; Sunstein and Reisch, 2014) and consumer inertia Hortaçsu et al. (2017), the association between LOC and green electricity is particularly noteworthy.

²⁵The full set of parameter estimates for these models are reported in columns 4 through 6 of Table A6 in the Appendix.

²⁶Data on average energy consumption is for 2018 and is available at <https://www.destatis.de/DE/Themen/Gesellschaft-Umwelt/Umwelt/UGR/private-haushalte/Tabellen/stromverbrauch-haushalte.html>

²⁷Columns VII-IX in Appendix Table A7 report the estimated marginal effects in Euros.

households in Germany.²⁸

An important question is how our estimates compare to prior work. Admittedly, the effects we estimate are smaller than those documented in prior work exploring the effects of defaults for green electricity Ebeling and Lotz (2015) or carbon offsets Araña and León (2013). However, our estimates are comparable to those documented in Kesternich et al. (2016) who show that the introduction of a 3:1 match rate lead to an approximate 13 percent increase in the amount customers allocate to the purchase of carbon offsets when buying bus tickets through an online portal.

4.2 The Arizona Project

The data for the next set of outcomes is drawn from a project that was designed to explore the effect of a state level tax credit for contributions to select charitable causes. Data for the project were collected across two waves via an online survey and experiment conducted in collaboration with Qualtrics. The first was conducted in December of 2017 and the second in late April to early May of 2018. Participants were recruited through Qualtrics' network of local panel providers and were selected to reflect a representative sample of adult residents in the state of Arizona. The final data set includes information on more than 900 participants.²⁹

Data from the project provide two measures of charitable giving. The first measure captures aggregate giving by the respondent's household over the past year and was elicited using the following question:

(i) Approximately how much have you or your family donated to charity in the past 12 months?

²⁸The above calculation is based upon Atmosfair's assumed carbon price of €23 per ton and average carbon emissions of around 11,000kg per household.

²⁹We refer the interested reader to Chatterjee et al. (2020) for a more detailed description of the survey and experiment.

The second measure reflects contributions made in a two-stage, modified dictator game whereby subjects decided how to allocate an \$80 endowment amongst themselves and a set number of causes selected as recipients in the first-stage of the game. Choices for every subject were consequential – donations were sent to the selected organizations and the remainder of the endowment was paid to the subject as earnings for the experiment.

Summary statistics are provided in Table A8. For each outcome, we explore choice along two margins of interest - the probability of donating (the extensive margin) and the amount donated (the intensive margin). As noted in the Table, approximately 81 percent of subjects donated to a cause selected as a recipient in the modified dictator game. The average amount shared with selected recipients was just under \$ 50 or approximately 62 percent of a subject's endowment. We observe a similar frequency of giving over the past year; 87 percent of all participants reported donating to at least one charitable cause in the past year and the average aggregate contribution amount was approximately \$ 1,930 per household.³⁰

We observe demographic data for every survey respondent in our sample. Slightly more than half of our respondents (53 percent) are female and more than half of our sample has a college degree or higher. The modal income for subjects in the sample was between 100 - 150K although nearly 12 percent of our sample report annual income below the federal poverty line for a family of four. The modal age bracket for respondents in the survey is 65 and up with less than 20 percent of the sample being under the age of 35.

Figure 3 displays the association between LOC and our four outcomes of interest by plotting estimated effect sizes and the associated 95 percent confidence intervals for a one-standard deviation increase in our normalized measure of LOC. As we observe demographic data for the full sample, the figure shows this interval for two different specifi-

³⁰Data on giving over the past year was not reported by 38 respondents (or just over 4 percent of our sample). Summary statistics reported in Table A8 are based on the subset of 866 respondents who answered the questions on giving during the past year.

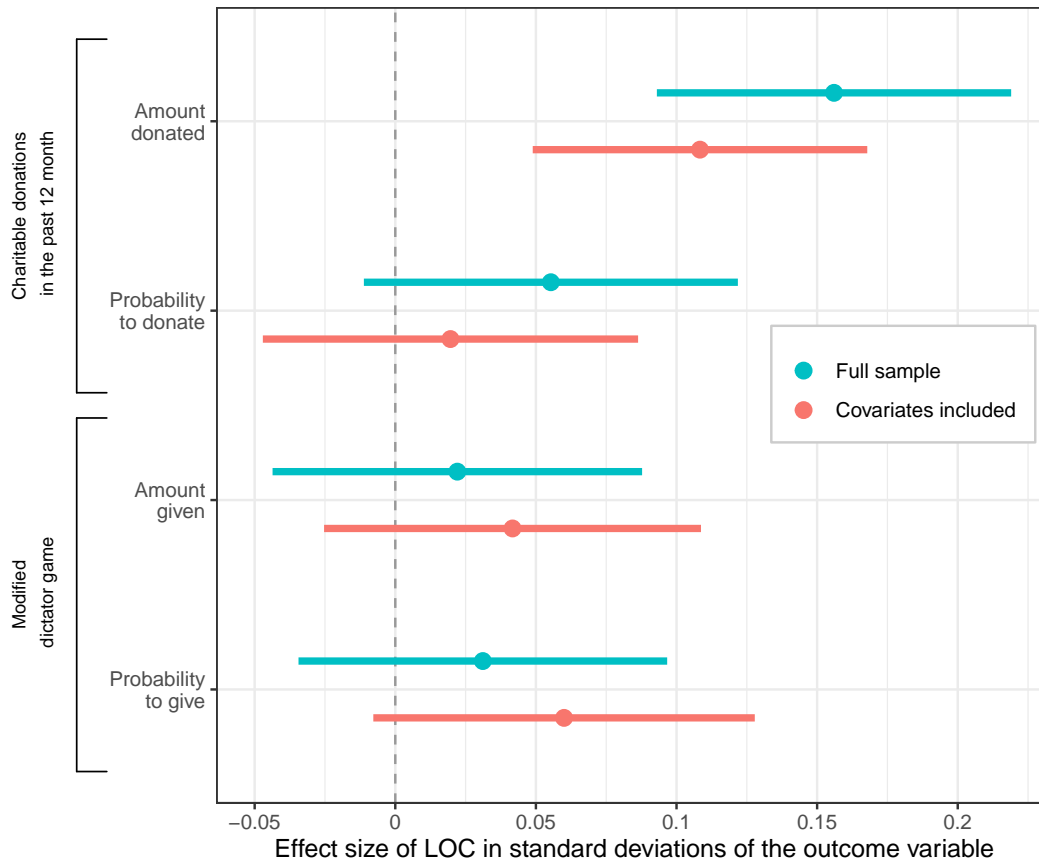
cations of our econometric model – one with and the other without demographic controls. Table A9 in the Appendix reports the full set of parameter estimates for the models displayed in Figure 3 while Table A10 reports the parameter estimates in levels.

We again observe a positive association between LOC beliefs and prosocial behavior; respondents with internal beliefs are more likely to donate and provide larger gifts than counterparts with external beliefs. For example, a one standard deviation increase in LOC beliefs is associated with an approximate 0.05 standard deviation increase in the probability that the household indicated that they had donated to at least one cause in the past year and more than a tenth of a standard deviation increase in the overall amount donated. However, this relationship is only statistically significant when exploring the association between LOC beliefs and the amount donated in the past.

To put these effects into perspective, a one standard deviation increase in LOC corresponds to increased donations of \$ 278 per household – or approximately 18.6 percent of the mean contribution level. Scaled to the U.S. population of nearly 130 million households, a one-standard deviation increase in LOC would be associated with a \$36 billion increase in the overall amount donated or an approximate 8 percent increase in total giving for 2009 (Giving USA, 2020).

We observe a smaller, and statistically insignificant, association between LOC beliefs and behavior in the modified dictator game. While both the propensity to give and average allocations are increasing in LOC beliefs, neither relationship is economically meaningful. For example, a one-standard deviation increase in LOC beliefs is associated with less than one-twentieth of a standard deviation increase in the average amount donated. This corresponds to an approximate \$1.31 increase in the amount shared with selected causes or approximately one-fifth of the estimated difference in giving amongst women and men in the experiment.

Figure 3: Arizona Project - OLS estimates



Note: Each marker represents the point estimate of LOC^{stand} on the respective standardized outcome. As there are no observations with missing control variables in the Arizona Project, there is no need to distinguish between the full sample and the restricted sample here. The whiskers represent the 95% confidence intervals.

Before proceeding, it is important to note a few features of the Arizona project that could explain the weak association amongst LOC beliefs and observed patterns of giving – particularly that observed in the modified dictator game. First, LOC beliefs in the Arizona data were elicited using a series of six dichotomous choice questions rather than a larger set of questions answered using a multi-point Likert scale. As noted in Figure A1, there is significantly less variability in the standardized LOC index for the Arizona project than in the other data sets. Moreover, the sample size for the Arizona project is substantially smaller than that observed in the remaining data sets. Taken jointly, we would thus

expect less precision when exploring the association between LOC beliefs and outcomes of interest from the Arizona data.

Second, every cause that could be selected as a recipient in the modified dictator game provided basic services – e.g., health care, temporary shelter and clothing, or prepared meals and groceries – to low income residents in the state.³¹ There is a large body of literature in social psychology showing that individuals are less likely to help others whose need for assistance was perceived to be controllable (Schopler and Matthews, 1965; Simmons and Lerner, 1968; Weiner, 1985; Schmidt and Weiner, 1988; Weiner et al., 1988; Skitka and Tetlock, 1992; Graham et al., 1993; Marjanovic et al., 2009; Higgins and Zumbo, 2019).³² A related body of literature shows that such reaction is stronger for internals and those who tend to attribute others’ negative outcomes to personally controllable causes (Higgins and Shaw, 1999; Lundquist et al., 2002; Higgins and Zumbo, 2019). To the extent that the services provided by charities in the Arizona project address needs that are perceived to be controllable, they are unlikely to appeal to those with internal beliefs which could attenuate the association between LOC and charitable giving.

4.3 The German Socio-Economic Panel

The data for our final analysis stems from the 2010 wave of the German Socio-Economic Panel (SOEP), a publicly available, nationally representative, longitudinal data set on private households in Germany.³³ The 2010 wave includes information on five outcomes of interest: charitable donations, blood donations, in-kind giving, giving in a dictator game, and voting. Summary statistics are presented in Table A11 of the appendix.

³¹The focus on such a limited set of causes reflects the original intent of the experiment to explore the impact of tax credit for giving to select causes on aggregate patterns of giving and the allocation of funds across causes. As such, the set of potential recipients reflected a mix of qualifying organizations and non-qualifying causes that provide similar services.

³²For example, Skitka and Tetlock (1992) summarizes findings from this literature as follows, “...research on attributions and helping point to one clear-cut conclusion: People are least likely to help victims whose need is attributed to internal-controllable causes...carelessness, laziness, greed....”

³³Additional information on the panel is available online at www.diw.de/en/diw_01.c.600489.en/about.html.

The 2010 wave of the SOEP includes information for 26,974 unique respondents - all of whom provided basic demographic information such as age and gender. Unfortunately, we are only able to use a subset of this sample in our final analysis due to missing information on either LOC or an outcome of interest. For example, less than 69 percent of the respondents answered the questions used in deriving our LOC index. We observe further reductions in sample size due to missing or invalid responses to the questions used to elicit our outcomes of interest.

Our first outcome of interest in the SOEP data focuses on charitable donations which were elicited using the following two questions:

(i) We now have a question about donations. By donations we mean giving money for social, church, cultural, non-profit and charitable purposes without receiving any direct consideration. These can be larger amounts, but also smaller ones, which can be put into a collection box. We also include the collection in the church. Did you donate money last year, in 2009 – membership fees not included?

If the respondent indicated that they had made a contribution in the past year, they were subsequently asked:

(ii) What was the total amount you donated last year?

We use response to these questions to explore behavior along two margins of interest, the likelihood of giving (extensive margin) and average donation amounts (intensive margin). As noted in the second panel of Table A11, the data contain 16,716 valid responses about charitable giving.

Donations are highly skewed and include a number of extreme values. To minimize the influence such extremes, we trim the estimation sample at the 99th percentile of the

distribution for donations. For the trimmed sample, approximately 41 percent of respondents reported that they made a charitable donation in the past year and the average contribution was €66.2 per respondent. After dropping observations with missing information on LOC and/or key demographics, the resulting estimation sample includes 16,113 observations for the specification without demographic controls and is reduced by 1,575 when we restrict the analysis to those respondents for which we observe the full set of demographic controls.

Our second outcome of interest is blood donations and was elicited using two questions:

(i) There are also donations that are not of a financial nature, for example blood donations. Have you ever donated blood in the past 10 years?

(ii) Did you once donate blood last year?

There are a number of medical reasons that would preclude an individual from donating blood. To account for such possibility, subjects were also asked if there were medical reasons why they could not donate blood. We exclude from the estimation sample respondents who answered affirmatively (~21%) to this question. After making these adjustments, we observe data on blood donations for 13,319 respondents.

Approximately 18 percent of this sample report that they had donated blood in the past 10 years. If we restrict attention to blood donations in the past year, the proportion of donors falls to 9 percent of all respondents. After dropping observations with missing data, the resulting estimation sample includes 13,023 individuals for models without demographic controls and falls by just under 11 percent when we exclude observations with missing demographic controls.

Our third outcome of interest captures in-kind giving which was elicited using the following question:

(i) Private support can be provided in the form of benefits in kind, e.g. clothing, gifts, vacation, or restaurant visits. Did you personally provide in-kind support last year, in 2009, to relatives or other individuals outside your household?

As noted in the middle panel of Table A11, approximately 15 percent of respondents report that they provided in-kind support in the past year. After dropping observations with missing data, the estimation sample for models without demographics includes 18,284 individuals and is reduced by 10.5 percent when we exclude observations with missing demographic controls.

As a fourth measure of interest captures sharing in a hypothetical dictator game and was elicited using the following question:

(i) Imagine that you unexpectedly received a gift of €10,000. How would you use this money? How much would you save, how much would you give away, and how much would you spend?

We use the response to this question to generate two outcomes of interest - the likelihood of sharing the windfall with others and the overall amount shared. We observe dictator game giving for 10,567 respondents. Amongst these, approximately 70 percent indicated that they would share the windfall with others and the average amount shared was €2,132. After dropping observations with missing covariates, the final estimation sample includes 10,234 observations for the model without demographics and is reduced by approximately 9 percent when restricted to observations with the full set of demographic controls.

Our final outcome of interest captures voting and was elicited by asking the following question:

(i) Did you vote in the last election to the German Bundestag on September 27, 2009?

We observe voting behavior for over 23,000 respondents - approximately 80 percent of whom reported voting in the 2009 federal election. Due to missing covariates, the final estimation sample includes 15,576 observations in our baseline specification. The sample is reduced by an additional 1,431 observations when we restrict the analysis to the subset of individuals for whom we observe the full set of demographics.

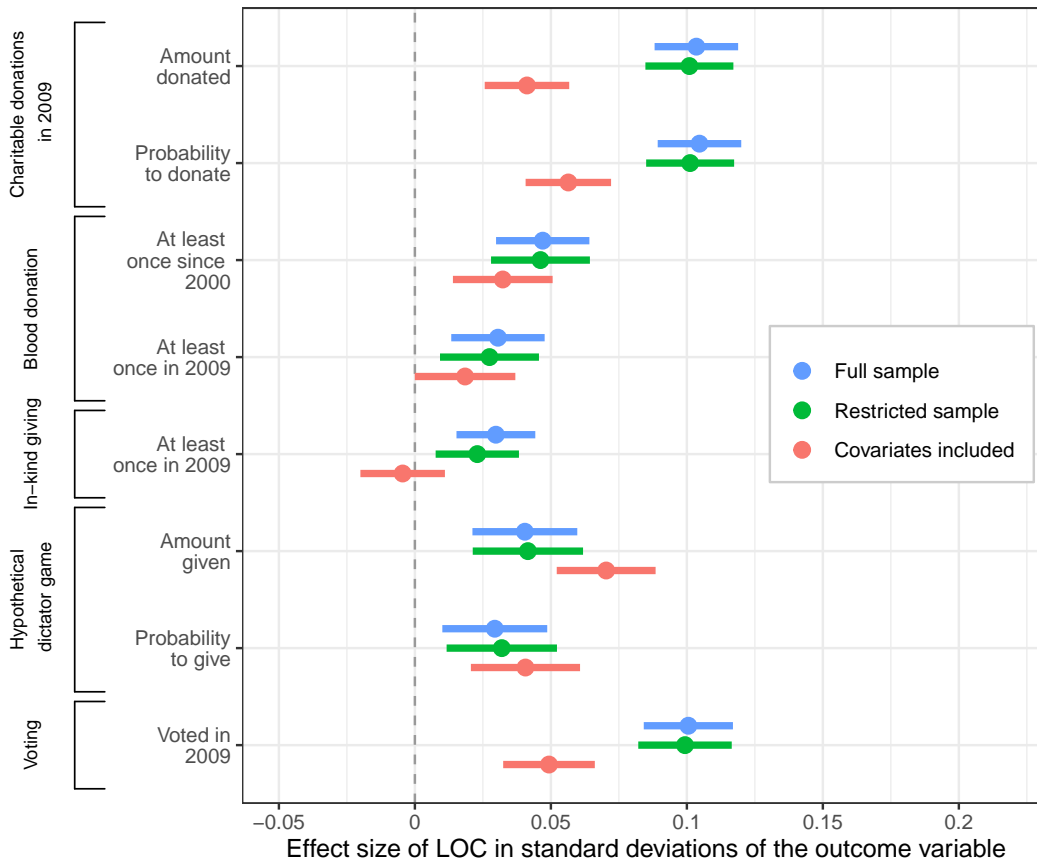
Figure 4 depicts the estimates and associated 95 percent confidence intervals for the standardized effects across eight distinct outcomes of interest; (i) charitable contributions in 2009, (ii) the probability an individual made a charitable contribution in 2009, (iii) the probability of donating blood in the past 10 years, (iv) the probability of donating blood in the past year, (v) the probability of making an in-kind gift in 2009, (vi) the amount shared with others in the hypothetical dictator game, (vii) the probability the individual said they would share with others in the hypothetical dictator game, and (viii) the probability that the individual voted in the 2009 federal election. For each outcome, we depict effect sizes for each of our three econometric specifications. The underlying econometric estimates are presented in Table A12 and Table A13 of the Appendix.

As displayed in Figure 4, there is a positive association between LOC and both the likelihood the respondent's household made a charitable contribution in the past year and the associated amount donated. Controlling for demographics, a one standard deviation increase in our LOC index is associated with an approximate 0.06 standard deviation increase in the likelihood the household reported a donation in the past year and a 0.04 standard deviation increase in the amount donated. Converting these effects into levels, the estimated effects correspond to an approximate 2.8 percentage point increase in the likelihood of giving and a €7 (or 9.8 percent) increase in total donations.³⁴

³⁴Estimates in levels are presented in Tables A14 and A15 of the Appendix.

For perspective, we compare the estimated association between LOC and charitable giving and the effect of different fund-raising strategies designed to trigger psychological motives for giving. Overall, our estimates are comparable to past work exploring the effect of identity primes Kessler and Milkman (2018) and targeted appeals that emphasize benefits to self List et al. (2019). However, the relative rankings depend on the underlying margin of choice. We observe a larger impact along the extensive margin, whereas the prior work finds a larger impact on average contributions (the intensive margin).³⁵

Figure 4: SOEP - OLS estimates



Note: Each marker represents the point estimate of LOC^{stand} on the respective standardized outcome. The whiskers represent the 95% confidence intervals.

³⁵For example, Kessler and Milkman (2018) finds an approximate 1.7 percentage point increase in the likelihood of giving and a 22.8 percent increase in average contributions. List et al. (2019) finds less than a one percentage point increase in the likelihood of giving but more than a 23 percent increase in average contribution levels.

We observe a similar correlation amongst LOC and pro-sociality as measured by allocations in the hypothetical dictator game and in-kind donations. For example, in the hypothetical dictator game, a one standard deviation increase in LOC is associated with a 0.04 standard deviation increase in the likelihood of giving and a 0.07 standard deviation increase in the amount shared. For perspective, these effects correspond to an approximate 1.9 percentage point increase in the likelihood of sharing and a €174 increase in the amount shared. The association between LOC and in-kind giving is significantly less pronounced when we include demographic controls.

We next explore the association between LOC and blood donations. A one standard deviation increase in the LOC index is associated with a 0.03 standard deviation increase in the likelihood the respondent donated blood in the past 10 years and a 0.02 standard deviation increase in the likelihood the respondent donated blood in the past year. As noted in Table A14, the latter effect corresponds to an approximate 0.5 percentage point increase in the probability an individual gave blood in the past year. Given that around a third of the German population is eligible to give blood, a one standard deviation increase in LOC would result in more than 135,000 additional donors nationwide.³⁶

To put these findings into perspective, our effect sizes are significantly smaller than those observed in prior work exploring the effect of providing donors thank you gifts Lacetera et al. (2012) or lottery tickets Goette and Stutzer (2020). For example, Lacetera et al. (2012) show that providing potential donors thank you gifts such as mugs, T-shirts, or jackets lead to an approximate 15 percentage point increase in the number of donors. Goette and Stutzer (2020) find that offering potential donors a lottery ticket worth around €5 leads to an approximate 5.6 percentage point increase in the likelihood of donating.

Finally, we observe a positive relation between the LOC and voting; conditioned on demographic controls, a one standard deviation increase in the LOC is associated with an

³⁶Given the demographic changes occurring in Germany, such an effect is particularly noteworthy as the demand for blood donations is expected to increase, while its supply is expected to decline over the next few decades (Schönborn et al., 2017).

approximate 0.05 standard deviation (or a 1.8 percentage point) increase in the likelihood the respondent voted in the 2009 federal election. As there are approximately 65 million eligible voters in Germany, our estimated effects suggest that a one standard deviation increase in LOC would be associated with an increase in voter turnout of more than 1 million voters.

For perspective, the effect sizes found in our study fall within the range of effects identified in past work exploring voting behavior. For example, DellaVigna and Kaplan (2007) show that the introduction of Fox News in the US cable market lead to an approximate 2 percentage point increase in voter turnout. Gerber et al. (2008) find a 2 to 8 percentage point increase in turnout when voters are sent a letter than includes social information. (Rogers et al., 2016; DellaVigna et al., 2017) detect effects in the range of 0.7 to 1.3 percentage points when informing potential voters that they may be asked after an election whether or not they voted.

4.4 Putting the Findings Into Perspective

A natural question is whether the associations we identify are plausible. To address this question we compare our estimated effects to those from other studies exploring the effect of LOC on a variety of private behaviors - e.g., job search, educational attainment, and technology adoption. We restrict the comparison to studies that (i) consider multiple outcomes, (ii) use a standardized measure of LOC, and (iii) report results as effect sizes or allow for the calculation of such. The table should thus not be viewed as a comprehensive review of the literature. Rather, the selected studies should be viewed as illustrative examples of the range of private behaviors that are influenced by LOC.

For each study, we calculate the average of the standardized effect sizes across all outcomes and report the underlying range of estimates from which the average effect size was derived. The estimates are in Table 2 and can be read as follows. The average effect size in our study was 0.069 while the individual effect sizes used to calculate this

Table 2: Summary of the regression results with standardized outcome variables and comparison to the literature

	Mean over all std. coefs.	Effect range
Prosocial behavior (summary of our results)	0.069	[-0.004 – 0.158]
Healthy habits (Cobb-Clark et al., 2014)	0.029	[-0.041 – 0.084]
Weekly job search hours (McGee, 2015)	0.046	[0.038 – 0.054]
Educational attainments (Coleman and DeLeire, 2003)	0.070	[-0.012 – 0.219]
Technology adoption by Ethiopian farmers (Abay et al., 2017)	0.089	[0.045 – 0.202]
Probability to own financial equity (Salamanca et al., 2020)	0.111	[0.051 – 0.157]

average range from -0.004 to 0.158.³⁷

The average effect size in our study accords well with past work. The average standardized effect sizes in the five studies summarized in Table 2 range from 0.029 to 0.111. For example, our average effect size is qualitatively similar to that from Coleman and DeLeire (2003) exploring the relationship between LOC and educational outcomes but significantly smaller than those observed in studies exploring the relationship between LOC and technology adoption Abay et al. (2017) and the ownership of financial equity Salamanca et al. (2020).

Considering the range of individual effect sizes, results from our study accord similarly well with this past literature. For example, both Cobb-Clark et al. (2014) and Coleman and DeLeire (2003) report effect sizes that are less than the smallest effect size (-0.004) found in our study. While, (Abay et al., 2017) and (Salamanca et al., 2020) report effect sizes that are bigger than the largest effect size (0.158) identified in our study.

³⁷The smallest effect size reported in our study captures the relationship between LOC beliefs and in-kind giving while the largest effect size reported in our study captures the association between control beliefs and the purchase of carbon offsets.

5 Conclusion

Starting with Andreoni (1989), there has been a rich literature discussing the motives for prosocial behavior and the private provision of public goods. We extend this literature by positing that locus of control beliefs provide a psychological underpinning for the two most commonly studied motives for giving – pure and impure altruism. Using both primary and secondary data from Germany and the United States, we show that individuals with a high internal LOC are more prosocial as measured by a variety of acts - e.g., contributions to climate change mitigation and charitable organizations, sharing with others, blood donations, and participation in parliamentary elections.

Our results offer a complementary view on public good provision that goes beyond free-ridership and the “Warm-Glow of Giving” (Andreoni 1989): Individuals differ in their beliefs about the consequences of their actions and such beliefs, in part, determine their willingness to privately provide public goods. As such, differences in LOC beliefs may lead to heterogeneity in the perceived marginal benefits associated with any given level of public good provision. From a policy perspective, recognizing such heterogeneity is important as it can, for example, justify the use of minimum standards rather than price instruments as an optimal policy when the cost of public good provision are convex (Jacobsen et al., 2017).

Our study advances control beliefs as a psychological foundation for altruistic motives. It is thus natural to question whether our findings would generalize to other settings - e.g., voting in South America or gifts of time (volunteer work) in India or Qatar. There is a growing body of literature exploring the external validity and scalability of empirical findings (e.g., Al-Ubaydli et al., 2017a;b; Dehejia et al., 2019; Vivaldi, 2020). A fundamental insight from this literature is the importance of replication to explore whether/how results vary across studies that utilize different populations, methods, or situations (Maniadis et al., 2014; Dreber et al., 2015). A strength of our study is that inference is based upon results from four distinct data sets that rely upon different popu-

lations and methods to elicit measures of prosocial behavior. For example, the *forsa* data sets use a combination of survey questions, a hypothetical discrete choice experiment, and a revealed preference allocation task to elicit the willingness of subjects to invest in climate change mitigation. Yet, future work should explore whether our results extend to other cultures. For example, there may be moderating factors and boundary conditions across societies that dampen the influence of control beliefs on altruism (Henrich et al., 2010).

A related concern centers around the interpretation of our findings. Our analysis documents an association between LOC beliefs and prosocial behavior. Although LOC beliefs are considered stable in adulthood (Cobb-Clark and Schurer, 2013), a natural question is whether the observed relationship is causal and whether attempts to influence LOC beliefs during youth would foster increased prosociality later in life. Given evidence that LOC beliefs can be influenced during youth (Roberts and DelVecchio, 2000; Roberts et al., 2006; Elkins and Schurer, 2020), future work should explore the question of causality and whether early childhood interventions impact altruism and prosocial behavior. Such efforts would complement a growing body of literature showing that personality attributes can be influenced during early childhood (Alan and Ertac, 2018; Alan et al., 2019; Fort et al., 2020) and how social preferences can be shaped by a child's social environment (Houser et al., 2016; Rao, 2019; Cappelen et al., 2020; Kosse et al., 2020).

Finally, we see a couple of fruitful directions for extending our work. The first builds upon increasing interest in inequality and concepts of fairness (Blanchard and Rodrik, 2021) and a growing literature exploring the factors that shape distributional preferences and perceptions of inequality (Kuziemko et al., 2015; Karadja et al., 2017; Alesina et al., 2018). In this spirit, it would be interesting to explore whether and how LOC beliefs influence perceptions of inequality and support for policies targeting poverty or the distribution of income within a society. As such, we see promise in work that integrates research from social psychology on attributions (Weiner, 1985; Weiner et al., 1988; Skitka

and Tetlock, 1992; Higgins and Shaw, 1999; Lundquist et al., 2002) and how they interact with control beliefs to shape our attitudes towards poverty and redistribution.

A related question of interest is whether LOC beliefs impact the types of causes a donor elects to support and how they allocate donations amongst the causes within their portfolio. In a world with multiple public goods (or charities), the welfare effects of giving depend not only on overall contribution levels but also how contributions are allocated amongst causes. As internals are less likely to help those whose need for assistance is viewed to be controllable, causes that provide services to address such needs are thus less likely to appeal to such individuals. Quantifying the extent to which control beliefs impact the allocation of funds across causes and how this impacts social welfare is thus an important next step in this research agenda.

Appendix

A1 Locus of Control modules

Locus of Control in the *forsa* Panel

We elicited the Locus of Control using the original items from the Psychological Coping Resources component of the Mastery Module by Pearlin and Schooler (1978). This module consists of seven statements, which can be evaluated on Likert scales ranging from 1 (strongly disagree) to 7 (strongly agree).

1. I have little control over the things that happen to me.
2. There is really no way I can solve some of the problems I have.
3. There is little I can do to change many of the important things in my life.
4. I often feel helpless in dealing with the problems of life.
5. Sometimes I feel that I'm being pushed around in life.
6. What happens to me in the future mostly depends on me.
7. I can do just about anything I really set my mind to do.

Large valued answers to questions 1 to 5 indicate an “external” Locus of Control, meaning that a person tends to attribute outcomes, e.g. success or failure, to external factors, while high responses to questions 6 and 7 are related to an “internal” Locus of Control, indicating that a person associates outcomes with its own efforts (Gatz and Karel, 1993). Table A1 depicts the observed answers to the LOC-Module. The mean values are very similar to those observed in Cobb-Clark and Schurer (2013), except for the levels of agreement to the questions 6 and 7, which are slightly lower than those in Cobb-Clark and Schurer (2013), indicating a slightly more external Locus of Control in our sample.

Table A1: Answers to the LOC-Module in the *forsa* Panel

Question No.	Strongly Disagree	2	3	4	5	6	Strongly Agree	Mean (S.D.)	Mean (S.D.) in Cobb-Clark and Schurer (2013)
1	18.8	33.7	20.8	13.9	8.2	3.4	1.3	2.7 (1.4)	2.8 (1.6)
2	31.4	30.3	12.7	10.4	7.5	4.5	3.6	2.6 (1.7)	2.6 (1.6)
3	19.3	31.1	20.3	13.3	10.1	4.5	1.5	2.8 (1.5)	2.7 (1.6)
4	31.9	36.0	13.8	9.1	5.6	2.6	1.0	2.3 (1.4)	2.6 (1.6)
5	19.9	28.1	16.5	13.9	12.3	6.4	2.9	3.0 (1.7)	2.7 (1.6)
6	3.5	8.3	12.7	18.8	24.9	21.7	10.0	4.6 (1.6)	5.5 (1.6)
7	4.2	9.7	16.5	19.2	25.2	18.8	6.5	4.3 (1.5)	5.3 (1.5)

Locus of Control in the Arizona Project

In the Arizona Project, Locus of Control was elicited using a subset of the I-E Scale by Rotter (1966). This subset consists of 6 statement-pairs and respondents are asked to decide on one statement out of each pair. In every pair, there is one statement representing an internal LOC and one statement representing an external LOC:

1. a) Many of the unhappy things in people's lives are partly due to bad luck. (external)
b) People's misfortunes result from the mistakes they make. (internal)
2. a) In the long-run people get the respect they deserve. (internal)
b) Unfortunately, an individual's worth often passes unrecognized no matter how hard he tries. (external)
3. a) I have often found that what is going to happen will happen. (external)
b) Trusting to fate has never turned out as well for me as making a decision to take a definitive course of action. (internal)
4. a) Becoming a success is a matter of hard work, luck has little or nothing to do with it. (internal)
b) Getting a good job depends mainly on being in the right place at the right time. (external)

5. a) Most people don't realize the extent to which their lives are controlled by accidental happenings. (external)
- b) There really is no such thing as "luck". (internal)
6. a) What happens to me is my own doing. (internal)
- b) Sometimes I feel that I don't have enough control over the direction my life is taking. (external)

The mean values of the respondents' decisions are depicted in Table A2. The decisions are coded as dummy variables, where 1 indicates the selection of the internal statement of a statement pair.

Table A2: Answers to the LOC-Module in the Arizona Project

Question No.	Internal Answers
1	0.69
2	0.49
3	0.63
4	0.69
5	0.49
6	0.79

Locus of Control in the German Socio-Economic Panel

The LOC scale used in the SOEP was developed by Nolte et al. (1997). The approval of each statement is elicited on Likert scales ranging from 1 (strongly disagree) to 7 (strongly agree):

1. How my life goes depends on me.
2. Compared to other people, I have not achieved what I deserve.

3. What a person achieves in life is above all a question of fate or luck.
4. If you're socially or politically engaged, you can influence social circumstances.
5. I frequently have the experience that other people have a controlling influence over my life.
6. One has to work hard in order to succeed.
7. If I run up against difficulties in life, I often doubt my own abilities.
8. The opportunities that I have in life are determined by the social conditions.
9. Innate abilities are more important than any efforts one can make.
10. I have little control over the things that happen in my life.

In analyzing these answers we combine the approaches by Caliendo et al. (2015) and Preuss and Hennecke (2018): First, we omit item 4 from the analysis because it is found not to load on the internal Locus of Control factor in Caliendo et al. (2015) and Preuss and Hennecke (2018). Additionally, the wording comes close to what we refer to as the *situation specific* LOC, which is not what we intend to measure. Second, we omit item 9 from the analysis because as also stated by Preuss and Hennecke (2018), agreement with this statement is not clearly identifiable as revealing an internal or an external LOC.

Table A3: Answers to the LOC-Module in the German Socio-Economic Panel

Question No.	Strongy Disagree	2	3	4	5	6	Strongly Agree	Mean (S.D.)
1	1.0	1.9	5.3	12.6	26.1	28.7	24.4	5.4 (1.3)
2	20.2	21.2	14.7	15.9	14.8	9.0	4.3	3.3 (1.8)
3	11.5	19.7	18.5	22.4	14.3	8.4	5.3	3.5 (1.7)
4	31.9	36.0	13.8	9.1	5.6	2.6	1.0	2.3 (1.4)
5	20.6	23.9	17.1	15.4	12.5	7.3	3.3	3.1 (1.7)
6	0.5	0.9	2.0	6.6	17.2	33.9	39.0	6.0 (1.1)
7	17.4	24.1	18.2	16.9	13.7	6.8	2.8	3.2 (1.6)
8	3.1	7.1	12.1	26.6	25.3	17.7	8.1	4.5 (1.5)
9	1.2	3.7	10.2	27.0	26.3	20.5	11.2	4.8 (1.3)
10	24.1	30.4	17.7	14.2	7.7	4.1	1.8	2.7 (1.5)

A2 Acceptance of a larger renewable energy levy in the *forsa* Panel: Robustness of the findings

As the results concerning the acceptance of the EEG levy to promote green electricity in the *forsa* Panel are based on stated preferences, we investigate their reliability based on corrections suggested in the contingent valuation literature. Carson and Groves (2007) argue that the incentive compatibility of hypothetical choice experiments hinges on a discrete-choice design of the valuation experiment and the respondents' belief that their answers will have political consequences. Therefore, we re-estimate the model with a sub-sample that is restricted to the respondents who were randomized into (i) facing the actual discrete-choice question instead of the open-ended question and (ii) seeing a consequential script prior to the valuation experiment, as suggested in Bulte et al. (2005). The consequential script was intended to increase the respondents' belief in political consequences of their answers and read: "We would like to point out that this study is part of a research project commissioned by the German Federal Ministry of Education and Research (BMBF). The results of this study will be made available to politicians and serve as a basis for future decisions, in particular with regard to the determination of the levy

for the promotion of renewable energies (EEG levy). In order to arrive at meaningful decisions, it is therefore important that you state exactly the willingness to pay that you are actually prepared to pay.”

Table A4: forsa panel - OLS estimates (standardized outcomes) – robustness check

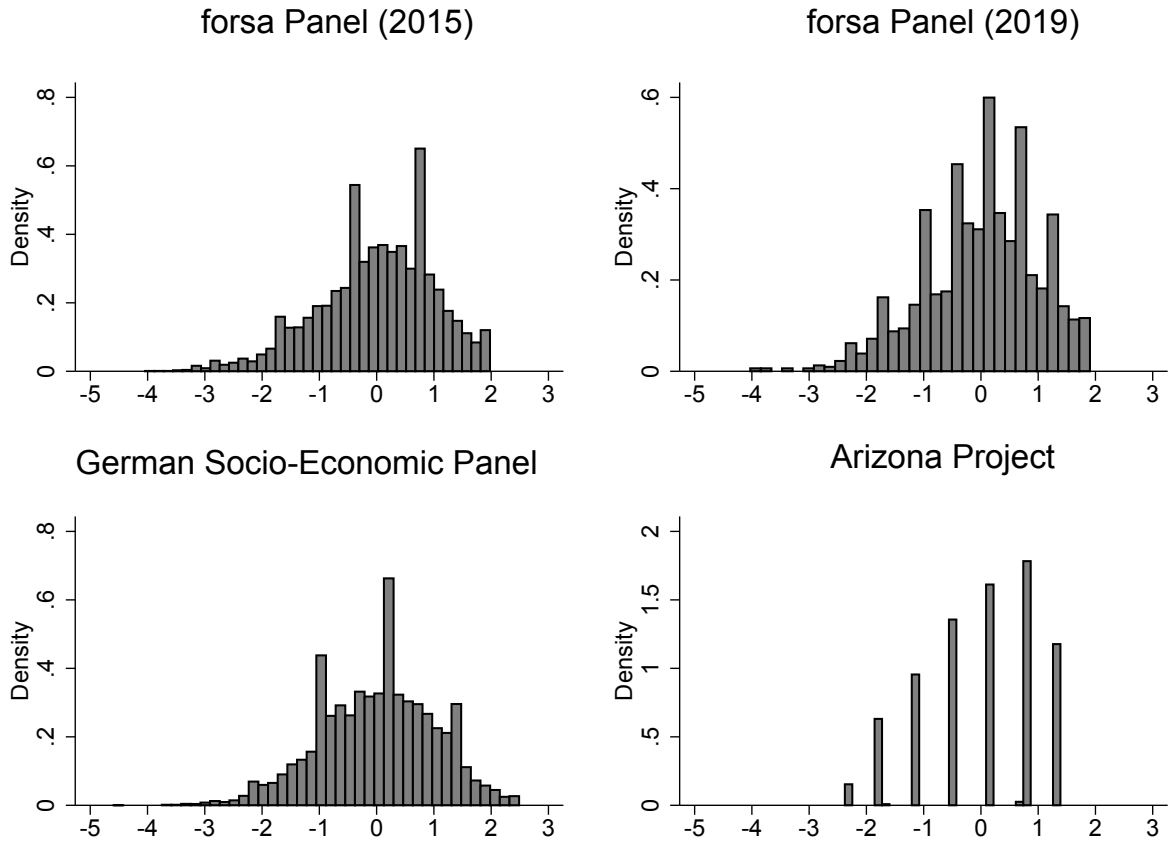
	I	II	III
LOC ^{stand}	0.123** (0.025)	0.141** (0.027)	0.118** (0.027)
Socio-Economic controls			✓
Obs. with missing controls excluded		✓	✓
No. obs.	1,463	1,282	

Note: Robust standard errors are reported in parentheses. ***, ** and * indicate statistical significance at the 1%, 5% and 10% level, respectively.

Compared to the full sample results in Table A6, Table A4 suggests that the association between LOC and the acceptance of an increase in the EEG levy for the sample confronted with the incentive-compatible experimental design is even slightly stronger. This corroborates our conclusions and suggests that our main results in Table A6 are conservative estimates.

A3 Figures

Figure A1: Distribution of the standardized LOC index



A4 Tables

Table A5: *forsa* panel: Summary statistics

Variable	Explanation	Mean	Std. Dev.	N	Mean	Std. Dev.	N
Locus of Control							
LOC	Locus of Control Index (before standardization)	5.0	1.0	6,129	5.1	1.0	1,664
LOC ^{stand}	Locus of Control Index (after standardization)	0	1	6,129	0	1	1,664
Green electricity							
Adopted a green electricity tariff	Dummy: 1 if respondent has a green tariff	0.22	–	6,772			
Environmental policy							
Acceptance a larger renewable energy levy	Dummy: 1 if respondent is willing to pay an EEG levy of 6.24 ct/kWh plus						
	1 Cent	0.61	–	2,027			
	2 Cents	0.53	–	2,082			
	4 Cents	0.33	–	1,983			
	Total	0.49	–	6,092			
Modified dictator game							
Amount invested in carbon offsets	€–Amount invested in carbon offsets				61.4	35.5	1,481
Control Variables							
Age	Age of respondent	55.3	13.3	7,077	54.1	15.9	1,845
Female	Dummy: 1 if respondent is a woman	0.34	–	7,077	0.45	–	1,845
Vocational training	Dummy: 1 if respondent completed vocational training	0.63	–	6,181	0.60	–	1,691
College degree	Dummy: 1 if respondent has a university degree	0.30	–	6,181	0.28	–	1,691
Income	Monthly household net income in €	2,882	1,320	5,607	3,130	1,398	1,570
Year	Survey year		2015			2019	

Table A6: *forsa* panel - OLS estimates (standardized outcomes)

	Green electricity			Environmental policy			Modified dictator game		
	Adopted a green electricity tariff			Accepts a larger renewable energy levy			Amount invested in carbon offsets		
	I	II	III	IV	V	VI	VII	VIII	IX
LOC ^{stand}	0.055*** (0.013)	0.057*** (0.014)	0.047*** (0.014)	0.078*** (0.013)	0.086*** (0.014)	0.076*** (0.014)	0.158*** (0.027)	0.139*** (0.029)	0.131*** (0.028)
ln(Income)	-	-	0.041 (0.031)	-	-	0.006 (0.030)	-	-	0.087 (0.056)
Female	-	-	0.064** (0.031)	-	-	0.182*** (0.031)	-	-	0.163*** (0.056)
Age	-	-	-0.005*** (0.001)	-	-	0.001 (0.001)	-	-	-0.010*** (0.002)
College Degree	-	-	0.095 (0.060)	-	-	0.118** (0.060)	-	-	0.092 (0.096)
Vocational Training	-	-	-0.001 (0.055)	-	-	-0.087 (0.056)	-	-	0.067 (0.088)
Open-Ended	-	-	-	-	-	0.165*** (0.027)	-	-	-
2 Cents	-	-	-	-	-	-0.178*** (0.034)	-	-	-
4 Cents	-	-	-	-	-	-0.576*** (0.033)	-	-	-
Constant	0.000 (0.013)	0.000 (0.014)	-0.125 (0.255)	-0.000 (0.013)	0.000 (0.014)	0.052 (0.248)	0.000 (0.027)	-0.000 (0.028)	-0.304 (0.457)
Obs. with missing controls excluded		✓	✓		✓	✓		✓	✓
Mean of the outcome	0.225	0.230	0.230	0.488	0.488	0.497	61.47	61.77	61.77
S.D. of the outcome	0.418	0.421	0.421	0.500	0.500	0.500	35.42	35.28	35.28
No. obs.	5,899	5,118	5,118	5,548	5,548	4,859	1,383	1,243	1,243

Note: Robust standard errors are reported in parentheses. ***, ** and * indicate statistical significance at the 1%, 5% and 10% level, respectively.

Table A7: *forsa* panel - OLS estimates (outcomes in levels)

	Green electricity			Environmental policy			Modified dictator game		
	Adopted a green electricity tariff			Accepts a larger renewable energy levy			Amount invested in carbon offsets		
	I	II	III	IV	V	VI	VII	VIII	IX
LOC ^{stand}	0.023*** (0.005)	0.024*** (0.006)	0.020*** (0.006)	0.039*** (0.007)	0.043*** (0.007)	0.038*** (0.007)	5.606*** (0.953)	4.906*** (1.006)	4.624*** (1.003)
ln(Income)	-	-	0.017 (0.013)	-	-	0.003 (0.015)	-	-	3.087 (1.987)
Female	-	-	0.027** (0.013)	-	-	0.091*** (0.015)	-	-	5.763*** (1.988)
Age	-	-	-0.002*** (0.000)	-	-	0.000 (0.001)	-	-	-0.357*** (0.060)
College Degree	-	-	0.040 (0.025)	-	-	0.059** (0.030)	-	-	3.250 (3.372)
Vocational Training	-	-	-0.000 (0.023)	-	-	-0.044 (0.028)	-	-	2.364 (3.087)
Open-Ended	-	-	-	-	-	0.083*** (0.014)	-	-	-
2 Cents	-	-	-	-	-	-0.089*** (0.017)	-	-	-
4 Cents	-	-	-	-	-	-0.288*** (0.017)	-	-	-
Constant	0.225*** (0.005)	0.230*** (0.006)	0.177* (0.107)	0.488*** (0.007)	0.497*** (0.007)	0.523*** (0.124)	61.474*** (0.941)	61.767*** (0.991)	51.044*** (16.116)
Obs. with missing controls excluded		✓	✓		✓	✓		✓	✓
No. obs.	5,899		5,118	5,548		4,859	1,383		1,243

Note: Robust standard errors are reported in parentheses. ***, ** and * indicate statistical significance at the 1%, 5% and 10% level, respectively.

Table A8: Arizona Project: Summary statistics

Variable	Explanation	Mean	Std. Dev.	N
Locus of Control				
LOC	Locus of Control Index (before standardization)	0.6	0.3	903
Charitable donations in the past 12 month				
Amount donated	\$-Amount donated to charity in the past year	1,931	5,062	866
Probability to donate	Dummy: 1 if respondent donated a non-zero amount	0.87	-	866
Trimmed at 99th percentile:				
Amount donated	€-Amount donated to charity in the past year	1,493	2,566	852
Probability to donate	Dummy: 1 if respondent donated a non-zero amount	0.87	-	852
Modified dictator game				
Amount given	\$-Amount donated in the experiment	49.5	31.5	904
Probability to give	Dummy: 1 if respondent donated a non-zero amount	0.81	-	904
Control Variables				
Age	Dummy: 1 if respondent's age is between			
	18-24 years	0.03	-	904
	25-34 years	0.16	-	904
	35-44 years	0.18	-	904
	45-54 years	0.20	-	904
	55-64 years	0.20	-	904
	older than 64 years	0.23	-	904
Female	Dummy: 1 if respondent is a woman	0.53	-	904
Income	Dummy: 1 if respondent's annual income is between			
	\$0 and \$10,000	0.03	-	904
	\$10,000 and \$24,999	0.09	-	904
	\$25,000 and \$29,999	0.05	-	904
	\$30,000 and \$39,999	0.09	-	904
	\$40,000 and \$49,999	0.09	-	904
	\$50,000 and \$59,999	0.09	-	904
	\$60,000 and \$69,999	0.07	-	904
	\$70,000 and \$79,999	0.05	-	904
	\$80,000 and \$89,999	0.09	-	904
	\$90,000 and \$99,999	0.07	-	904
	\$100,000 and \$149,999	0.18	-	904
	\$150,000 and \$199,999	0.06	-	904
	larger than \$200,000	0.05	-	904
Education	Dummy: 1 if respondent's education is best described as			
	less than the high school level	0.01	-	904
	on the high school level	0.07	-	904
	attended some college	0.21	-	904
	holds a 2-year college degree	0.11	-	904
	holds a 4-year college degree	0.34	-	904
	holds a professional degree	0.31	-	904
	holds a master's degree	0.18	-	904
	holds a doctoral degree	0.05	-	904

Table A9: Arizona Project - OLS estimates (standardized outcomes)

	Charitable donations in the past 12 month ^a				Modified dictator game			
	Amount donated		Probability to donate		Amount given		Probability to give	
	I	II	III	IV	V	VI	VII	X VIII
LOC ^{norm}	0.156*** (0.032)	0.108*** (0.030)	0.055 (0.034)	0.020 (0.034)	0.022 (0.034)	0.042 (0.034)	0.031 (0.033)	0.060* (0.035)
Annual Income: <10,000	Reference category							
10,000-24,999	-	0.076 (0.081)	-	0.648* (0.353)	-	0.018 (0.208)	-	-0.257 (0.246)
25,000-29,999	-	0.055 (0.084)	-	0.799** (0.371)	-	0.399* (0.231)	-	0.135 (0.252)
30,000-39,999	-	0.075 (0.082)	-	0.775** (0.351)	-	0.124 (0.214)	-	-0.128 (0.250)
40,000-49,999	-	0.163* (0.092)	-	0.767** (0.352)	-	0.254 (0.210)	-	-0.108 (0.246)
50,000-59,999	-	0.239** (0.108)	-	0.790** (0.352)	-	0.313 (0.208)	-	0.012 (0.241)
60,000-69,999	-	0.460*** (0.132)	-	0.896** (0.354)	-	0.535** (0.220)	-	0.132 (0.248)
70,000-79,999	-	0.578*** (0.171)	-	1.044*** (0.354)	-	0.460** (0.234)	-	0.113 (0.265)
80,000-89,999	-	0.524*** (0.150)	-	1.081*** (0.340)	-	0.423** (0.209)	-	0.080 (0.246)
90,000-99,999	-	0.437*** (0.165)	-	0.959*** (0.350)	-	0.433* (0.232)	-	-0.066 (0.263)
100,000-149,999	-	0.537*** (0.118)	-	1.118*** (0.336)	-	0.320 (0.203)	-	-0.085 (0.240)
150,000-199,999	-	0.744*** (0.214)	-	1.079*** (0.341)	-	0.214 (0.233)	-	-0.053 (0.268)
> 200,000	-	0.946*** (0.185)	-	1.186*** (0.345)	-	0.209 (0.241)	-	-0.164 (0.277)
Female	-	-0.006 (0.070)	-	0.070 (0.072)	-	0.228*** (0.069)	-	0.249*** (0.070)
Age: 18-24	Reference category							
25-34	-	-0.048 (0.128)	-	0.314 (0.295)	-	-0.145 (0.210)	-	0.068 (0.215)
35-44	-	-0.082 (0.127)	-	0.176 (0.296)	-	-0.091 (0.210)	-	-0.057 (0.215)
45-54	-	0.061 (0.131)	-	0.360 (0.292)	-	-0.085 (0.208)	-	-0.063 (0.212)
55-64	-	0.172 (0.131)	-	0.539* (0.288)	-	-0.074 (0.208)	-	-0.069 (0.214)
65+	-	0.382*** (0.131)	-	0.591** (0.286)	-	0.046 (0.207)	-	-0.057 (0.212)
Education: Less than	Reference category							

Continued on next page

Table A9 – Continued from previous page

	Charitable donations in the past 12 month ^a				Modified dictator game			
	Amount donated		Probability to donate		Amount given		Probability to give	
	I	II	III	IV	V	VI	VII	X VIII
High School	–	-0.100	–	-0.229	–	0.735**	–	0.709
High School	–	(0.146)	–	(0.524)	–	(0.302)	–	(0.488)
Some College	–	-0.042	–	-0.151	–	0.512*	–	0.402
Some College	–	(0.141)	–	(0.505)	–	(0.293)	–	(0.486)
2-year Degree	–	-0.039	–	-0.144	–	0.478	–	0.465
2-year Degree	–	(0.146)	–	(0.509)	–	(0.299)	–	(0.488)
4-year Degree	–	0.156	–	0.044	–	0.693**	–	0.562
4-year Degree	–	(0.139)	–	(0.499)	–	(0.289)	–	(0.482)
Professional	–	-0.067	–	-0.076	–	0.509	–	0.510
Professional	–	(0.254)	–	(0.530)	–	(0.341)	–	(0.517)
Master’s	–	0.270*	–	0.093	–	0.797***	–	0.639
Master’s	–	(0.157)	–	(0.500)	–	(0.294)	–	(0.485)
Doctorate	–	0.039	–	0.175	–	0.898***	–	0.751
Doctorate	–	(0.184)	–	(0.506)	–	(0.328)	–	(0.503)
Constant	0.000	-0.603***	0.000	-1.246**	0.002	-0.873**	0.002	-0.406
Constant	(0.034)	(0.174)	(0.034)	(0.602)	(0.033)	(0.364)	(0.033)	(0.499)
Mean of the outcome	1493.64		0.866		49.50		0.814	
S.D. of the outcome	2566.50		0.341		31.49		0.389	
No. obs.	852				903			

Note: Robust standard errors are reported in parentheses. ***, ** and * indicate statistical significance at the 1%, 5% and 10% level, respectively. To eliminate the influence of outliers on our estimation results, we trim the estimation sample in Columns I to IV at the 99th percentile of the donation distribution.

Table A10: Arizona Project - OLS estimates (outcomes in levels)

	Charitable donations in the past 12 month ^a				Modified dictator game			
	Amount donated		Probability to donate		Amount given		Probability to give	
	I	II	III	IV	V	VI	VII	X VIII
LOC ^{norm}	400.383*** (82.479)	278.083*** (77.881)	0.019 (0.012)	0.007 (0.012)	0.695 (1.055)	1.313 (1.076)	0.012 (0.013)	0.023* (0.013)
Annual Income: <10,000	Reference category							
10,000-24,999	-	195.746 (207.547)	-	0.221* (0.120)	-	0.557 (6.547)	-	-0.100 (0.096)
25,000-29,999	-	141.993 (215.923)	-	0.272** (0.126)	-	12.552* (7.281)	-	0.053 (0.098)
30,000-39,999	-	192.798 (210.175)	-	0.264** (0.120)	-	3.907 (6.745)	-	-0.050 (0.097)
40,000-49,999	-	419.136* (235.694)	-	0.261** (0.120)	-	8.010 (6.619)	-	-0.042 (0.096)
50,000-59,999	-	612.525** (278.001)	-	0.269** (0.120)	-	9.859 (6.543)	-	0.005 (0.094)
60,000-69,999	-	1180.519*** (340.021)	-	0.305** (0.120)	-	16.829** (6.910)	-	0.052 (0.096)
70,000-79,999	-	1483.273*** (440.096)	-	0.356*** (0.120)	-	14.487** (7.377)	-	0.044 (0.103)
80,000-89,999	-	1344.863*** (384.940)	-	0.368*** (0.116)	-	13.321** (6.593)	-	0.031 (0.096)
90,000-99,999	-	1120.872*** (424.490)	-	0.327*** (0.119)	-	13.643* (7.291)	-	-0.026 (0.102)
100,000-149,999	-	1377.368*** (303.979)	-	0.381*** (0.114)	-	10.074 (6.387)	-	-0.033 (0.094)
150,000-199,999	-	1908.483*** (550.139)	-	0.367*** (0.116)	-	6.729 (7.332)	-	-0.020 (0.104)
> 200,000	-	2427.639*** (475.222)	-	0.404*** (0.118)	-	6.566 (7.592)	-	-0.064 (0.108)
Female	-	-14.610 (178.675)	-	0.024 (0.024)	-	7.192*** (2.179)	-	0.097*** (0.027)
Age: 18-24	Reference category							
25-34	-	-123.370 (328.433)	-	0.107 (0.100)	-	-4.565 (6.618)	-	0.026 (0.084)
35-44	-	-209.832 (325.975)	-	0.060 (0.101)	-	-2.857 (6.613)	-	-0.022 (0.084)
45-54	-	157.083 (336.498)	-	0.123 (0.099)	-	-2.669 (6.535)	-	-0.025 (0.083)
55-64	-	442.275 (335.377)	-	0.184* (0.098)	-	-2.343 (6.537)	-	-0.027 (0.083)
65+	-	980.280*** (335.875)	-	0.201** (0.097)	-	1.461 (6.531)	-	-0.022 (0.083)
Education: Less than	Reference category							

Continued on next page

Table A10 – Continued from previous page

	Charitable donations in the past 12 month ^a				Modified dictator game			
	Amount donated		Probability to donate		Amount given		Probability to give	
	I	II	III	IV	V	VI	VII	X VIII
High School	–	-256.169	–	-0.078	–	23.137**	–	0.276
High School	–	(374.717)	–	(0.179)	–	(9.515)	–	(0.190)
Some College	–	-106.984	–	-0.052	–	16.113*	–	0.157
Some College	–	(362.368)	–	(0.172)	–	(9.237)	–	(0.189)
2-year Degree	–	-99.288	–	-0.049	–	15.043	–	0.181
2-year Degree	–	(375.021)	–	(0.173)	–	(9.423)	–	(0.190)
4-year Degree	–	401.179	–	0.015	–	21.822**	–	0.219
4-year Degree	–	(355.919)	–	(0.170)	–	(9.087)	–	(0.188)
Professional	–	-172.970	–	-0.026	–	16.036	–	0.198
Professional	–	(652.931)	–	(0.180)	–	(10.748)	–	(0.201)
Master’s	–	692.498*	–	0.032	–	25.088***	–	0.249
Master’s	–	(402.644)	–	(0.170)	–	(9.256)	–	(0.189)
Doctorate	–	100.334	–	0.059	–	28.283***	–	0.292
Doctorate	–	(471.431)	–	(0.172)	–	(10.325)	–	(0.196)
Constant	1493.642***	-52.985	0.866***	0.442**	49.550***	22.003*	0.815***	0.656***
Constant	(86.901)	(446.186)	(0.012)	(0.205)	(1.047)	(11.453)	(0.013)	(0.194)
No. obs.		852				903		

Note: Robust standard errors are reported in parentheses. ***, ** and * indicate statistical significance at the 1%, 5% and 10% level, respectively. To eliminate the influence of outliers on our estimation results, we trim the estimation sample in Columns I to IV at the 99th percentile of the donation distribution.

Table A11: SOEP: Summary statistics

Variable	Explanation	Mean	Std. Dev.	N
Locus of Control				
LOC	Locus of Control Index (before standardization)	4.9	0.8	18,405
LOC	Locus of Control Index (after standardization)	0	1	18,405
Charitable donations in 2009				
Amount donated	€-Amount donated to charity in the past year	102.5	458.8	16,716
Probability to donate	Dummy: 1 if respondent donated a non-zero amount	0.43	-	16,847
Trimmed at 99th percentile:				
Amount donated	€-Amount donated to charity in the past year	66.2	161.2	16,501
Probability to donate	Dummy: 1 if respondent donated a non-zero amount	0.41	-	16,501
Blood donation				
At least once since 2000	Dummy: 1 if respondent donated blood in the past 10 years	0.14	-	16,897
At least once in 2009	Dummy: 1 if respondent donated blood in the past year	0.07	-	16,891
Medical reason	Dummy: 1 if there are medical reason that prevent blood donations	0.21	-	16,897
Subset of respondents without medical reasons that prevent blood donations:				
At least once since 2000	Dummy: 1 if respondent donated blood in the past 10 years	0.18	-	13,319
At least once in 2009	Dummy: 1 if respondent donated blood in the past year	0.09	-	13,313
Outcome Variable: In-kind giving				
At least once in 2009	Dummy: 1 if respondent provided in-kind support in the past year	0.15	-	18,751
Hypothetical dictator game				
Amount given	€-Amount given away in the hypothetical dictator game	2132.3	458.8	10,567
Probability to give	Dummy: 1 if respondent gave a non-zero amount	0.70	-	10,567
Voting				
Voted in 2009	Dummy: 1 if respondent voted in the 2009 federal election	0.80	-	23,086
Control Variables				
Age	Age of respondent	46.6	16.8	26,694
Female	Dummy: 1 if respondent is a woman	0.54	-	26,694
Education	Years of education	12.4	2.7	25,520
Income	Monthly household net income in €	2,847	1,861	24,992

Table A12: Part 1: SOEP - OLS estimates (standardized outcomes)

	Charitable donations in 2009 ^a						Blood donation ^b					
	Amount donated			Probability to donate			At least once since 2000			At least once in 2009		
	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII
LOC ^{stand}	0.103*** (0.008)	0.101*** (0.008)	0.041*** (0.008)	0.105*** (0.008)	0.101*** (0.008)	0.056*** (0.008)	0.047*** (0.009)	0.046*** (0.009)	0.032*** (0.009)	0.031*** (0.009)	0.027*** (0.009)	0.018* (0.009)
ln(Income)	-	-	0.316*** (0.015)	-	-	0.242*** (0.015)	-	-	-0.023 (0.017)	-	-	-0.005 (0.017)
Female	-	-	-0.012 (0.016)	-	-	0.118*** (0.016)	-	-	0.016 (0.018)	-	-	-0.002 (0.018)
Age	-	-	0.012*** (0.000)	-	-	0.013*** (0.000)	-	-	-0.011*** (0.001)	-	-	-0.009*** (0.001)
Year of education	-	-	0.075*** (0.003)	-	-	0.068*** (0.003)	-	-	0.024*** (0.004)	-	-	0.010*** (0.004)
Constant	0.000 (0.008)	-0.000 (0.008)	-4.026*** (0.114)	-0.000 (0.008)	-0.000 (0.008)	-3.465*** (0.115)	0.000 (0.009)	0.000 (0.009)	0.403*** (0.133)	-0.000 (0.009)	-0.000 (0.009)	0.339** (0.134)
Obs. with missing controls excluded		✓	✓		✓	✓		✓	✓		✓	✓
Mean of the outcome	66.39	68.26		0.411	0.422		0.176	0.180		0.092	0.923	
S.D. of the outcome	161.53	163.107		0.492	0.494		0.381	0.385		0.289	0.289	
No. obs.	16,113	14,539		16,113	14,539		13,023	11,607		13,017	11,603	

Note: Robust standard errors are reported in parentheses. ***, ** and * indicate statistical significance at the 1%, 5% and 10% level, respectively. ^aTo eliminate the influence of outliers on our estimation results, we trim the estimation sample at the 99th percentile of the donation distribution. ^bRespondents who reported that there are medical reasons for not being able to donate blood are excluded from the estimation sample.

Table A13: Part 2: SOEP - OLS estimates (standardized outcomes)

	In-kind giving At least once in 2009			Hypothetical dictator game						Voting Voted in 2009		
	XIII	XIV	XV	Amount given			Probability to give			XXII	XXIII	XXIV
				XVI	XVII	XVIII	XIX	XX	XXI			
LOC ^{stand}	0.030*** (0.007)	0.023*** (0.008)	-0.004 (0.008)	0.040*** (0.010)	0.042*** (0.010)	0.070*** (0.009)	0.029*** (0.010)	0.032*** (0.010)	0.041*** (0.010)	0.101*** (0.008)	0.099*** (0.009)	0.049*** (0.009)
ln(Income)	-	-	0.117*** (0.015)	-	-	-0.039** (0.017)	-	-	-0.055*** (0.019)	-	-	0.243*** (0.015)
Female	-	-	0.134*** (0.016)	-	-	0.222*** (0.018)	-	-	0.284*** (0.020)	-	-	0.011 (0.016)
Age	-	-	0.002*** (0.000)	-	-	0.027*** (0.001)	-	-	0.013*** (0.001)	-	-	0.009*** (0.001)
Year of education	-	-	0.041*** (0.003)	-	-	-0.009** (0.004)	-	-	0.023*** (0.004)	-	-	0.064*** (0.003)
Constant	-0.000 (0.007)	0.000 (0.008)	-1.610*** (0.113)	-0.000 (0.010)	-0.000 (0.010)	-1.109*** (0.132)	0.000 (0.010)	0.000 (0.010)	-0.707*** (0.146)	-0.000 (0.008)	0.000 (0.008)	-3.185*** (0.123)
Obs. with missing controls excluded		✓	✓		✓	✓		✓	✓		✓	✓
Mean of the outcome	0.150	0.150		2117.34	2163.22		0.700	0.702		0.834	0.838	
S.D. of the outcome	0.357	0.357		2454.03	2480.70		0.458	0.458		0.372	0.368	
No. obs.	18,284	16,367		10,324	9,327		10,234	9,327		15,576	14,145	

Note: Robust standard errors are reported in parentheses. ***, ** and * indicate statistical significance at the 1%, 5% and 10% level, respectively. ^aTo eliminate the influence of outliers on our estimation results, we trim the estimation sample at the 99th percentile of the donation distribution. ^bRespondents who reported that there are medical reasons for not being able to donate blood are excluded from the estimation sample.

Table A14: Part 1: SOEP - OLS estimates (outcomes in levels)

	Charitable donations in 2009 ^a						Blood donation ^b					
	Amount donated			Probability to donate			At least once since 2000			At least once in 2009		
	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII
LOC ^{stand}	16.717*** (1.266)	16.462*** (1.346)	6.721*** (1.293)	0.051*** (0.004)	0.050*** (0.004)	0.028*** (0.004)	0.018*** (0.003)	0.018*** (0.004)	0.012*** (0.004)	0.009*** (0.003)	0.008*** (0.003)	0.005* (0.003)
ln(Income)	-	-	51.596*** (2.383)	-	-	0.119*** (0.007)	-	-	-0.009 (0.007)	-	-	-0.001 (0.005)
Female	-	-	-1.964 (2.533)	-	-	0.058*** (0.008)	-	-	0.006 (0.007)	-	-	-0.000 (0.005)
Age	-	-	2.013*** (0.076)	-	-	0.006*** (0.000)	-	-	-0.004*** (0.000)	-	-	-0.002*** (0.000)
Year of education	-	-	12.222*** (0.513)	-	-	0.034*** (0.002)	-	-	0.009*** (0.001)	-	-	0.003*** (0.001)
Constant	66.393*** (1.266)	68.257*** (1.346)	-588.476*** (18.602)	0.411*** (0.004)	0.422*** (0.004)	-1.289*** (0.057)	0.176*** (0.003)	0.180*** (0.004)	0.335*** (0.051)	0.092*** (0.003)	0.092*** (0.003)	0.190*** (0.039)
Obs. with missing controls excluded		✓	✓		✓	✓		✓	✓		✓	✓
No. obs.	16,113	14,539		16,113	14,539		13,023	11,607		13,017	11,603	

Note: Robust standard errors are reported in parentheses. ***, ** and * indicate statistical significance at the 1%, 5% and 10% level, respectively. ^aTo eliminate the influence of outliers on our estimation results, we trim the estimation sample at the 99th percentile of the donation distribution. ^bRespondents who reported that there are medical reasons for not being able to donate blood are excluded from the estimation sample.

Table A15: Part 2: SOEP - OLS estimates (outcomes in levels)

	In-kind giving At least once in 2009			Hypothetical dictator game						Voting Voted in 2009		
				Amount given			Probability to give					
	XIII	XIV	XV	XVI	XVII	XVIII	XIX	XX	XXI	XXII	XXIII	XXIV
LOC ^{stand}	0.011*** (0.003)	0.008*** (0.003)	-0.002 (0.003)	99.231*** (24.135)	103.060*** (25.667)	174.467*** (23.001)	0.013*** (0.005)	0.015*** (0.005)	0.019*** (0.005)	0.037*** (0.003)	0.037*** (0.003)	0.018*** (0.003)
ln(Income)	-	-	0.042*** (0.005)	-	-	-96.647** (42.173)	-	-	-0.025*** (0.009)	-	-	0.089*** (0.006)
Female	-	-	0.048*** (0.006)	-	-	551.261*** (45.283)	-	-	0.130*** (0.009)	-	-	0.004 (0.006)
Age	-	-	0.001*** (0.000)	-	-	65.914*** (1.292)	-	-	0.006*** (0.000)	-	-	0.003*** (0.000)
Year of education	-	-	0.014*** (0.001)	-	-	-22.702** (8.877)	-	-	0.011*** (0.002)	-	-	0.024*** (0.001)
Constant	0.150*** (0.003)	0.150*** (0.003)	-0.425*** (0.040)	2117.389*** (24.134)	2163.221*** (25.666)	-587.001* (328.090)	0.700*** (0.005)	0.702*** (0.005)	0.378*** (0.067)	0.834*** (0.003)	0.838*** (0.003)	-0.335*** (0.045)
Obs. with missing controls excluded		✓	✓		✓	✓		✓	✓		✓	✓
No. obs.	18,284	16,367		10,324		9,327	10,324	9,327		15,576		14,145

Note: Robust standard errors are reported in parentheses. ***, ** and * indicate statistical significance at the 1%, 5% and 10% level, respectively. ^aTo eliminate the influence of outliers on our estimation results, we trim the estimation sample at the 99th percentile of the donation distribution. ^bRespondents who reported that there are medical reasons for not being able to donate blood are excluded from the estimation sample.

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