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World Values Survey Response and Behavior: Emancipative and Secular Values Predict Cooperation, Protection of Property and Pro-Social Behavior

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ABSTRACT

Measures from standardized surveys are the main data source for cross-cultural research. Yet, a direct link between survey responses and individual behavior is rarely observed. We study the link between values and various forms of pro-social behavior. We invite the respondents of the sixth wave of the World Values Survey in Germany to participate in an online experiment. The experiment consists of a series of incentivized games and allows us to study the link between survey measured moral values and behavior. The evidence boils down to three findings. While emancipative values motivate higher common pool contributions (1) and higher donations to charitable organizations (2), secular values inspire more productive and less protective investments (3). We argue that incentivized behavioral experiments offer a promising complementary tool to measure cross-societal differences, with the distinct advantage that the underlying decision situation is defined by formal rules and payoff functions, which are independent of language and cultural context.

Key words: values; behavior; experiment; survey; equivalence, cooperation, pro-social behavior; property

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INTRODUCTION

It is widely understood that cooperative behavior among strangers is the key ingredient of thriving societies in which institutions function impartially (Axelrod, 1986; Ostrom, 1990; Coleman, 1990; North, Wallis, & Weingast, 2009; Bowles & Gintis, 2011). At the same time, countless writings suggest that moral values provide a major source of cooperative behavior (Kluckhohn, 1951; Eckstein, 1966, 1998; Inkeles, 1969, 1983; Rokeach, 1968, 1973; Axelrod, 1986; Putnam, 1993, 2000; Welzel, 2010). But the claim that moral values indeed guide cooperative behavior has more often been assumed than evidenced. One reason for this missing value-behavior link is the separation of the social sciences into two different methodological traditions—a separation that is rarely bridged.

For one, incentivized behavioral experiments are a growing industry in the observational social sciences. This is especially true for those fields of research interested in the origins of human cooperation. The main advantage of behavioral game theory (Camerer, 2003; Fehr & Camerer, 2004) as a method is that it allows for experimental control of treatments, which facilitates causal inferences. Moreover, the fact that the triggering of behavior is based on a formal game facilitates the comparison of outcomes across various cultures, because the underlying decision situation is kept constant (Herrmann, Thöni, & Gächter, 2008; Gächter, Herrmann, & Thöni, 2010). By far most of these games are still conducted with convenient samples from student populations and it is an ongoing debate to what extent the results of such games can be generalized to entire national populations (Henrich, Heine, & Norenzayan, 2010).

A different approach to study the sources of people's social behavior is research in moral values. Apart from economic interests and social norms, moral values supposedly guide action towards preferred outcomes (Inglehart, 1977, 1990, 1997; Hofstede, 2001[1980], 1997; Schwartz, 2004, 2006, 2007). Usually, data on people's moral values are gathered through public opinion surveys. The largest cross-national project in this context is the World Values Survey (WVS). Besides their wide global coverage, the advantage of these data is their generalizability to entire national populations. Yet, opinion surveys lack experimental control and when it comes to study behavior, they only cover reported behavior, as opposed to observed behavior.

It is clear then that the advantages of behavioral experiments and opinion surveys are complementary. Thus, to study the link between moral values and cooperative behavior one must combine opinion surveys with behavioral experiments. This is what our project did: we used the sixth round of the WVS in Germany to invite the roughly 2,000 representatively surveyed respondents to participate in an online behavioral ex-

¹ We thank Lorenz Goette as well as the conference participants of the IMEBESS 2015 in Toulouse for helpful comments and suggestions. We gratefully acknowledge financial support from the Deutsche Forschungsgemeinschaft and the Swiss National Science Foundation.

periment after they had finished the interview. This allows us for the first time to study directly the link between moral values and pro-social behavior.

Our study focuses on two dimensions of moral values that have shown the greatest impact on social outcomes: (1) secular values and (2) emancipative values. We look at the link of these values to three types of pro-social behavior: (1) common pool contributions, (2) productive versus protective investments and (3) voluntary donations. For the first time, we study the link of these values and behaviors directly at the individual level and within a nationally representative sample.

We show that survey measures and behavior are linked: (a) emancipative values motivate higher common pool contributions, (b) stronger secular values inspire more productive and less protective investments, and (c) emancipative values lead to higher donations. Even though participants of the online survey display slightly stronger emancipative values compared to the surveyed population, our results are robust when we control for selection bias.

Our methodological contribution is that we develop a novel, internet based behavioral experiment. This tool can easily be adapted to other languages and used for cross-cultural research. In addition, it is relatively easy to run with large populations because it does not require a laboratory and subjects can participate from any internet connected device. Brislin (1970) pointed out that one of the major challenges of cross-cultural research is to ensure equivalence when running an empirical study in different languages. Differences in measurement cannot unanimously be attributed to differences in the variable of interest, because the wording of the instructions and questions might give rise to different associations in the various languages. Besides language, context can differ considerably between cultures, which might also undermine equivalence (see also Hui and Triandis, 1985). While the description of the task in our online study still relies to some degree on natural language, we argue that using behavioral experiments mitigates the equivalence problem substantially. The reason is that the underlying strategic situation is a well-defined game, i.e., it consists of a set of formal rules and mathematical functions.² These rules and functions are independent of the cultural context and the language of exposition. Furthermore, while the instructions in studies using behavioral experiments are typically text based, we make extensive use of graphical elements when explaining the game to the subjects and minimize the use of text. This further reduces the influence of natural language when eliciting data in various cultures.

On the other hand, conducting behavioral experiments is often more demanding in terms of researcher's as well as responder's resources. This means that the number of concepts that can be measured is typically lower than in surveys of comparable length. In the spirit of Hui and Triandis (1985), we see behavioral experiments as a complementary tool for cross-cultural research, which should be used in combination with other methods. Our research presents a cross-validation of a series of behavioral experiments with a number of constructs measured by the WVS.

² A strategic game is defined by (i) a set of players, (ii) a set of strategies for each player, and (iii) the players' preferences (see e.g. Osborne & Rubinstein, 1994). While (i) and (ii) are under full control of the experimenter, the participants preferences are not directly observable. The pioneering work by Smith (1976) highlighted the importance of inducing preferences with financial incentives. Smith argues that this can be achieved „[...] by using a reward structure to induce prescribed monetary value on actions“ (p.275).

The paper proceeds as follows. In section 2 we introduce the design and procedures in more detail. Section 3 presents the results of the behavioral experiments and relate them to measures from the WVS. Section 4 concludes.

DESIGN AND PROCEDURES

Since 1981, the European Values Study (EVS) and WVS conduct representative public opinion surveys in scores of countries around the world. The basis is an English-language, fully standardized master questionnaire. The questionnaire covers a host of topics, from social capital to tolerance to trust to happiness to civic engagement. The master questionnaire is translated into national languages with semantic checks through back-translation. Questionnaires are administered among randomly selected residents of an average sample size of 1,000 people per country. The sampling population consists of a given society's adult residents (not citizens). Fieldwork is usually conducted through face-to-face interviews. Average interview length is about fifty minutes. Thus far, the EVS/WVS has conducted some 300 national surveys in by now 106 societies that represent more than 90 percent of the world population. Further details on fieldwork, sampling, questionnaires as well as downloadable datasets can be found at www.worldvaluessurvey.org. All data are public domain.

Between 2010 and 2014, the WVS finalized its most recent and sixth round of surveys in a total of sixty societies. As part of this project, the sixth German WVS was fielded in fall 2013. Roughly 2,000 interviews have been realized. A methods report is available at the above cited website of the WVS. To link observed behavior in the online study to the values measured by the WVS we focus on two sets of explanatory variables. The first set includes the simple measures for trust and civic norms widely used in the literature on social capital. The second set is construct from a large number of survey items to measure values on two well-known dimensions: secular values and emancipative values. These play a particularly prominent role in theories of cultural and behavioral change and have been shown to be indicative of a host of life quality indicators, from subjective wellbeing to life expectancy to education, information access, income equality, physical security, rule of law, democracy, social capital and ecological sustainability (Welzel, Inglehart, & Klingemann, 2003; Inglehart & Welzel, 2005, 2010; Welzel, 2013). How exactly the two sets of values are measured and is explained below.

The second part of our study consists of an online experiment in which the respondents were invited to participate. The interviewers informed all participants of the WVS about our online study at the end of the interview. Each participant received a flyer with information about the content of the online study, the possibility of earning money, and the login information. Each participant received a unique and randomly generated six digit login code. We used this code to match the answers in the questionnaire to the behavior in the online games. Moreover, all participants were asked by the interviewer to indicate their email address. Participants willing to provide us their address received an email with a personalized link to our online study.

The study consisted of several decision situations: a public goods game, a property rights game, and a donation decision.³ Furthermore, all parts of the online experi-

³ Participants also played a public goods game with punishment, a risk elicitation task, and a task measuring honesty. To keep the paper concise we restrict our attention to the public goods game, the property rights game and the donation decision. In short, the analysis of the remaining games supports the results reported in this paper. The link between the moral

ment are designed such that no real-time interaction among the participants was necessary. For all decisions involving more than one participant, we collected the answers over the entire data collection period and matched subjects into groups at the very end of the study. Participants could answer the questions at their convenience and it was possible to quit the study and continue at a later point in time.

Following the methodological standards for behavioral games we incentivized the decisions of participants. In all decision situations subjects could earn Talers. The amount of Talers depended on their decision, luck, and – in case of group decisions – on the decision of another randomly selected participant. For each decision situation we randomly drew a group or a person, who received the amount they earned in the given situation. The Talers were paid out to the winners with an exchange rate of 1 Taler to 4 Euros. The fact that they could earn money and the exchange rate was communicated to all participants at the beginning of the experiment. At the very end of the online experiment participants were asked to indicate (on a voluntary basis) an email address such that we could contact them in case they were drawn for receiving their profits in money. Among all participants who completed the online experiment and provided us with their email address we drew 13 for payment. These participants earned on average €305 (min: €0, max: €700). Payments were made via bank transfers.

Trust and Civic Norms

The literature defines social capital as encompassing trust, adherence to cooperative norms and membership in voluntary associations (Coleman, 1990; Putnam, 1993). Knack and Keefer (1997) were among the first to include measures for social capital in a cross-country analysis. They found that higher levels of trust and civic cooperation correlate positively with economic growth and investment rates across countries. To measure a country's average trust level, the authors calculated the percentage of respondents answering "most people can be trusted" to the WVS question: "Generally speaking, would you say that most people can be trusted or that you need to be very careful in dealing with people?" The average strength of civic norms in a country is measured by a given population's overall rejection of three anti-social behaviors addressed in the WVS, namely "claiming government benefits to which you are not entitled", "accepting a bribe while performing one's duties" and "cheating on taxes if you have a chance". Using the same measures, other researchers continued to evaluate the link between social capital and economic outcomes. For example, Guiso, Sapienza, and Zingales (2004) show that social capital is positively related to the degree of financial development. Similarly, Aghion, Algan, Cahuc, and Shleifer (2010) find that low levels of social capital are linked to more government regulations.

The frequent use of these measures of trust gave rise to a literature investigating the explanatory power of trust in controlled experiments. Glaeser, Laibson, Scheinkman, and Soutter (2000) investigate the relation between the trust question and behavior in a trust game and do not find a strong relation. Gächter, Hermann, and Thöni (2004) find

values and the public goods game with punishment is essentially the same as in public goods game (see section "Contributions to the public good"). Honesty seems to be weakly positively correlated with emancipative values. We do not find evidence that moral values have predictive power for the risk preferences.

only weak evidence for the relation between trust questions and cooperation, while, Thöni, Tyran, and Wegström (2012) find a positive link between trust and cooperative behavior in a large and representative sample of the Danish population. We extend this literature by focusing on a broader array of experimental games and by including civic norms and moral values as additional explanatory variables.

Moral Values

Moral values are considered as internalized preferences about desirable social outcomes and they are supposed to direct people's actions towards these outcomes (Kluckhohn, 1951). Thus, moral values are assumed to be behaviorally consequential. In a dozen or so publications, Inglehart, Norris and Welzel have identified two sets of values as particularly relevant: secular values and emancipative values (Inglehart & Norris, 2003; Norris & Inglehart, 2004; Inglehart & Welzel, 2005). The emergence of these two sets of values is described as a psychological reaction to the societal transformations that modernization brings about. Welzel (2013: 37-56) describes modernization as an empowering process through which the lives of ordinary people improve. Indeed, where and when it happens, modernization makes people's lives safer, longer and enriches them with more options to pursue a purpose of their choice. Modernization, thus, transforms the nature of life, turning it from a source of threats to suffer into a source of opportunities to thrive. As this happens, societies climb the "utility ladder of freedoms": tolerating and practicing freedoms becomes increasingly vital to take advantage of the options that a more promising life offers. In recognition of this utility shift, people change their moral values: they begin to see less value in sacred authority and more value in equal freedoms. The first process—depreciation of sacred authority – is reflected in rising secular values and is linked to a growing sense of existential security. The second process—appreciation of equal freedoms – is reflected in rising emancipative values and linked to a growing sense of individual autonomy.

Emancipative values, for their part, combine an emphasis on freedom of choice with an emphasis on equality of opportunities. The egalitarian component of these values has a strongly anti-discriminatory impetus that favors a deeper internalization of impartiality norms. Welzel (2013: 191-214) hypothesizes that this equity-tendency of emancipative values predisposes their carriers to pro-social, cooperative behavior vis-à-vis strangers. As we will demonstrate, this hypothesis—which has never been tested before—is accurate: people with stronger emancipative values indeed contribute more to common pools and donate more for charity purposes. The latter tendency is particularly pronounced, which brings the altruistic tendency of emancipative more clearly to the surface: donating is freely giving away gains without any return, whereas there still is a return to common pool contributions.

Secular values, on the other hand, grow on rising feelings of existential security. This suggests that supporters of these values are averse to protectionist behavior. Confirming this expectation, our data demonstrate that players with stronger secular values invest their endowed resources in more productive and less so in protective purposes.

Emancipative values and secular values are each measured on the basis of twelve items from the WVS. The twelve items of secular values measure distance from sacred authority in the domains of religion, the nation, the state and group pressures. The twelve items of emancipative values measure an emphasis on equal freedoms in the

domains of personal autonomy, gender equality, the voice of the people and lifestyle choice. These items are combined in a “formative index” procedure, as documented in meticulous detail by Welzel (2013: 57-73). These pages also document the cross-cultural validity and dimensional reliability of these measures as well as their approximately normal distribution. Index scores vary from minimum 0 to maximum 1 on both value indices.

Public Goods Games

The public goods game is one of the standard tools in experimental economics to elicit cooperative behavior (Ledyard, 1995). In our case, we group players in pairs of two on a random basis. Each participant is endowed with 100 Talers and has to decide how many Talers to contribute to a common pool, called the *group account*. All Talers in the group account are multiplied by 1.5 and the resulting sum returned to the two participants in equal shares. Thus, independent of a participant’s contribution to the group account he/she is entitled to half of the amount in the group account. Hence, the payoff function of a participant i in a group with participant j is:

$$\pi_i = 100 - c_i + 0.75(c_i + c_j)$$

Under standard game-theoretic assumptions (selfish preferences and rationality) this game has a unique Nash equilibrium in which both players contribute zero to the public good. From the perspective of the individual, contributing yields a negative payoff because for each Taler she contributes to the group account she only receives 0.75 Talers in return; the fact that she also receives 0.75 Talers for every Taler contributed by the other player does not change the incentive because she receives that return no matter what. In contrast, the added return that both players together receive – the group return – is 1.5 of both contributions. Hence, the social optimum results when both players contribute their full endowment. This game models the conflict between individual and collective rationality and is a model for social dilemmas, ranging from working in a team to produce a joint output up to reducing carbon dioxide emissions.

In the design of the online study we paid much attention to guide participants carefully through the experiment and to give instructions that are intuitive and easy to understand. All instructions are supported by interactive graphs. Participants go through four stages before taking their decision. First, they read the instructions of the public goods game, explained by six bullet points. The bullet points appear consecutively on the screen, and each step is accompanied by a new element in the graphical representation of the game. Participants can go back and forth between the bullet points. Second, participants are shown the payoff consequences of three possible outcomes of the game (zero and full contribution by both participants, and contributions of 60 resp. 100 Talers). Third, participants enter an exploration stage, where they can enter any combination of the two contributions and calculate their own and the other group members’ hypothetical payoff. Figure 1 shows the screen of this exploration stage. Fourth, participants have to answer control questions. In the control questions they are presented with a randomly selected combination of contributions and have to calculate the resulting payoff. Par-

ticipants who provide an incorrect answer are asked to try again for two times.⁴ Finally, participants take their decision and continue with the other parts of the experiment.

Figure 1. Screen Shot of the Public Goods Game.

Player A (left) contributed 60 Talers to the common project and player B contributed his full endowment of 100 Talers to the group project. Hence, both players get 120 out of the group project. At the end, player A earns 160 Talers and player B 120 Talers.



Property Rights Game

The property rights game aims to capture the strategic situation in an environment with weak external enforcement of property rights. The design is similar to Campos-Ortiz et al. (2012). Our game has an agricultural framing in which participants act as “farmers” who can allocate resources (“working hours”) to (i) grow food (produce carrots), (ii) protect their fields, and (iii) take (steal) from the fields of the other farmer. Depending on their own decisions and those of their paired counterpart, players end up with more or less carrots. The final number of carrots is transferred into Talers such that each carrot is equivalent to one Taler. Growing food is the only productive activity, the other two activities affect only the distribution of wealth. In our setting, participants receive an initial monetary endowment⁵, seven fields to grow carrots, and seven units of resources, framed as working hours. They are paired into groups of two. Subjects sim-

⁴ Answering correctly is not a requirement to play the game, as we did not want to lose respondents not willing or unable to answer the control question.

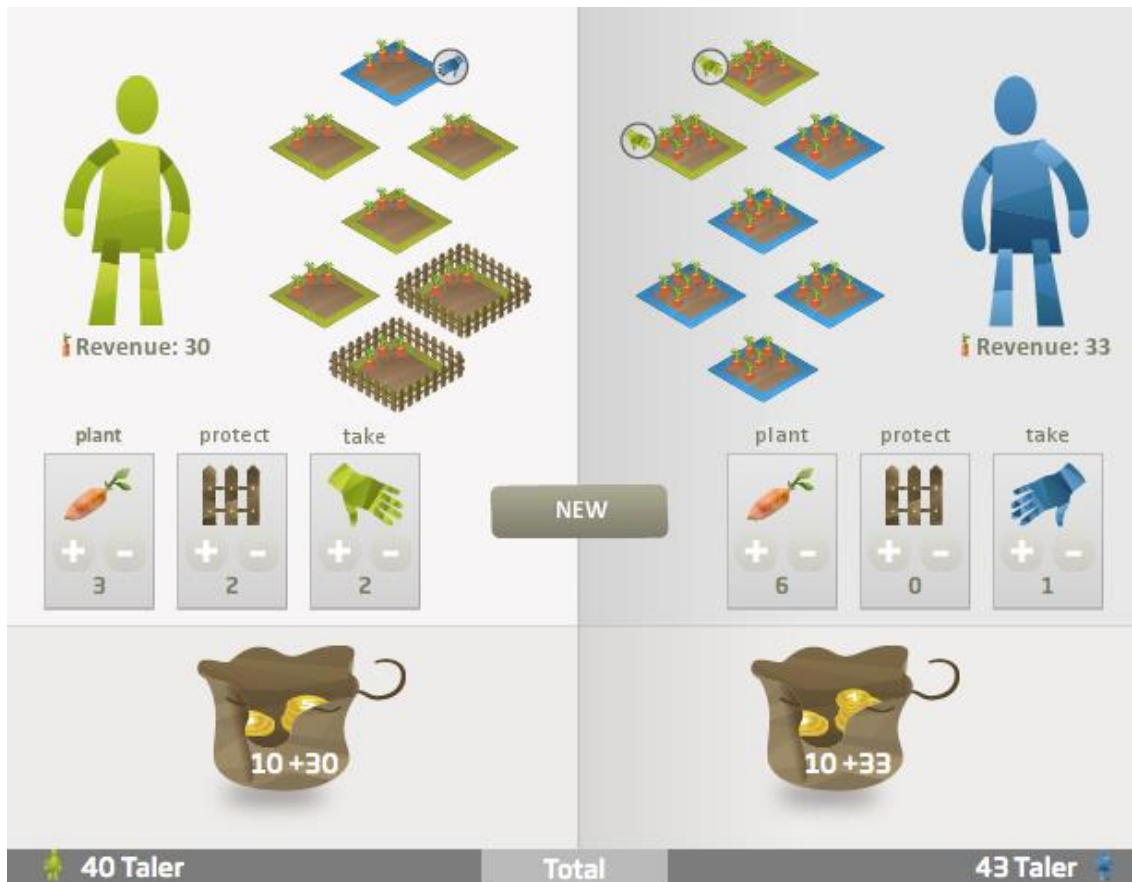
⁵ We implemented three endowment treatments, where the initial endowment in the group was not the same. In one treatment, the player was rich compared to the other person in the group. In the other treatment the player was poor, and in the baseline treatment both players had the same endowment. Allocation to those treatments has been done randomly. Thus, the effect of the treatment should not influence the analysis, with regards to emancipative and secular values. Hence, we will not discuss these treatments in this paper.

ultaneously allocate their resources to production, protection, and steal. Similar to the public goods game participants go through four stages of learning end exploring the game and all parts are accompanied by interactive graphics.

The three activities – production, protect, and steal – have the following payoff implications: each resource for production yields a carrot on each of the seven fields. The marginal return is thus seven Talers if the other participant does not steal some of the participant's fields. Each resource unit allocated to protect builds a fence around one field, i.e. protects this specific field against theft. Each unit allocated to stealing results in the annexation of the crop of one field of the other participant (the hands in Figure 2), up to the number of unprotected fields. Stealing starts from above, protecting starts from below. The marginal return of stealing depends on the allocation of resources of the other participant. If the other participant allocates all her resources to production then stealing a field yields seven Talers. In case the other participant does not plant at all, his fields are empty and stealing provides no benefit.

Figure 2. Screen Shot of the Property Rights Game.

The figure depicts a situation where player A (left) allocates three units to plant, two to protect, and two to take (steal). Player B allocates six units to protect and one to steal. This leads to payoffs of 40 Talers for player A and 43 Talers for player B.



In this game a player's best response under standard assumptions is to allocate all her resources to plant and steal if the other player does not protect and allocates less than six units to steal. If the other player allocates six or more units to steal then the

best response is to protect three or four fields and use the remaining resources to plant. In case the other player protects (and allocates less than six units to steal) there is a unique best-response to allocate all the resources to plant. In brief, a player protects if she expects excessive stealing. She allocates all resources to plant if she expects some (minimal) degree of protection, and she is indifferent between stealing and planting if the other player does not protect at all. Nash equilibria in this game are all situations in which both players allocate all their resources to plant and steal and do not steal more than five units. Payoffs in the Nash equilibria range from 14 in the situation where both players steal five units to 49 with no stealing. The Nash equilibrium without stealing maximizes total surplus and thus is the social optimum. Protection cannot be part of an equilibrium, because the best reply to protect is not to steal, which in turn makes protecting not a best response.

Donation Decision

The third task provides us with a measure for altruism. At the end of the survey participants are asked to indicate how much of their potential earnings they would be willing to donate to a charity of their choice. Participants' earnings depend on random events, therefore they do not yet know their earnings when making this decision. We ask them to indicate the percentage of their potential earnings they are willing to donate. In addition, participants choose a charity from a set of four charities (WWF, Amnesty International, Red Cross, Doctors Without Borders) or indicate any other charitable organization to donate the money. In case a participant is chosen for final payment we allocated the resulting income according to the chosen percentage to the participant and the respective charity.

RESULTS

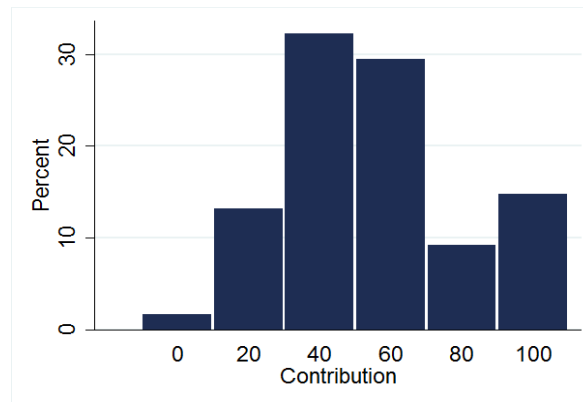
In total 252 respondents of the WVS participated in at least one of the games in the online experiment, of whom 55.6% are women. This compares to 50.4% women in the remainder of the WVS sample, indicating a slight over-representation of female respondents. Participants tend to be younger than the population: the mean age in the online sample is 42.5 (SD = 15.2), compared to 49.5 (SD = 17.7) in the rest of the WVS sample. We will address the potential sampling bias in more detail in section "Controlling for Sample Selection Bias". Over the course of the online experiment we observe some dropout, such that the number of observations varies from one task to the other, leaving us with 179 participants who completed the entire online experiment. Women finish the survey more often than men ($p = .056$, χ^2 -test). Apart from that we find no systematic differences between dropouts and finishers. We start the presentation of our results with an analysis of the public goods game. Then we discuss the property rights game, and finally we address the donation decision.

Contributions to the Public Good

We observe the contributions of 252 participants in the public goods game. The mean contribution is 55.1 out of 100 Talers, with a standard deviation of 25.4. Figure 3 shows the histogram of the contributions. Only four participants contributed zero Talers (1.6%).

Compared to other public goods games, the proportion of free-riders in our experiment is very low. In an online experiment in Denmark, with a randomly selected sample from the population, Thöni et al. (2012) observe that 15 percent of the subjects contribute zero. On the other hand, the average contribution is lower than in the Danish sample, where participants on average contribute 70 percent of their endowment.

Figure 3. Histogram of Contributions to the Public Good



To examine the link between cooperation, social capital and moral values, we conduct multiple regression analyses. We use OLS estimates with robust standard errors to regress the contribution decision in the online experiment on individual survey measures from the WVS interview. We start with the evaluation between trust, civic norms and the contribution in the public goods game. Model (1) in Table 1 depicts the relation between these variables. In line with the results by Thöni et al. (2012) we find that trust predicts contributions in the public goods game. Participants, who think that one can in general trust others, contribute significantly more. The estimated effect suggests that people who trust contribute roughly seven Talers more. On the other hand, people indicating stronger civic norms do not seem to contribute more or less than people indicating weak civic norms. This finding coincides with Welzel's (2007: 405-406) criticism of this measurement as an indicator of civic norms.

Model (2) shows the link between emancipative and secular values and the contribution to the public goods game. The results confirm the predictions by Welzel (2013): people with stronger emancipative values contribute significantly more to the public good. To interpret the observed effect, we standardized the independent variables. Increasing emancipative values by one standard deviation increases the contribution to the public good by 3.5 Talers. The secular values do not seem to account for any variance in the contribution decision. In model (3) and (4) we add control variables to test the robustness of the results observed in model (1) and (2), respectively. Aside from the obvious controls for gender and age we added two control variables capturing general political interest and the political orientation. We will use the same set of control variables in all regressions that follow below.⁶

⁶ Due to the significant correlations between the variables for social capital and moral values, we do not estimate a model which contains all four independent variables at once. The correlation between the emancipative values and trust is 0.077 ($p < 0.001$). On the other hand,

The coefficients of trust and emancipative values stay roughly the same. The control measures we incorporated for general political interest and left-right orientation do not reveal further information in neither of the two models.⁷

Table 1. OLS Estimations for the Contribution to the Public Good

	(1)	(2)	(3)	(4)
	Contribution	Contribution	Contribution	Contribution
Trust	7.039** (3.205)		6.764** (3.416)	
Civic norms	-0.525 (1.855)		-1.526 (1.948)	
Emancipative values		3.498* (1.896)		3.556* (2.080)
Secular values		2.701 (1.864)		2.428 (1.946)
Political interest			-0.394 (1.911)	0.187 (1.957)
Left-right			-1.372 (2.702)	-0.112 (2.811)
Female			-2.183 (3.544)	-3.048 (3.608)
Age			0,075 (0.111)	0.088 (0.108)
Constant	51.274*** (2.138)	52.061*** (1.736)	49.276*** (6.144)	49.602*** (5.899)
F-test	2.4	3.7	1.3	1.4
Prob > F	0.092	0.025	0.262	0.226
R ²	0.012	0.021	0.003	0.010
N	245	246	233	234

Notes: OLS estimates. Dependent variable is contribution [0,100]. Independent variables are standardized except for age, female and trust. Female and trust are dummy variables. Political interest measures how interested a person is in politics. Left-right indicates where a person positions herself with regards to left and right on a scale from 0 to 10, lower numbers indicating left, higher numbers right. Robust standard errors in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

secular values are strongly negatively correlated to the measure for civic norms ($r = -0.527$, $p < 0.001$).

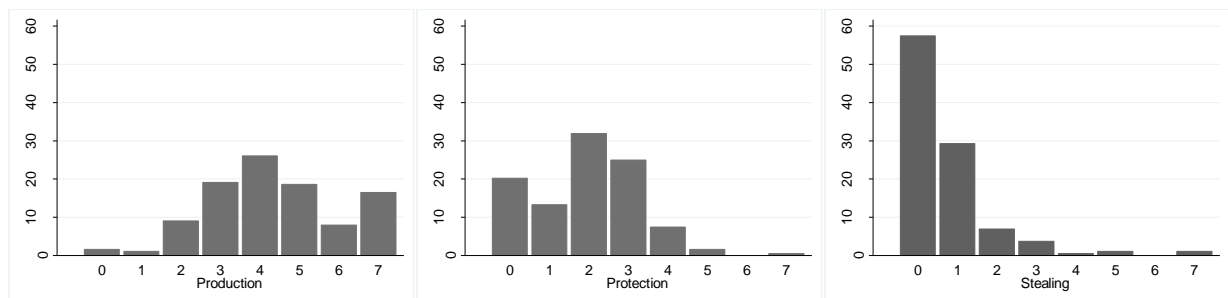
⁷ Alternatively we estimated models including the Big Five personality measures, a measure for association membership, and outgroup trust. The personality characteristics are measured in the World Values Survey according to Muck, Hell, and Gosling (2007). Previous research (Lu & Argyle, 1991; Asthon, Jackson, Helmes, & Paunonen, 1998) has shown that extraversion and agreeableness are positively correlated to cooperation, whereas neuroticism is negatively linked to cooperative behavior. Moreover, Volk, Thöni, and Ruigrok (2011) find that participants who scored higher on agreeableness are more likely to have stable cooperation preferences. In our data we do not find any strong relationship between cooperation and personality traits. Association membership measures voluntary group membership in various organizations (sport, recreation, art, music, educational, environmental, humanitarian, charitable organization). Again we find no significant effect on behavior in the public goods game. Finally we included a measure for outgroup trust in the estimates. Outgroup trust is based on the question about trust in people you meet for the first time, people of another religion, and people of another nationality. Outgroup trust seems to be positively linked to the amount contributed in the public goods game. This result is consistent with the observation in our main analysis.

Overall we observe a positive relation between trust, emancipative values and contributions to the public good, which is robust to the inclusion of different control variables. Both with and without the additional controls the models that include moral values explain more variance than the models with the simple trust and civic norms measures.

Production and Protection in the Property Rights Game

In total, 188 participants completed the property rights game.⁸ On average participants spend 4.37 units (62%) on production with a standard deviation of 1.66.⁹ Histograms of the allocation of the resources to production, protection, and stealing are shown in Figure 4.

Figure 4. Allocation of the resources in the property rights game.



In the following analysis we focus on production and protection. Since participants have to distribute all seven units, the resources invested into stealing can be derived from the other two actions. Table 2 shows regressions with robust standard errors to analyze the relationship between production, and our covariates from the survey. Similar to the public goods game, we find that the production decision is positively related to trust, but not to the attitude towards civic norms (model (1)). A person who trusts allocates roughly 0.6 units more to the productive activity. In model (2) we observe a strong relationship between production and secular values, but not between emancipative values and the behavioral measure. We observe that subjects who score one standard deviation higher on the secular values, allocate on average 0.33 units more to production. For both models, the effect and its size are robust to the inclusion of political and demographic control variables (model (3) and (4)). The political variables do not seem to be related to productive activity.¹⁰ Overall, we find that both, trust and the secular values have robust predictive power for the production decision in our property rights game.

⁸ The game consisted of two consecutive allocation decisions. In this paper, we keep the focus on the first decision.

⁹ Our results are comparable to the results by Campos-Ortiz et al. (2012), where participants spent roughly 43% of their endowment for production.

¹⁰ The personality traits, openness to experience seems to be positively related to production: respondents who rate themselves to be open to experience allocate more resources to production. Moreover, including association membership and outgroup trust does not reveal further information.

Table 2. OLS Estimates for Production

	(1) Production	(2) Production	(3) Production	(4) Production
Trust	0.591** (0.244)		0.561** (0.260)	
Civic norms	-0.140 (0.132)		-0.197 (0.141)	
Emancipative values		0.163 (0.158)		0.139 (0.178)
Secular values		0.329** (0.133)		0.350** (0.140)
Political interest			0.016 (0.152)	0.084 (0.155)
Left-right			-0.078 (0.210)	0.013 (0.218)
Female			-0.104 (0.278)	-0.110 (0.285)
Age			0.010 (0.008)	0.011 (0.008)
Constant	4.069*** (0.157)	4.187*** (0.142)	3.724*** (0.444)	3.809*** (0.438)
F-test	3.5	4.5	1.6	2.3
Prob > F	0.033	0.012	0.147	0.040
R ² adjusted	0.026	0.037	0.015	0.027
N	182	183	172	173

Notes: OLS estimates. Dependent variable is production [0,7]. Independent variables are standardized except for age, female and trust. Female and trust are dummy variables. Political interest measures how interested a person is in politics. Left-right indicates where a person positions herself with regards to left and right on a scale from 0 to 10, lower numbers indicating left, higher numbers right. Robust standard errors in parentheses. * p<0.1, ** p<0.05, *** p<0.01.

In the next step we analyze the protection decision. As mentioned above, devoting resources to protection is not part of an equilibrium. However, if excessive stealing is expected, allocating three or four units to protection is a best response. We observe that 80% of participants allocated at least one working units to protection. On average 1.94 units (standard deviation: 1.33) are devoted to protection.¹¹

The multiple regression analyses in Table 3 show a different pattern to that of production behavior for the evaluation of the link between social capital and the protection decision. In model (1) we find trust to be weakly linked to protection. When including the control variables, we observe the attitude towards civic norms to be colligated to the protection decision. Interestingly people with a higher score on the civic norms tend to protect more (model (3)). In model (2) we look at the link between moral values and the protection decision. Participants, who score high on secular values, use significantly less resources for protection. We find that an increase of secular values by one standard deviation leads to a decrease of protection of roughly 0.35 units. Including the control variables for age, gender, political interest, and ideological orientation does not change the observed effects.¹²

¹¹ In Campos-Ortiz et al. (2012) participants spent on average about 30% of the resources for protection.

¹² As mentioned in section "Contributions to the Public Good", some of the personality traits are weakly correlated to secular values, thus by adding these variables to the regression

Table 3. OLS Estimates for Protection

	(1) Protection	(2) Protection	(3) Protection	(4) Protection
Trust	-0.325* (0.196)		-0.348 (0.214)	
Civic norms	0.174 (0.107)		0.206* (0.113)	
Emancipative values		-0.013 (0.132)		0.001 (0.144)
Secular values		-0.348*** (0.118)		-0.359*** (0.125)
Political interest			0.114 (0.113)	0.043 (0.113)
Left-right			0.095 (0.162)	0.036 (0.165)
Female			0.023 (0.227)	-0.001 (0.230)
Age			-0.009 (0.007)	-0.008 (0.007)
Constant	2.105*** (0.126)	2.034*** (0.113)	2.416*** (0.374)	2.353*** (0.366)
F-test	2.8	5.3	1.5	2.1
Prob > F	0.066	0.006	0.183	0.052
R ² adjusted	0.018	0.049	0.009	0.035
N	182	183	172	173

Notes: OLS estimates. Dependent variable is protection [0,7]. Independent variables are standardized except for age, female and trust. Female and trust are dummy variables. Political interest measures how interested a person is in politics. Left-right indicates where a person positions herself with regards to left and right on a scale from 0 to 10, lower numbers indicating left, higher numbers right. Robust standard errors in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

To conclude, we observe that behavior in the property rights game is tightly associated to secular values. Participants, who score high on those values, allocate on average more resources to production and use fewer resources to protect. Consequently, the higher the score on secular values, the closer a participants' behavior to the socially optimal behavior. Interestingly, while we observe that secular values are linked positively to production and negatively to protection, they are not significantly linked to stealing.

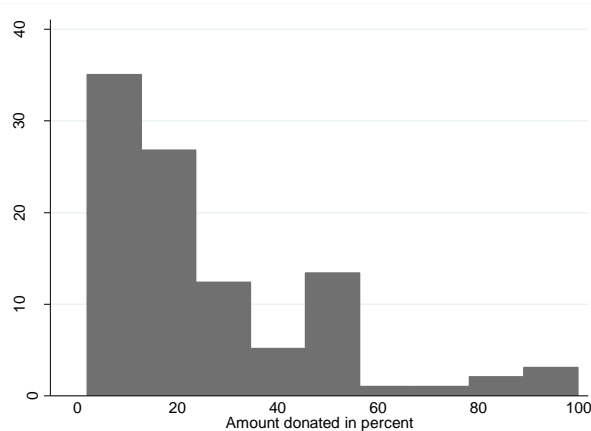
Donations

We observe behavior in the donation decision for 179 subjects. On average participants are willing to donate 14.4 percent of their potential income to a charity. A bit more than half of the participants (54 percent), are willing to donate. Among the participants who donated, the mean donation is 26.6 percent. Figure 5 shows a histogram for the percentages chosen, conditional on having donated a positive amount.¹³

(model (4)), the coefficient for secular values becomes a little less significant and decreases slightly. As in the previous section, we do not observe a link between association membership, outgroup trust and behavior in the property rights game.

¹³ Mean donations are rather low, compared to the results observed in Benz and Meier (2008), where participants donate on average 65% of their earnings. However, in this experiment

Figure 5. Histogram of the Amount Donated



To investigate the link between behavior and values, we applied again multiple OLS regressions. Table 4 depicts the results. In model (1) we regress the amount donated (as percentage) on trust and civic norms. Both variables account for some variance of the dependent variable. The coefficient for trust indicates that subjects who trust donate on average 7.1 percentage points more. An increase of one standard deviation in civic norms leads to an increase in the amount donated of about five percentage points. In model (3) we include our standard controls and observe that trust is no longer significant. The coefficient for civic norms is still highly significant but the effect size decreases. In model (2) we regress the amount donated on emancipative and secular values. We find that emancipative values have strong explanatory power for the donation decision. Participants with a higher score on the emancipative values are willing to donate significantly more. The effect is robust to the inclusion of our control variables (model (4)). In addition, we observe a strong relationship between age and donation: the older a person, the higher the donation, on average. Furthermore, in both extended models (3) and (4) we find a positive and significant link between the donation decision and political interest. In other words, the more interested a person is in politics, the more the person is willing to donate to charity.¹⁴

participants could donate from an extra endowment, instead from their experimental earnings. In a design very similar to ours (with a student sample) Schulz et al. (2015) find about 44 percent willing to donate and 16.3 percent of the earnings donated on average.

¹⁴ Additionally we included the personality traits into the regression (results not reported in the table). However, we do not observe any significant link between the donation decision and the Big Five personality traits. The same holds true when we include association membership and outgroup trust. These variables do not seem to be significantly linked to the amount donated.

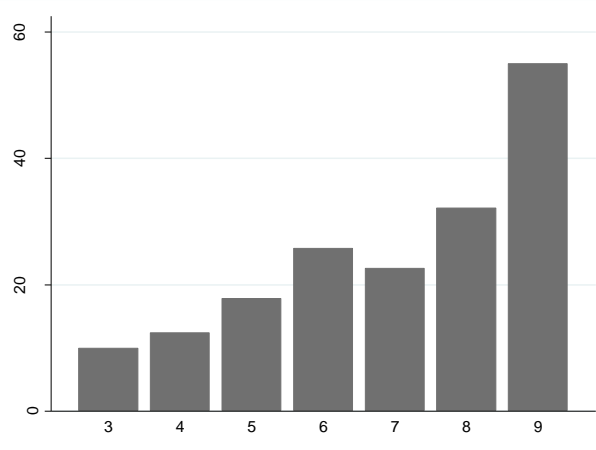
Table 4. OLS Estimates for Donation

	(1) Donation	(2) Donation	(3) Donation	(4) Donation
Trust	7.142** (3.114)		3.600 (3.427)	
Civic norms	5.226*** (1.063)		3.275*** (0.985)	
Emancipative values		5.720*** (1.879)		4.380** (1.701)
Secular values		-2.155 (1.773)		-1.875 (1.575)
Political interest			3.077** (1.512)	2.751** (1.329)
Left-right			-2.484 (2.214)	-1.711 (2.246)
Female			-3.296 (3.384)	-4.426 (3.455)
Age			6.320*** (2.178)	7.061*** (2.006)
Constant	11.415*** (2.244)	12.180*** (1.376)	16.719*** (3.963)	17.368*** (2.834)
F-test	15.0	4.7	6.0	3.7
Prob > F	0.000	0.011	0.000	0.002
R ² adjusted	0.067	0.038	0.153	0.157
N	172	173	162	163

Notes: OLS estimates. Dependent variable is donation [0,100]. Independent variables are standardized except for female. Political interest measures how interested a person is in politics. Left-right indicates where a person positions herself with regards to left and right on a scale from 0 to 10, lower numbers indicating left, higher numbers right. Robust standard errors in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Overall, the effect size of emancipative values on donation is in the magnitude of an increase between 4.4 and 5.7 percentage points per standard deviation. If we estimate the link between the donation decision and the values only with the sample of people who donate, the results stay the same, but effect size increases to roughly 7 percentage points. Figure 6 shows a bar chart of the average donations for multiple categories of our measure for emancipative values.

Figure 6. Emancipative values and donations. The figure depicts means of the amount donated in each category. Emancipative Values are categorized in the following way: 3:0.2-0.3, 4:0.3-0.3, 5:0.4-0.5, 6:0.5-0.6, 7:0.6-0.7, 8:0.7-0.8, 9:0.8-0.9. The scale starts at 3 as we do not observe participants who donated, with a value lower than 0.2



Summing up, for the donation decision we observe a positive relationship between the amount donated and the emancipative values and adherence to civic norms. Our results provide further evidence to the discussion whether moral values are classified as civic or non-civic (Welzel, 2010). Compared to previous research, our measure of altruism has the advantage that it reflects actual donation decisions. Hence, our analysis supports the hypothesis that self-expression values are linked to civic behavior.

CONTROLLING FOR SAMPLE SELECTION BIAS

At the beginning of the section “Results” we mentioned that women and young people are overrepresented in our experimental sample when compared to the population of WVS respondents. To control for a potential sample selection bias we apply the Heckman method (Heckman, 1979).¹⁵ The first step of the Heckman correction is to calculate the individual probability to belong to the selected sample, by estimating a probit model. Second, the inverse Mill’s ratio is predicted by using the estimated coefficient of the selection equation. Subsequently the original regression is estimated, using the inverse Mill’s ratio as a regressor.

Crucial to the application of this method is the identification of the selection equation. In practice this means that the selection equation has to include at least one variable which matters for selection, but is not related to the outcome variable (exclusion restriction). Ideally, this variable does not come from the respondent’s answers or characteristics. Fortunately we have a variable which strongly predicts participation but is, most likely, unrelated to the outcome variable. The variable is a measure for an interviewer’s success in motivating the respondents of the World Values Survey in participating in the online study. The WVS interviews were conducted by 134 different interviewers. For each interviewer we calculate an individual success rate as the total number of

¹⁵ We calculated all models with the Heckman two-step method. The results point all into the same direction. In the following we only show the results for the simpler models.

email addresses collected, divided by the total number of interviews conducted. Interviewers differed a lot in their success rate (mean: 0.24; SD: 0.22; min: 0; max: 1). This variable is highly related to selection into the online sample but unlikely to be related to the dependent variables of interest. Participants who indicated their email address are more likely to participate in our online study, because we were able to send them a direct link to the study. On the other hand, the success rate of the interviewer is not likely to be related to, for example, individual contribution in the public goods game.¹⁶

Table 5 compares the results for the OLS and the Heckman models for contribution, production, and protection. In all three cases OLS and Heckman produce similar results, indicating that our results are not driven by selection bias. We also estimated the Heckman models for the donation decision. Similar to the results reported above, we find no indication that our results are driven by selection.

Table 5. Comparison of OLS and Heckman estimates

	Contribution		Production		Protection	
	OLS	Heckman	OLS	Heckman	OLS	Heckman
Emancipative Values	24.079* (12.612)	30.382** (13.680)	0.864 (1.073)	1.047 (1.014)	-0.081 (0.886)	-0.231 (0.811)
Secular Values	15.365 (12.567)	15.365 (12.586)	2.218** (0.908)	2.350** (0.916)	-2.200*** (0.812)	-2.339*** (0.741)
Female	-3.424 (3.418)	-3.704 (3.548)	-0.202 (0.265)	0.001 (0.011)	0.047 (0.214)	0.000 (0.008)
Age	.006 (.106)	-.115 (.118)	0.007 (0.008)	-0.125 (0.268)	-0.005 (0.006)	-0.020 (0.213)
Income	.568 (.765)	.243 (.780)	0.060 (0.060)	0.044 (0.058)	0.001 (0.045)	0.015 (0.046)
Constant	31.889*** (9.840)	29.761*** (10.654)	2.403*** (0.729)	2.089** (0.835)	3.120*** (0.604)	3.397*** (0.657)
F-test	1.91	9.94	2.84	10.93	2.42	11.53
Prob > F	0.092	0.077	0.017	0.053	0.037	0.042
R ² adjusted	0.035		0.063		0.059	
N	248	248	185	185	185	185

DISCUSSION

Our study is the first of its kind to examine the individual-level linkage between moral values and cooperative behavior. We observe a distinct pattern; first, trust seems to be important for decisions, which rely on the behavior of another person. In contrast, when the decision does not depend on the behavior of another person, trust is not predictive. For the moral values we have shown convincing evidence for three tendencies: (a) emancipative values motivate higher shared contributions, (b) stronger secular values inspire more productive and less protective investments and (c) emancipative values lead to higher donations. These tendencies proved robust when controlling for bias, demographic characteristics, public interest, ideological orientations as well as personality traits.

¹⁶ We do not observe any statistically significant correlation between our dependent variables and the individual success rate of the interviewer. Hence, the use of individual success rate as exclusion restriction seems appropriate.

Among these tendencies, tendency (c) proved particularly strong and stronger than tendency (a). In other words, the hypothesized altruistic impetus of emancipative values is more obvious when it comes to charity donations than when it comes to shared contributions. This is explicable insofar as charity donations are a more altruistic act than shared contributions: what you donate is definitely lost; what you give to sharing is still shared, even if this happens at a lower return.

Also, charity donations represent better universal altruism because the recipients are completely anonymous. Shared contributions, by contrast, represent cooperation with a very specific other. Hence, Welzel's argument that emancipative values correspond especially with universal altruism is confirmed, for the German context at least.

One should note that the altruistic effect of emancipative values is already partly obscured by the fact that more people with emancipative values participated in the cooperation game. This leads to a curtailed variance in emancipative values: Figure 6 has shown that people at the lower end of emancipative values did not participate, even though they are present in the larger sample. Clearly, it is more difficult to find an effect of emancipative values when these values do not cover the full possible range of variation. We found it nevertheless, which speaks to the robustness of this effect.

Furthermore, secular values show a more limited impact than emancipative values—an impact that only shows up with respect to property rights: merely protective investments with respect to property becomes less likely under stronger secular values. This finding might reflect the fact that secular values thrive under existential security: feelings of existential security should make people less protection-oriented.

Moreover, our analysis confirms that social capital is linked to individual behavior. Specifically, trust is related to cooperative behavior in the public goods game and the production decision in the property rights game. By contrast, adherence to civic norms is only associated with the donation decision, both of which in turn might be driven by social desirability norms. This would explain the link between the two.

To conclude, we are convinced that behavioral experiments can contribute substantially to the body of evidence in the field of cross-cultural research. Experiments should be seen as a complementary tool to survey studies and other data sources. A key strength of the method is that the experiments depart from a well-defined game, which relies on formal rules and mathematical functions. We argue that this allows to mitigate the issues with equivalence. We see our study is a promising first step to extend this research design to more countries covered in round seven of the WVS. This would allow to examine if and how the individual-level linkages between moral values and cooperative behavior vary by cultural background and country-level characteristics.

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