Survey Response and Observed Behavior: Emancipative and Secular Values Predict Prosocial Behaviors

Deborah Kistler¹, Christian Thöni¹, and Christian Welzel²,³

Abstract
Since decades, cross-cultural psychology examines moral values using data from standardized surveys, assuming that values guide human behavior. We add to this literature by studying the link between moral values and various forms of prosocial behavior, using data from respondents of the sixth World Values Survey in Germany who participated in an online behavioral experiment. The experiment consists of a series of incentivized tasks and allows us to elaborate the association between survey-measured values and three facets of observed prosocial behavior. The evidence boils down to three findings. While (a) emancipative values relate to higher common pool contributions and (b) higher donations to charitable organizations, (c) secular values are linked with more productive and less protective investments. As these results conform to key theories and reach empirical significance in a major postindustrial nation, we conclude that we have important evidence at hand highlighting the potential of combined survey-experiment methods to establish value–behavior links that are otherwise inexplorable.

Keywords
values, behavior, experiment, survey, equivalence, cooperation, prosocial behavior, property

Introduction
It is widely understood that cooperative behavior among strangers is a key ingredient of thriving societies in which institutions function impartially (Axelrod, 1986; Bowles & Gintis, 2011; Coleman, 1990; North, Wallis, & Weingast, 2009; Ostrom, 1990). The willingness to behave prosocially—to forgo individual gains for the benefit of others—differs considerably across societies and individuals (Gächter, Herrmann, & Thöni, 2010). Understanding the determinants and origins of prosocial behaviors is of central interest to all social sciences.

In this study, we investigate the role of moral values for prosocial behavior. Research in social psychology suggests that values guide prosocial behavior (Axelrod, 1986; Eckstein, 1966, 1998; Inkeles, 1969, 1983; Kluckhohn, 1951; Putnam, 1993, 2000; Rokeach, 1968, 1973; Welzel, 2010). Indeed, there is convincing evidence that “benevolence” and “universalism” values are

---

¹University of Lausanne, Switzerland
²Leuphana University of Lüneburg, Germany
³National Research University Higher School of Economics, Moscow, Russia

Corresponding Author:
Christian Thöni, University of Lausanne, UNIL-Dorigny, 1015 Lausanne, Switzerland.
Email: christian.thoeni@unil.ch
related to prosocial behavior (Bardi & Schwartz, 2003; Sagiv, Sverdlik, & Schwarz, 2011). According to these findings, people who express concern for the well-being of others are more prosocial (cf. Schwartz, 2004, 2006, 2007).

In a separate strand of scholarship, Inglehart, Norris, and Welzel focus on two particular sets of moral values that grow stronger as the living conditions of the bulk of a population improve: secular values and emancipative values (Inglehart & Norris, 2003; Inglehart & Welzel, 2005; Norris & Inglehart, 2004). These values are indeed indicative of a host of life quality indicators, from subjective well-being to life expectancy to education, information access, income equality, physical security, rule of law, democracy, social capital, and ecological sustainability (Inglehart & Welzel, 2005, 2010; Welzel, 2013; Welzel, Inglehart, & Klingemann, 2003). The emergence of these two sets of values is described as a psychological reaction to the societal transformations that modernization brings about.

Welzel (2013) 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. The egalitarian component of these values has a strongly antidiscriminatory impetus that favors a deeper internalization of impartiality norms. Welzel (2013) hypothesizes that the antidiscriminatory and humanitarian tendency of emancipative values predisposes their carriers to prosocial behavior vis-à-vis strangers (cf. Welzel, Inglehart & Deutsch, 2005; Welzel & Delhey, 2015).

As concerns secular values, scholars working in the Inglehart–Welzel framework did not phrase explicit hypotheses about these particular values’ behavioral consequences. The evidence, however, that secular values emerge from feelings of existential security suggests various hypotheses. Perhaps, the most intuitively plausible expectation deriving from secular values’ link to existential security is that secular oriented people avoid protectionist behavior. Inglehart and Welzel’s theory also posits that existential security reduces people’s fear of foreigners, which suggests that secular values ease cooperation with strangers.

However, secular values by definition involve lower religiosity. Accordingly, these values’ impact on behavior should reflect how religiosity affects behavior. Shariff (2015) provides an overview of studies that see religiosity as a force encouraging prosocial behavior. From this point of view, one would assume that—because of their inverse relation to religiosity—secular values are negatively linked with prosocial behavior. Shariff’s study clarifies, however, that the relationship between religiosity and prosocial behavior only holds for self-reported measures of prosocial behavior and vanishes when prosocial behavior is measured by observation. Galen (2012) supports this conclusion. In light of this evidence, the antireligious impetus of secular values should be neutral as concerns these values’ influence on observed prosocial behavior. By contrast, the alleged absence of existential fear among secular oriented people should encourage prosocial behavior. Overall, we thus hypothesize a modestly positive link of secular values with prosocial behavior. Our clearest expectation with respect to secular values, however, is that they discourage protectionist behavior.

So far, the claim that secular and emancipative values influence prosocial behavior has only been demonstrated for activities that respondents self-report in surveys (Welzel & Deutsch,
Kistler et al. (2012) but never for directly observed behavior. With this study, we close this gap. We investigate the link between our predictor variables (secular and emancipative values) and outcome variables, measuring three facets of prosocial behavior: (a) cooperation in a social dilemma game, (b) productive versus protectionist investments in a property rights game, and (c) donation to charity. We test the hypotheses that, while (a) emancipative values show a strongly positive association with prosocial behaviors, (b) secular values show a modestly positive association, (c) at the same time as they associate strongly negatively with protectionist behavior.

The dominant explanation of prosocial behavior by far is social capital, which is supposed to facilitate interactions between strangers (Coleman, 1990; Knack & Keefer, 1997; Putnam, 1993). While definitions of social capital vary, scholars routinely include interpersonal trust and adherence to civic norms. In contrast to the research on values, there exists an extensive literature investigating the link between standard social capital measures and behavior 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. In experiments similar to the public goods game reported in this study, Gächter, Hermann, and Thöni (2004) find only weak evidence for the relation between trust questions and cooperation, while Thöni, Tyran, and Wengström (2012) find a positive link between trust and cooperative behavior in a large and representative sample of the Danish population. Balliet and Van Lange (2013) survey a large number of studies on prisoner’s dilemma and public goods games and find a small to moderate positive relation between dispositional trust and cooperation. In this study, we are not interested in the influence of social capital per se. Instead, we include social capital to see whether the influences of our interest—emancipative and secular values—withstanding its control.

To investigate our hypotheses, we invited the respondents of the sixth round of the World Values Survey (WVS) in Germany to participate in an online behavioral experiment. This allows us to link the respondents’ moral values, as measured by the WVS, to the same respondents’ prosocial behavior, as observed in the behavioral experiment. Germany is a relevant and insightful case for our study. The country includes the biggest national population in Europe and constitutes the fourth-largest economy in the world. It is also a nation with the typical features of postindustrial knowledge societies, arguably the most advanced type of society in human history (Inglehart & Welzel, 2005). What we find here in terms of value–behavior links is presumably representative for a wider set of countries at the forefront of modernization.

Moreover, Germany incorporates cleavages of more general interest from a cross-cultural point of view. For one, there is the North–South cleavage between historically Protestant and Catholic regions that characterizes the whole of Europe. No question, secularization, urbanization, and migration have blurred this historic division but culture is an inert force that leaves a lasting imprint. Since the writings of Max Weber, the literature has attributed Protestants a stronger tendency to cooperate with strangers than Catholics.

Equally important, there is the East–West cleavage between ex-communist and market-capitalist societies that is also of a more general cross-cultural relevance, with the East having experienced 40 years of a Soviet-type dictatorship. In light of this division, the literature on “homo Sovieticus” (Kuran, 1997) suggests that “Easterners” tend to trust strangers less and to cooperate to a lesser extent.1

Germany embodies these cultural cleavages in a single nation, which allows to study cross-cultural issues while retaining comparability of individuals at a maximum level, as they all belong to the same national culture. Taking advantage of this specific context, we test two sub-hypotheses: (a) West German respondents behave more prosocially than those from East Germany, and (b) Protestants behave more prosocially than Catholics.

The remainder of this article proceeds as follows: the “Methodological Advantage of Behavioral Experiments” section outlines the added value of combining a behavioral experiment
with a nationally representative survey; the “Design and Procedures” section describes the design and procedures; the “Results” section presents the findings; finally, the “Discussion” section concludes.

**Methodological Advantage of Behavioral Experiments**

In a seminal article, Brislin (1970) pointed out that one of the major challenges of cross-cultural research is to ensure equivalence across different languages. Besides language, context differs considerably between cultures, which also reduces equivalence (see also Hui & Triandis, 1985). While the task description of our behavioral experiment still relies to some degree on natural language, we argue that the use of behavioral experiments (Camerer, 2003; Camerer & Fehr, 2004) mitigates the equivalence problem substantially. The reason is that the underlying strategic situation is a well-defined game, that is, it consists of a set of formal rules and mathematical functions. These rules and functions are independent of the cultural context and the language of exposition. Hence, such well-defined formal games facilitate the comparison of outcomes across cultures (Gächter et al., 2010; Herrmann, Thöni, & Gächter, 2008).

As a methodological contribution, we develop a novel instrument for an Internet-based behavioral experiment. Key advantages of this tool relative to standard methods in experimental research are (a) high flexibility in terms of the number of participants, their educational background, their local and timely availability; (b) easy adaptation to other participant pools with different languages; and (c) relatively low administrative costs. Furthermore, our experiment does not require a laboratory because respondents can participate from any Internet-connected device. For these reasons, our behavioral experiment is ideally suited for cross-cultural research in combination with opinion surveys like the WVS. 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.

**Design and Procedures**

Our main sample consists of respondents who participated in two studies. First, they were interviewed for the WVS in Germany. Their responses in the WVS serve as independent variables of our study. At the end of the WVS interview, we invited all respondents to participate in our online behavioral experiment, which measures three facets of prosocial behavior that form our dependent variables. In this section, we describe our data sources and procedures in detail.

**WVS**

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 adult residents, with a minimum sample size of 1,000 people per country. Fieldwork is usually conducted through face-to-face interviews. Average interview length is about 50 min. Thus far, the EVS/WVS has conducted some 300 national surveys in by now 106 societies that represent more than 90% of the world population. Further details on fieldwork, sampling, questionnaires, as well as downloadable data sets are available at www.worldvaluesurvey.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 60 societies. As part of this project, the sixth German WVS was fielded in fall 2013. Roughly, 2,000 interviews have been realized.
Moral Values

Emancipative values and secular values are each measured on the basis of 12 items from the WVS. The 12 items of secular values measure distance from sacred authority in the domains of religion, the nation, the state, and group pressures. The 12 items of emancipative values measure an emphasis on equal freedoms in the domains of personal autonomy, gender equality, the voice of the people, and sexual liberty. These items are combined in a “formative index” procedure, as documented in Welzel (2013, pp. 57-73). These pages also document the cross-cultural validity of these measures as well as their approximately normal distribution. Index scores vary from minimum 0 to maximum 1 on both value indices. The original wording (from the English master questionnaire) and response format of all items used to create the secular and emancipative values are reported in the appendix.

Measures of Social Capital

Trust is measured using the question “Generally speaking, would you say that most people can be trusted or that you need to be very careful in dealing with people?” from the WVS. The answer is binary, that is, either “most people can be trusted” or “need to be very careful.” For civic norms, we use four items in which respondents indicate whether they find the following behaviors acceptable: (a) “claiming government benefits to which you are not entitled,” (b) “avoiding a fare on public transport,” (c) “stealing property,” and (d) “someone accepting a bribe in the course of their duties.” Answers to these items are given on a scale from 1 (never justifiable) to 10 (always justifiable). We average the four items to our measure for civic norms (Cronbach’s α = .74).

Further Control Variables

In all our regression models, we include age, gender, political interest, and left-right orientation as control variables. Political interest is measured on a 4-point Likert-type scale ranging from very interested to not at all interested. Left-right indicates a person’s self-reported political position on a scale from 1 to 10, with lower numbers indicating left and higher numbers right.

Behavioral Experiment

At the end of the WVS interview, all participants were invited to participate in the behavioral experiment. They received a flyer with information about the procedures of the behavioral experiment, the possibility of earning money, and the login information. Each participant received a unique and randomly generated six-digit login code. We use this code to match the answers in the WVS questionnaire to the behavioral data. The behavioral experiment consists of several decision tasks: a public goods game, a property rights game, and a donation decision. The ordering of the tasks is the same for all participants. We administered the behavioral experiment online and designed it such that no real-time interaction among the participants is necessary. For all decision tasks, involving more than one participant, we matched participants into groups only at the very end of the data collection period. This procedure allows participants to answer the questions at their convenience, that is, they can quit the behavioral experiment anytime and continue at a later point in time.

Following the methodological standards for behavioral experiments, we offer monetary incentives for all decision tasks. Participants’ earnings are calculated in an experimental currency unit (ECU; in the experiment we speak of “Talers”). At the beginning of the experiment, participants were informed about the payment procedures. First we communicated the exchange rate from ECU to the local currency, which was 1 ECU to 4 Euros. Second, we explained the random draw.
In each decision task, the amount of ECU depends on the participant’s decision, and—in case of group decisions—on the decision of the other group member (another randomly selected participant). For each task, we randomly drew a participant to receive the amount he or she earned in the given task. In case the task was a two-player game (public goods game and the property rights game), we randomly drew another participant as the partner. Hence, for these games, we randomly selected a group, for which both participants received the earnings from the decision task. The donation decision became payoff relevant for the participants who had been randomly selected to get paid for one of the other decision tasks. For these participants, we subtracted the percentage according to their donation decision and transferred the money to the charity indicated by the participant. The four participants who have been selected for payment in the public goods game and the property rights game, earned on average €400 (minimum = €208, maximum = €640).

Public Goods Game

The public goods game is a standard tool in experimental economics to elicit cooperative behavior (Ledyard, 1995). In our case, we randomly group players in pairs of two. Each player is endowed with 100 ECU and has to decide how many ECU to contribute to a common pool, called the group account, that is, they simultaneously choose a contribution $c_i \in \{0, 20, \ldots, 100\}$. The contributions of both players are summed up and multiplied by 1.5. The resulting amount is returned to the two players in equal shares. Thus, independent of a player’s contribution he or she is entitled to half of the amount in the group account. The payoff function of player $i$ in a group with player $j$ is

$$\pi_i = 100 - c_i + \frac{1.5}{2} (c_i + c_j).$$

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. Individual rationality commands a contribution of zero because each ECU contributed to the group account yields only 0.75 ECU in return. However, the fact that the other player also receives 0.75 ECU for every ECU contributed means the social return is 1.5 and thus collective rationality calls for full contribution by both players. Much like the famous prisoner’s dilemma, this game models a social dilemma.

In the design of the behavioral experiment, we paid great attention to guide participants carefully through the procedures and to give instructions that are intuitive and easy to understand. Interactive graphs illustrate the key features of the game. 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 interactive graph. Participants can go back and forth between the bullet points. Second, participants are shown the payoff consequences of three possible outcomes of the game (both players contribute zero; both players contribute 100; one player contributes 60 and the other player contributes 100). Third, participants proceed to 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. Participants who provide an incorrect answer are asked to try again two times. Finally, participants choose their contribution and proceed to the next game.

Property Rights Game

The second decision task aims to capture the strategic situation in an environment with weak external enforcement of property rights. In all modern societies, formal institutions govern
protection of property rights. Nonetheless, we observe considerable amounts of private investment in protection of property, suggesting that formal protection is imperfect. Under these circumstances, populations can either coordinate on efficient situations with high mutual respect for property, or they can coordinate on very inefficient situations with mutual distrust and high private investments in protection.

Like in the public goods game, players are randomly paired into new groups of two. To facilitate understanding, we give the property rights game an agricultural framing, in which participants act as “farmers” who can allocate resources (“working hours”) to production, protection, and stealing. In the graphical representation of the game, production refers to planting carrots in fields, and we refer to stealing in a neutral way and label it as “taking.” Depending on their decisions and those of their paired counterpart, players end up with more or less carrots. The monetary payoff of the game is equal to the number of carrots they acquire, with each carrot being worth one ECU. Planting carrots is the only productive activity; the other two activities affect only the distribution of wealth. Participants have seven fields to plant carrots and seven units of resources, and they receive a monetary endowment. Players simultaneously allocate their resources to production, protection, and stealing. Similar to the public goods game, participants go through four stages of learning and exploring the game. All parts are accompanied by interactive graphics. Figure 2 shows the screen in the exploration stage.

The three activities, production, protection, and stealing have the following payoff implications: each resource for production yields a carrot on each of the seven fields. The marginal return is thus seven ECU if the other player does not steal some of the player’s fields. Each resource unit allocated to protection builds a fence around one field, which protects this field against theft. Each unit allocated to stealing results in the annexation of the crop of one field of the other player (the hands in Figure 2), up to the number of unprotected fields. Stealing starts from above, protecting starts from below, that is, if a player allocates a unit to stealing, then the first field stolen is the field at the top of the screen. The next field stolen is the one to the left in
the second row and so on. If a player allocates a unit to protection, then the first field protected is the one at the very bottom of the screen. The next field protected is the one to the right in the second last row.

The marginal return of stealing depends on the allocation of resources of the other player. If the other player allocates all her resources to production, then stealing a field yields seven ECU. In case the other participant does not allocate any resources to production, his fields are empty and stealing provides no benefit.

Under standard assumptions, a player’s best response is to allocate all her resources to production and stealing if the other player does not protect and allocates less than six units to stealing. If the other player allocates six or more units to stealing, then the best response is to protect three or four fields and use the remaining resources for production. In case the other player protects (and allocates less than six units to stealing), there is a unique best response to allocate all the resources to production. In brief, a player protects if she expects excessive stealing. She allocates all resources to production if she expects some (minimal) degree of protection, and she is indifferent between stealing and production 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 production and stealing, 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. Coordinating on the Nash equilibrium without stealing and without protection is
desirable because it maximizes total surplus. Protection cannot be part of an equilibrium, because player $i$’s best reply to protection by player $j$ is not to steal. But if $i$ does not steal, then it is not the best reply for $j$ to protect.

Our design of the property rights game is similar to Ahn et al. (2016) who study a repeated game in a laboratory environment. Related are also Wilson, Jaworski, Schurter, and Smyth (2012) and Kimbrough, Smith, and Wilson (2010), who show in a series of production and consumption experiments that property rights are respected most when they emerge as informal agreements within civil minded groups.

**Donation Decision**

The third decision task provides us with a measure for altruism. In the final task of the behavioral experiment, 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 and decisions of others, therefore participants do not 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 (World Wildlife Fund [WWF], Amnesty International, Red Cross, Doctors Without Borders) or indicate another charitable organization of their choice.

**Results**

In total, 252 respondents participated in the behavioral experiment, of whom 55.6% are women. This compares with 50.4% women in the full German WVS sample. Participants are on average 7 years younger in the behavioral experiment sample ($42.5, SD = 15.2$), compared with the WVS sample ($49.5, SD = 17.7$). We address the issue of self-selection bias in the section, “Controlling for Sample Selection Bias.” Over the course of the behavioral experiment, dropout leaves us with 179 participants who completed the entire behavioral experiment. Women finish the experiment more often than men do ($p = .056, \chi^2$-test). Apart from that, we find no systematic differences between dropouts and finishers.

Table A1 in the appendix provides an overview of the zero-order correlations of all our predictor and outcome variables. Emancipative values correlate positively with secular values ($r = .273, p < .001$) and trust ($r = .077, p < .001$). Moreover, secular values correlate negatively with civic norms ($r = -.527, p < .001$). Finally, trust and civic norms correlate only weakly with each other ($r = .041, p = .067$). We present our results starting with the public goods game, followed by the property rights game, and finally the donation decision.

**Contributions to the Public Good**

A total of 252 respondents participated in the public goods game. The mean contribution is 55.1 out of 100, with a standard deviation of 25.4. Figure 3 shows the histogram of the contributions. Only four participants (1.6%) contributed zero. Compared with other public goods games, the proportion of minimum contributors is surprisingly low in our data. In an online experiment in Denmark, with a randomly selected sample from the population, Thöni et al. (2012) observe that 15% of the participants contribute zero. However, the average contribution is lower than in the Danish sample, where participants on average contribute 70% of their endowment.

To investigate our hypotheses, we conduct multiple regression analyses. We use ordinary least squares (OLS) estimates with robust standard errors to regress a participant’s contribution on
her or his values, trust, civic norms, and demographic characteristics. Because of missing responses in some of the predictor variables, we lose some observations ($N = 245$). Model 1 shows the link between emancipative and secular values on one hand and the contribution to the public good on the other hand. For better comparability of the estimates, we normalized all non-binary predictor variables. Increasing emancipative values by one standard deviation weakly significantly increases the contributions by 3.5 units ($t = 1.84$, $p = .066$). Secular values are not significantly linked with the contribution decision. Due to multicollinearity between the predictor variables, the relationship between emancipative values and the contribution to the public good is underestimated. Indeed, a simple linear regression using emancipative values as the only explanatory variable reveals a significant link with the contribution decision ($\beta = 4.23$, $t = 2.31$, $p = .021$). These results provide evidence for the predictions by Welzel (2013): People with stronger emancipative values contribute more to the public good. Model 2 in Table 1 depicts the results for the social capital variables. In line with the results by Thöni et al. (2012), we find that trust is positively related to contributions. Our estimates suggest that people who indicate that “most people can be trusted” contribute roughly seven units more than participants who state that “one cannot be too careful in dealing with other people” ($t = 2.20$, $p = .029$). However, people indicating stronger civic norms do not seem to contribute more than people indicating weak civic norms. Comparing the overall fit of Models 1 and 2, we find that the values explain more variance than the social capital variables. In Model 3, we estimate the link between values and cooperation controlling for the social capital measures. All coefficients become insignificant, which is presumably due to the positive correlation in the predictor variables. In Model 4, we include further control variables. Aside from the obvious controls for gender and age, we add two control variables capturing general political interest and ideological orientation. We do not find significant effects of these control variables, while trust and emancipative values remain insignificant.16

Regarding our subhypotheses, we do not find evidence that participants from West Germany behave more cooperatively than participants from East Germany (Mann–Whitney, $z = 0.179$, 

![Figure 3. Histogram of contributions in the public goods game.](image)
In accordance with our hypothesis, we observe that Protestants contribute significantly more than Catholics (58.2 vs. 47.5, Mann–Whitney, \(z = -2.19, p = .029\)). To conclude, we observe a positive relation between emancipative values and contributions in a simple regression, whereas in multiple regressions the coefficient is at best weakly significant. For secular values, we do not find a significant link with cooperation.

### Production and Protection in the Property Rights Game

In total, 188 participants completed the property rights game. Figure 4 shows the histograms of the allocation of the seven resource units. On average, participants allocate 4.37 units (62%) to production; 1.94 units (28%) to protection, and 0.7 units (10%) to stealing.\(^{17}\)

In the following analysis, we focus on production and protection. As participants have to distribute all seven units to the three activities, stealing is merely the residual. Table 2 shows regressions with robust standard errors to analyze the relationship between production and our covariates from the WVS. We find a strong relationship between secular values and the production decision, whereas emancipative values do not associate with this decision (Model 1). Participants who score one standard deviation higher on secular values allocate 0.33 units

\[ p = .858 \]. In accordance with our hypothesis, we observe that Protestants contribute significantly more than Catholics (58.2 vs. 47.5, Mann–Whitney, \(z = -2.19, p = .029\)). To conclude, we observe a positive relation between emancipative values and contributions in a simple regression, whereas in multiple regressions the coefficient is at best weakly significant. For secular values, we do not find a significant link with cooperation.

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

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Contribution</td>
<td>Contribution</td>
<td>Contribution</td>
<td>Contribution</td>
</tr>
<tr>
<td>Emancipative values</td>
<td>3.498(^{†})</td>
<td>2.770</td>
<td>3.007</td>
<td></td>
</tr>
<tr>
<td></td>
<td>([-0.238, 7.234])</td>
<td>([-1.017, 6.557])</td>
<td>([-0.937, 6.951])</td>
<td></td>
</tr>
<tr>
<td>Secular values</td>
<td>2.701</td>
<td>3.691</td>
<td>3.268</td>
<td></td>
</tr>
<tr>
<td></td>
<td>([-0.970, 6.371])</td>
<td>([-0.756, 8.138])</td>
<td>([-1.328, 7.863])</td>
<td></td>
</tr>
<tr>
<td>Trust</td>
<td>7.039(^{*})</td>
<td>4.954</td>
<td>4.516</td>
<td></td>
</tr>
<tr>
<td></td>
<td>([0.725, 13.353])</td>
<td>([-1.442, 11.350])</td>
<td>([-2.252, 11.284])</td>
<td></td>
</tr>
<tr>
<td>Civic norms</td>
<td>-0.525</td>
<td>1.820</td>
<td>1.364</td>
<td></td>
</tr>
<tr>
<td></td>
<td>([-4.179, 3.129])</td>
<td>([-2.456, 6.096])</td>
<td>([-3.162, 5.890])</td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>-3.126</td>
<td>-3.126</td>
<td>-0.166, 3.914</td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>0.051</td>
<td>-0.162, 0.265</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Political interest</td>
<td>-0.254</td>
<td>-4.004, 3.496</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Left-right</td>
<td>-1.383</td>
<td>-5.708, 2.942</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>52.061(<em>)</em></td>
<td>51.274(<em>)</em></td>
<td>50.016(<em>)</em></td>
<td>49.807(<em>)</em></td>
</tr>
<tr>
<td></td>
<td>([48.641, 55.480])</td>
<td>([47.063, 55.485])</td>
<td>([45.717, 54.316])</td>
<td>([37.985, 61.630])</td>
</tr>
<tr>
<td>(F) test</td>
<td>3.7</td>
<td>2.4</td>
<td>2.8</td>
<td>1.8</td>
</tr>
<tr>
<td>Prob &gt; (F)</td>
<td>0.025</td>
<td>0.092</td>
<td>0.025</td>
<td>0.086</td>
</tr>
<tr>
<td>(R^2) adjusted</td>
<td>.021</td>
<td>.012</td>
<td>.029</td>
<td>.019</td>
</tr>
<tr>
<td>(N)</td>
<td>246</td>
<td>245</td>
<td>245</td>
<td>245</td>
</tr>
</tbody>
</table>

Note. OLS estimates. Dependent variable is contribution in the public goods game \([0, 20, 40, 60, 80, 100]\). 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 regard to left and right on a scale from 0 to 10, with lower numbers indicating left and higher numbers right. Robust standard errors are in parentheses. OLS = ordinary least squares. \(\dagger p < .1. \ast p < .05. \ast\ast p < .01.\)
Figure 4. Allocation of the resources in the property rights game.
more to production ($t = 2.47, p = .014$). Similar to public good contributions, production decisions are positively linked with trust, but not with civic norms (Model 2). A person who trusts allocates roughly 0.6 units more to production ($t = 2.42, p = .016$). In Model 3, we include both sets of explanatory variables and find that the link between trust and the production decision weakens, whereas for secular values the link retains its strength. Hence, secular values account for additional variance above and beyond social capital. Effect sizes and significance levels are robust to the inclusion of political and demographic controls (Model 4), and the controls itself are insignificant.18 Concerning our two subhypotheses, we find that West and East Germans do not differ significantly with respect to production (Mann–Whitney, $z = −1.34, p = .179$). However, we observe significant differences across religious groups. Protestants allocate on average 4.5 units to production, versus 3.8 units for Catholics (Mann–Whitney, $z = −1.99, p = .046$).

To sum up, secular values show robust predictive power for the production decision, whereas emancipative values seem unrelated. People who trust and attribute less value to sacred authority are more likely to realize efficient outcomes. We take these results as an indication that secularization is compatible with desirable social outcomes.

Table 2. OLS Estimates for Production.

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Production</td>
<td>Production</td>
<td>Production</td>
<td>Production</td>
</tr>
<tr>
<td>Emancipative values</td>
<td>0.163</td>
<td>0.090</td>
<td>0.087</td>
<td></td>
</tr>
<tr>
<td></td>
<td>[−0.148, 0.474]</td>
<td>[−0.239, 0.419]</td>
<td>[−0.256, 0.430]</td>
<td></td>
</tr>
<tr>
<td>Secular values</td>
<td>0.329*</td>
<td>0.356*</td>
<td>0.355*</td>
<td></td>
</tr>
<tr>
<td></td>
<td>[0.066, 0.591]</td>
<td>[0.058, 0.655]</td>
<td>[0.043, 0.668]</td>
<td></td>
</tr>
<tr>
<td>Trust</td>
<td>0.591*</td>
<td>0.474†</td>
<td></td>
<td>0.436†</td>
</tr>
<tr>
<td></td>
<td>[0.109, 1.072]</td>
<td>[−0.033, 0.981]</td>
<td></td>
<td>[−0.070, 0.943]</td>
</tr>
<tr>
<td>Civic norms</td>
<td>−0.140</td>
<td>0.050</td>
<td>−0.249, 0.350</td>
<td>0.024</td>
</tr>
<tr>
<td></td>
<td>[−0.401, 0.120]</td>
<td></td>
<td></td>
<td>[−0.295, 0.342]</td>
</tr>
<tr>
<td>Female</td>
<td></td>
<td>−0.041</td>
<td></td>
<td>[−0.579, 0.498]</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>[−0.009, 0.023]</td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
<td></td>
<td>0.007</td>
</tr>
<tr>
<td>Political</td>
<td></td>
<td></td>
<td></td>
<td>[−0.251, 0.306]</td>
</tr>
<tr>
<td>interest</td>
<td></td>
<td></td>
<td></td>
<td>0.039</td>
</tr>
<tr>
<td>Left-right</td>
<td></td>
<td></td>
<td></td>
<td>[−0.230, 0.308]</td>
</tr>
<tr>
<td>Constant</td>
<td>4.187**</td>
<td>4.069**</td>
<td>4.001**</td>
<td>3.743**</td>
</tr>
<tr>
<td></td>
<td>[3.907, 4.468]</td>
<td>[3.759, 4.378]</td>
<td>[3.685, 4.318]</td>
<td>[2.901, 4.584]</td>
</tr>
<tr>
<td>$F$ test</td>
<td>4.5</td>
<td>3.5</td>
<td>3.6</td>
<td>2.1</td>
</tr>
<tr>
<td>Prob &gt; $F$</td>
<td>0.012</td>
<td>0.033</td>
<td>0.007</td>
<td>0.039</td>
</tr>
<tr>
<td>$R^2$ adjusted</td>
<td>.037</td>
<td>.026</td>
<td>.050</td>
<td>.033</td>
</tr>
<tr>
<td>$N$</td>
<td>183</td>
<td>182</td>
<td>182</td>
<td>182</td>
</tr>
</tbody>
</table>

Note. OLS estimates. Dependent variable is units allocated to production in the property rights game [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 regard to left and right on a scale from 0 to 10, with lower numbers indicating left and higher numbers right. Robust standard errors are in parentheses. OLS = ordinary least squares. $^*p < .1. ^{†}p < .05. ^{**}p < .01.$
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 rational response. As shown in Figure 4, we observe that 80% of participants allocate at least one unit to protection. The multiple regression analyses in Table 3 show the inverse pattern to that of the production behavior. In Model 1, we look at the link between 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 (\(t = -2.93, p = .004\)). In Model 2, trust is weakly significantly linked to protection (\(t = -1.66, p = .099\)). In Model 3, we include both sets of variables and the social capital measures become insignificant, whereas secular values retain strength and significance. The same holds if we include the additional controls (Model 4).19

While we find that Catholics and Protestants behave differently with respect to production, we do not observe such differences in the protection decision (Mann–Whitney, \(z = 1.22, p = .224\)). Furthermore, we do not find evidence for differences in the behavior between West and East German participants (Mann–Whitney, \(z = -0.623, p = .533\)). To conclude, we observe that behavior in the property rights game is tightly associated with secular values. Participants who score

<table>
<thead>
<tr>
<th>Model</th>
<th>Protection</th>
<th>Protection</th>
<th>Protection</th>
<th>Protection</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1)</td>
<td>-0.013</td>
<td>0.026</td>
<td>0.016</td>
<td></td>
</tr>
<tr>
<td>(2)</td>
<td>-0.348**</td>
<td>-0.355**</td>
<td>-0.348*</td>
<td></td>
</tr>
<tr>
<td>(3)</td>
<td>-0.325†</td>
<td>-0.263</td>
<td>-0.260</td>
<td></td>
</tr>
<tr>
<td>(4)</td>
<td>-0.325†</td>
<td>-0.263</td>
<td>-0.260</td>
<td></td>
</tr>
</tbody>
</table>

Note. OLS estimates. Dependent variable is units allocated to 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 regard to left and right on a scale from 0 to 10, with lower numbers indicating left and higher numbers right. Robust standard errors are in parentheses. OLS = ordinary least squares.

\(†p < .1. \ast p < .05. \ast\ast p < .01.\)
high on those values allocate on average more resources to production and fewer to protection. This confirms our hypothesis about the negative link between secular values and protectionist behavior.

Consequently, the higher the score on secular values, the closer is a participant’s behavior to the socially optimal behavior. Interestingly, while we observe that secular values relate positively to production and negatively to protection, they are not significantly linked to stealing. Behavior in this game might be strongly driven by the beliefs participants hold about their partner. People who emphasize secular values find little appeal in sacrosanct authority, which is usually idolized as a force of order in a presumably chaotic and dangerous world. Hence, adherents of secular values might generally be more relaxed and less fearful, and expect less stealing from others. On the contrary, strong secular values do not seem to be related to a participant’s own “immoral” behavior.

### Donations

We observe behavior in the donation decision for 179 participants. On average, participants are willing to donate 14.4% of their potential income to a charity ($SD = 20.9$). A bit more than half of the participants (54%) are willing to donate. Among the participants who donate, the mean

<table>
<thead>
<tr>
<th>Table 4. OLS Estimates for Donation.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td>(1)</td>
</tr>
<tr>
<td>Donation</td>
</tr>
<tr>
<td>Emancipative values</td>
</tr>
<tr>
<td>5.723**</td>
</tr>
<tr>
<td>[2.013, 9.432]</td>
</tr>
<tr>
<td>Secular values</td>
</tr>
<tr>
<td>-2.135</td>
</tr>
<tr>
<td>[-5.632, 1.362]</td>
</tr>
<tr>
<td>Trust</td>
</tr>
<tr>
<td>7.159*</td>
</tr>
<tr>
<td>[1.046, 13.271]</td>
</tr>
<tr>
<td>Civic norms</td>
</tr>
<tr>
<td>5.246**</td>
</tr>
<tr>
<td>[3.173, 7.319]</td>
</tr>
<tr>
<td>Female</td>
</tr>
<tr>
<td>-3.195</td>
</tr>
<tr>
<td>[−9.844, 3.453]</td>
</tr>
<tr>
<td>Age</td>
</tr>
<tr>
<td>0.315**</td>
</tr>
<tr>
<td>[0.087, 0.544]</td>
</tr>
<tr>
<td>Political interest</td>
</tr>
<tr>
<td>2.657†</td>
</tr>
<tr>
<td>[-0.146, 5.460]</td>
</tr>
<tr>
<td>Left-right</td>
</tr>
<tr>
<td>-2.952</td>
</tr>
<tr>
<td>[-6.580, 0.677]</td>
</tr>
<tr>
<td>Constant</td>
</tr>
<tr>
<td>12.089**</td>
</tr>
<tr>
<td>[9.384, 14.794]</td>
</tr>
<tr>
<td>$F$ test</td>
</tr>
<tr>
<td>4.7</td>
</tr>
<tr>
<td>Prob &gt; $F$</td>
</tr>
<tr>
<td>0.011</td>
</tr>
<tr>
<td>$R^2$ adjusted</td>
</tr>
<tr>
<td>.038</td>
</tr>
<tr>
<td>$N$</td>
</tr>
<tr>
<td>174</td>
</tr>
</tbody>
</table>

Note. OLS estimates. Dependent variable is the amount donated to a charity of choice in percentage of the earnings [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 regard to left and right on a scale from 0 to 10, with lower numbers indicating left and higher numbers right. Robust standard errors are in parentheses. OLS = ordinary least squares.

† $p < .1$. * $p < .05$. ** $p < .01$. 
donation is 26.6% ($SD = 21.9$). In a design very similar to ours (with a student sample), Schulz, Thiemann, and Thöni (2015) find about 44% willing to donate and 16.3% of the earnings donated on average.

Table 4 depicts the results of the OLS regressions for the link between values and donations. In Model 1, we regress the amount donated (as percentage) on emancipative and secular values. We find that emancipative values are strongly related to the donation decision. An increase in emancipative values by one standard deviation is associated with an increase in donations by 5.7 percentage points ($t = 3.05, p = .003$). In Model 2, we regress the amount donated on the social capital measures. Both predictors account for some variance of the dependent variable. Participants who trust donate on average 7.1 percentage points more ($t = 2.31, p = .022$). An increase of one standard deviation in civic norms leads to an increase in the amount donated of about 5 percentage points ($t = 2.73, p = .007$). Furthermore, stronger interest in politics seems to be positively related to donations ($t = 1.87, p = .063$).

We do not observe a significant difference in the donation behavior between East and West German participants (Mann–Whitney, $z = −0.98, p = .327$). Nor do we find a significant difference between Protestants and Catholics (Mann–Whitney, $z = −0.96, p = .337$).

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 values only for the sample of people who donate, we observe an increase of the effect size to roughly 7 percentage points ($t = 3.07, p = .003$).

Summing up, both emancipative values and adherence to civic norms associate positively with the amount donated. If one follows Welzel (2010) and defines “civicness” as people’s willingness to cooperate with strangers and to share with unfamiliar others, then our results provide evidence for the civic implications of certain sets of moral values. Specifically, we see from the donation decisions that people with strong emancipative values share more with strangers compared with what people with weak emancipative values do.

### Controlling for Sample Selection Bias

At the beginning of “Design and Procedures” section, we mentioned that women and young people are overrepresented in our experimental sample compared with the WVS sample. To control for selection bias, we follow Heckman (1979). The first step of the Heckman correction is to estimate a probit model for the individual probability to belong to the selected sample (selection equation). Second, we use the estimated coefficient of the selection equation to predict the inverse Mill’s ratio. The final step is to estimate the original regression using the inverse Mill’s ratio as a regressor.

It is crucial to this method to identify 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 variables. The variable measures an interviewer’s success in motivating the respondents of the WVS in participating in the behavioral experiment.
The roughly 2,000 WVS interviews were conducted by 134 interviewers. For each interviewer, we calculate an individual success rate as the total number of email addresses collected for the behavioral experiment, divided by the total number of interviews conducted. Interviewers differed a lot in their success rate (mean = 0.24, \(SD = 0.22\), minimum = 0, maximum = 1). This variable is highly related to selection into the sample of the behavioral experiment, but unlikely to be related to the dependent variables of interest. Participants who indicated their email address are more likely to participate in our behavioral experiment because we were able to send them a direct link to access our website. However, the success rate of the interviewer is not likely to be related, for example, to contributions in the public goods game.\(^{21}\) We reestimated all our models from Tables 1 to 4 using the Heckman procedure. All our main links remain unchanged, which suggests that the results are not driven by selection bias.\(^{22}\)

**Discussion**

We study the individual-level linkage between secular and emancipative values, on one hand, and prosocial behavior, on the other hand, as observed in a nationally representative sample. As concerns secular and emancipative values, we have shown four relations, most of which proved robust against controls for sampling bias, demographic characteristics, public interest, ideological orientations, as well as personality traits and social capital. To begin with, *emancipative* values seem to relate to (a) larger contributions to the public good and (b) relate strongly to more generous donations to charities. Both relations involve decisions about sharing some part of one’s endowment with strangers. But while mutual cooperation produces a personal gain, donating is clearly a sacrifice. The donation decision is, hence, more indicative of altruism, and this is where the link with the emancipative values is strongest. Apparently, the behavioral impulse of these values is more powerful when it comes to decisions about true material sacrifice than in situations that still involve opportunities for material gain. Hence, we confirm Welzel’s (2010) hypothesis that emancipative values correspond with universal altruism—at least for the German context.
Secular values, for their part, show no behavioral impulse in situations in which social sharing is the issue. They show such an impact, however, in the property rights game, in which the success of a strategy depends on what strategy the others have chosen. Specifically, stronger secular values correspond with (c) more productive investments and at the same time (d) less protective investments. Although these decisions do not involve a joint project, they nevertheless depend on beliefs about the other player’s strategy. From this point of view, secular values involve lower fears that strangers behave in an asocial manner, for which reason these values contribute to investment decisions conducive to the social optimum. Despite their significance, the behavioral impulses of secular values proved to be considerably weaker than those of emancipative values, especially in the case of altruism. Our results also support the notion that the positive relation between religiosity and prosociality found in self-reported data does not carry over to behavioral data (Shariff, 2015).

Moreover, our analysis shows that one standard measure of social capital associates with observed behavior while another one does not, or only very weakly so. Specifically, interpersonal trust is linked with larger contributions in the public goods game and bigger investments into production in the property rights game. By contrast, adherence to civic norms is only associated with the donation decision. The lack of relevance of adherence to civic norms confirms Welzel’s (2010) criticism that this measure often does not keep to the promise of its expected prosocial effects, presumably because it rather captures social desirability than truly internalized civic orientations.

Historically rooted cleavages that characterize the cultural map of Europe, namely, the East–West cleavage and the Protestant–Catholic cleavage did not prove overly important in the German context. The only effect we found with respect to these historic cleavages is that Protestants contribute more to the public good and allocate more units to production in the property rights game than Catholics.

To the best of our knowledge, this is the first study to establish a direct individual-level link between secular/emancipative values and behavior, with respect to observed—not self-reported—behavior. This was possible through a methodological innovation, combining a national representative survey in Germany with a behavioral experiment on three facets of prosocial behavior. The fact that we reached empirically significant and theoretically meaningful results shows that this innovation works and can be extended to other societies with a sufficient degree of computer literacy.

As Germany represents Europe’s biggest nation and the fourth-largest economy in the world, the results are relevant in and by themselves. But Germany is also in many respects a typical postindustrial knowledge society, for which reason comparable results might well be obtainable in other such societies, from the United States to Australia to Japan, and even beyond.

Preliminary evidence that our approach and findings, especially concerning the link between values and cooperation, might be valid in a wider cross-cultural context than just Germany is provided in Figure 5. It plots data from laboratory experiments conducted with student subject pools in 14 countries around the globe (Herrmann et al., 2008), in relation to the average emancipative values in the respective national population, as measured by the WVS. Although this plot only covers 14 different country locations, the relationship is highly significant (standardized linear regression: $\beta = .71, t = 3.65, p = .003$) and explains a substantial part of the variance in cooperation ($R^2 = .51$). Much like in the behavioral experiment we propose in this article, cooperation shown in Figure 5 was measured in a controlled and incentivized environment, following a standardized procedure in all countries. Differences in the observed individual-level behavior can be explained by country-level differences in the cultural environment of the participants. Presumably, the differences in emancipative values as measured by the WVS capture important determinants for cooperative outcomes in social dilemma situations. Against this backdrop, our German pilot study is truly essential as it tells us that this macro-level link does not
seem to be a mere artifact of aggregation but has a valid micro-foundation at the individual level—at least at one of the places covered.  

This suggestive evidence calls even more loudly for a replication of our study at other places. To conclude, we are convinced that the combination of behavioral experiments with representative surveys provides a novel and powerful tool to establish mind-set–behavior links in a more valid way than is possible by either one method alone. We see our study as a promising first step to extend this research design to more countries covered in Round 7 of the WVS. This would allow to examine whether and how the individual-level linkages between moral values and cooperative behavior vary by cultural background and country-level characteristics.

Appendix

Items and Response Format of the Emancipative Values

1. Autonomy Subindex:
   - Here is a list of qualities that children can be encouraged to learn at home. Which, if any, do you consider to be especially important?
     - Independence (mentioned/not mentioned)
     - Imagination (mentioned/not mentioned)
     - Obedience (mentioned/not mentioned)

2. Equality Subindex:
   - Do you agree, disagree or neither agree nor disagree with the following statements?
     - When jobs are scarce, men should have more right to a job than women. (agree/disagree/neither agree nor disagree)
     - For each of the following statements I read out, can you tell me how strongly you agree or disagree with each. Do you strongly agree, agree, disagree, or strongly disagree?
       - A university education is more important for a boy than for a girl. (strongly agree/agree/disagree/strongly disagree)
       - On the whole, men make better political leaders than women do. (strongly agree/agree/disagree/strongly disagree)

3. Choice Subindex:
   - Please tell me for each of the following actions whether you think it can always be justified, never be justified, or something in between using this card (10-point scale):
     - Homosexuality (1 [never justifiable] to 10 [always justifiable])
     - Abortion (1 [never justifiable] to 10 [always justifiable])
     - Divorce (1 [never justifiable] to 10 [always justifiable])

4. Voice Subindex:
   - People sometimes talk about what the aims of this country should be for the next ten years. On this card are listed some of the goals which different people would give top priority. Would you please say which one of these you, yourself, consider the most important? ( . . . ) And second most important?
     - Giving people more say in important government decisions (most important/second most important/not mentioned)
     - Protecting freedom of speech (most important/second most important/not mentioned)
○ Seeing that people have more say about how things are done at their jobs and in their communities. *(most important/second most important/not mentioned)*

**Items and Response Format of the Secular Values**

1. **Defiance Subindex:**
   - People pursue different goals in life. For each of the following goals, can you tell me if you strongly agree, agree, disagree or strongly disagree with it?
   - One of my main goals in life has been to make my parents proud. *(strongly agree/agree/disagree/strongly disagree)*
   - I’m going to read out a list of various changes in our way of life that might take place in the near future. Please tell me for each one, if it were to happen, whether you think it would be a good thing, a bad thing, or don’t you mind?
     - Greater respect for authority *(good/don’t mind/bad)*
   - How proud are you to be [German]? *(very proud/quite proud/not very proud/not at all proud/I am not [German])*

2. **Agnosticism Subindex:**
   - For each of the following, indicate how important it is in your life.
     - Religion *(very important/rather important/not very important/not at all important)*
   - Apart from weddings and funerals, about how often do you attend religious services these days? *(more than once a week/once a week/once a month/only on special holy days/once a year/less often/never, practically never)*
   - Independently of whether you attend religious services or not, would you say you are *(a religious person/not a religious person/an atheist)*

3. **Relativism Subindex:**
   - Please tell me for each of the following actions whether you think it can always be justified, never be justified, or something in between, using this card.
     - Avoiding a fare on public transport *(1 [never justifiable] to 10 [always justifiable])*
     - Cheating on taxes if you have a chance *(1 [never justifiable] to 10 [always justifiable])*
     - Someone accepting a bribe in the course of their duties *(1 [never justifiable] to 10 [always justifiable])*

4. **Skepticism Subindex:**
   - I am going to name a number of organizations. For each one, could you tell me how much confidence you have in them: is it a great deal of confidence, quite a lot of confidence, not very much confidence or none at all?
     - The armed forces *(a great deal/quite a lot/not very much/none at all)*
     - The police *(a great deal/quite a lot/not very much/none at all)*
     - The courts *(a great deal/quite a lot/not very much/none at all)*
Table A1. Summary Table Zero-Order Correlations.

<table>
<thead>
<tr>
<th>Measure</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Contribution</td>
<td>—</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>55.08</td>
<td>25.40</td>
</tr>
<tr>
<td>2. Production</td>
<td>.3243**</td>
<td>—</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>4.37</td>
<td>1.66</td>
</tr>
<tr>
<td>n = 188</td>
<td></td>
<td>.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Protection</td>
<td>.3219**</td>
<td>−.7304***</td>
<td>—</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1.94</td>
<td>1.33</td>
</tr>
<tr>
<td>n = 188</td>
<td>.000</td>
<td></td>
<td>.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Donation</td>
<td>.1775*</td>
<td>−.026</td>
<td>.0243</td>
<td>—</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>14.41</td>
<td>20.88</td>
</tr>
<tr>
<td>n = 179</td>
<td>.0175</td>
<td>.7297</td>
<td>.7466</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Emancipative</td>
<td>.1427*</td>
<td>.127*</td>
<td>−.0677</td>
<td>.2026**</td>
<td>—</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.55</td>
<td>0.16</td>
</tr>
<tr>
<td>values</td>
<td>.0252</td>
<td>.0866</td>
<td>.3623</td>
<td>.0073</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>n = 246</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Secular</td>
<td>.1281*</td>
<td>.2025**</td>
<td>−.2429**</td>
<td>−.0336</td>
<td>.2732**</td>
<td>—</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.39</td>
<td>0.15</td>
</tr>
<tr>
<td>values</td>
<td>.0448</td>
<td>.006</td>
<td>.0009</td>
<td>.66</td>
<td>.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>n = 246</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Trust</td>
<td>.1099†</td>
<td>.1571*</td>
<td>−.1063</td>
<td>.1799**</td>
<td>.0765**</td>
<td>−.0297</td>
<td>—</td>
<td></td>
<td></td>
<td></td>
<td>0.42</td>
<td>0.49</td>
</tr>
<tr>
<td>n = 252</td>
<td>.0817</td>
<td>.0313</td>
<td>.1464</td>
<td>.016</td>
<td>.0005</td>
<td>.179</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Civic norms</td>
<td>−.0198</td>
<td>−.0739</td>
<td>.1162</td>
<td>.2277**</td>
<td>−.0073</td>
<td>−.5267**</td>
<td>.0408†</td>
<td>—</td>
<td></td>
<td></td>
<td>9.24</td>
<td>1.18</td>
</tr>
<tr>
<td>n = 245</td>
<td>.7583</td>
<td>.3215</td>
<td>.1181</td>
<td>.0026</td>
<td>.7427</td>
<td>.000</td>
<td>.0674</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. Political</td>
<td>.0654</td>
<td>.0649</td>
<td>.0167</td>
<td>.2254**</td>
<td>.1243**</td>
<td>−.0737**</td>
<td>.0924**</td>
<td>.0503*</td>
<td>—</td>
<td></td>
<td>0.59</td>
<td>0.34</td>
</tr>
<tr>
<td>interest</td>
<td>.3072</td>
<td>.3828</td>
<td>.8228</td>
<td>.0028</td>
<td>.000</td>
<td>.009</td>
<td>.024</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>n = 246</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10. Political</td>
<td>−.0598</td>
<td>.0126</td>
<td>−.0053</td>
<td>−.123</td>
<td>−.0398†</td>
<td>−.0998**</td>
<td>.0122</td>
<td>.0322</td>
<td>.0953**</td>
<td>—</td>
<td>4.32</td>
<td>2.52</td>
</tr>
<tr>
<td>orientation</td>
<td>.3503</td>
<td>.8656</td>
<td>.9436</td>
<td>.1059</td>
<td>.0717</td>
<td>.000</td>
<td>.5814</td>
<td>.1488</td>
<td>.000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>n = 183</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note. The first row per entry denotes the estimates of the Pearson product–moment correlation coefficient. The second row denotes the significance level. In the third row, we report the number of observations. The mean and the standard deviation are based on the sample of the behavioral experiment for the measures 1 to 4. For the measures 5 to 10, the mean and the standard deviation are based on the complete sample of the World Values Survey.

†p < .1, *p < .05, **p < .01.
Table A2. OLS Estimates for Contribution in the Public Goods Game Including Additional Control Variables.

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Contribution</td>
<td>Contribution</td>
<td>Contribution</td>
</tr>
<tr>
<td>Emancipative values</td>
<td>2.253</td>
<td>3.310†</td>
<td>3.424†</td>
</tr>
<tr>
<td></td>
<td>[−1.960, 6.466]</td>
<td>[−0.519, 7.139]</td>
<td>[−0.471, 7.319]</td>
</tr>
<tr>
<td>Secular values</td>
<td>2.785</td>
<td>2.711</td>
<td>2.579</td>
</tr>
<tr>
<td></td>
<td>[−1.153, 6.723]</td>
<td>[−0.943, 6.366]</td>
<td>[−1.179, 6.337]</td>
</tr>
<tr>
<td>Outgroup trust</td>
<td>1.784</td>
<td>1.784</td>
<td>1.824</td>
</tr>
<tr>
<td></td>
<td>[−3.262, 6.829]</td>
<td>[−3.262, 6.829]</td>
<td>[−3.262, 6.829]</td>
</tr>
<tr>
<td>Ingroup trust</td>
<td>1.672</td>
<td>1.672</td>
<td>1.712</td>
</tr>
<tr>
<td></td>
<td>[−2.860, 6.203]</td>
<td>[−2.860, 6.203]</td>
<td>[−2.860, 6.203]</td>
</tr>
<tr>
<td>Perceived security</td>
<td>1.784</td>
<td>1.784</td>
<td>1.784</td>
</tr>
<tr>
<td></td>
<td>[−3.262, 6.829]</td>
<td>[−3.262, 6.829]</td>
<td>[−3.262, 6.829]</td>
</tr>
<tr>
<td>Extraversion</td>
<td>−0.078</td>
<td>−0.078</td>
<td>−0.078</td>
</tr>
<tr>
<td>Neuroticism</td>
<td>0.506</td>
<td>0.506</td>
<td>0.506</td>
</tr>
<tr>
<td></td>
<td>[−2.622, 3.634]</td>
<td>[−2.622, 3.634]</td>
<td>[−2.622, 3.634]</td>
</tr>
<tr>
<td>Openness to experience</td>
<td>0.711</td>
<td>0.711</td>
<td>0.711</td>
</tr>
<tr>
<td></td>
<td>[−3.002, 4.424]</td>
<td>[−3.002, 4.424]</td>
<td>[−3.002, 4.424]</td>
</tr>
<tr>
<td>Conscientiousness</td>
<td>−0.260</td>
<td>−0.260</td>
<td>−0.260</td>
</tr>
<tr>
<td></td>
<td>[−3.523, 3.004]</td>
<td>[−3.523, 3.004]</td>
<td>[−3.523, 3.004]</td>
</tr>
<tr>
<td>Agreeableness</td>
<td>−0.836</td>
<td>−0.836</td>
<td>−0.836</td>
</tr>
<tr>
<td></td>
<td>[−4.545, 2.872]</td>
<td>[−4.545, 2.872]</td>
<td>[−4.545, 2.872]</td>
</tr>
<tr>
<td>Constant</td>
<td>52.712**</td>
<td>51.935**</td>
<td>51.900**</td>
</tr>
<tr>
<td></td>
<td>[49.109, 56.315]</td>
<td>[48.545, 55.324]</td>
<td>[48.387, 55.413]</td>
</tr>
<tr>
<td>F test</td>
<td>1.9</td>
<td>3.1</td>
<td>1.3</td>
</tr>
<tr>
<td>Prob &gt; F</td>
<td>0.106</td>
<td>0.026</td>
<td>0.251</td>
</tr>
<tr>
<td>$R^2$</td>
<td>0.036</td>
<td>0.033</td>
<td>0.032</td>
</tr>
<tr>
<td>N</td>
<td>235</td>
<td>246</td>
<td>245</td>
</tr>
</tbody>
</table>

Note. OLS estimates. Dependent variable is contribution in the public goods game [0, 20, 40, 60, 80, 100]. Independent variables are standardized except for perceived security, age, and female. Female and trust are dummy variables. Robust standard errors are in parentheses. OLS = ordinary least squares. †$p < .1$. *$p < .05$. **$p < .01$. 

Table A3. OLS Estimates for Production in the Property Rights Game Including Additional Control Variables.

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Production</td>
<td>Production</td>
<td>Production</td>
<td>Production</td>
</tr>
<tr>
<td>Emancipative values</td>
<td>0.083</td>
<td>0.168</td>
<td>0.094</td>
<td>0.167</td>
</tr>
<tr>
<td></td>
<td>[−0.276, 0.441]</td>
<td>[−0.149, 0.484]</td>
<td>[−0.211, 0.398]</td>
<td>[−0.148, 0.481]</td>
</tr>
<tr>
<td>Secular values</td>
<td>0.364**</td>
<td>0.329*</td>
<td>0.353*</td>
<td>0.280*</td>
</tr>
<tr>
<td></td>
<td>[0.092, 0.635]</td>
<td>[0.066, 0.592]</td>
<td>[0.085, 0.620]</td>
<td>[0.013, 0.547]</td>
</tr>
<tr>
<td>Outgroup trust</td>
<td>0.12</td>
<td>0.12</td>
<td>0.12</td>
<td>0.12</td>
</tr>
<tr>
<td></td>
<td>[−0.357, 0.381]</td>
<td>[−0.357, 0.381]</td>
<td>[−0.357, 0.381]</td>
<td>[−0.357, 0.381]</td>
</tr>
<tr>
<td>Ingroup trust</td>
<td>0.313*</td>
<td>0.313*</td>
<td>0.313*</td>
<td>0.313*</td>
</tr>
<tr>
<td></td>
<td>[0.001, 0.625]</td>
<td>[0.001, 0.625]</td>
<td>[0.001, 0.625]</td>
<td>[0.001, 0.625]</td>
</tr>
</tbody>
</table>

(continued)
Table A3. (continued)

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Perceived security</strong></td>
<td>−0.031</td>
<td>−0.196</td>
<td>−0.144</td>
<td>0.273*</td>
</tr>
<tr>
<td></td>
<td>[−0.265, 0.203]</td>
<td>[−0.471, 0.079]</td>
<td>[−0.375, 0.088]</td>
<td>[0.032, 0.514]</td>
</tr>
<tr>
<td><strong>Extraversion</strong></td>
<td></td>
<td>−0.144</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>[−0.371, 0.093]</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Neuroticism</strong></td>
<td></td>
<td></td>
<td>0.082</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>[−0.166, 0.330]</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Openness to experience</strong></td>
<td></td>
<td>0.273*</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>[0.032, 0.514]</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Conscientiousness</strong></td>
<td></td>
<td></td>
<td>−0.001</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>[−0.271, 0.270]</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Agreeableness</strong></td>
<td></td>
<td></td>
<td>−0.364</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>[−0.922, 0.194]</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>T_rich</strong></td>
<td>4.240***</td>
<td>4.188***</td>
<td>4.191***</td>
<td>4.227***</td>
</tr>
<tr>
<td></td>
<td>[3.945, 4.536]</td>
<td>[3.908, 4.468]</td>
<td>[3.921, 4.462]</td>
<td>[3.860, 4.593]</td>
</tr>
<tr>
<td><strong>T_poor</strong></td>
<td>0.344</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>[−0.274, 0.963]</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>F test</strong></td>
<td>4.2</td>
<td>3.1</td>
<td>3.5</td>
<td>3.6</td>
</tr>
<tr>
<td><strong>Prob &gt; F</strong></td>
<td>0.003</td>
<td>0.028</td>
<td>0.002</td>
<td>0.008</td>
</tr>
<tr>
<td><strong>R²</strong></td>
<td>0.76</td>
<td>0.48</td>
<td>0.91</td>
<td>0.69</td>
</tr>
<tr>
<td><strong>N</strong></td>
<td>175</td>
<td>183</td>
<td>182</td>
<td>183</td>
</tr>
</tbody>
</table>

Note. OLS estimates. Dependent variable is units allocated to production [0,7]. Independent variables are standardized except for perceived security, age, female, and trust. Female and trust are dummy variables. T_rich and T_poor are dummy variables for the endowment treatments. T_rich is the treatment in which the respondent is paired with a person who has a lower endowment in the game. T_poor is the treatment in which the respondent is grouped with a person with a higher endowment in the game. Baseline is the treatment where both respondents have the same endowment. Robust standard errors are in parentheses. OLS = ordinary least squares.

*p < .1. **p < .05. ***p < .01.

Table A4. OLS Estimates for Protection in the Property Rights Game Including Additional Control Variables.

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Emancipative values</strong></td>
<td>0.079</td>
<td>−0.013</td>
<td>−0.005</td>
<td>−0.009</td>
</tr>
<tr>
<td></td>
<td>[−0.221, 0.379]</td>
<td>[−0.282, 0.255]</td>
<td>[−0.264, 0.253]</td>
<td>[−0.267, 0.250]</td>
</tr>
<tr>
<td><strong>Secular values</strong></td>
<td>−0.391**</td>
<td>−0.348**</td>
<td>−0.314*</td>
<td>−0.327***</td>
</tr>
<tr>
<td></td>
<td>[−0.642, −0.141]</td>
<td>[−0.582, −0.114]</td>
<td>[−0.553, −0.075]</td>
<td>[−0.561, −0.092]</td>
</tr>
<tr>
<td><strong>Outgroup trust</strong></td>
<td>−0.092</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>[−0.379, 0.194]</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Ingroup trust</strong></td>
<td>−0.115</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>[−0.368, 0.138]</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Perceived security</strong></td>
<td>0.006</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>[−0.196, 0.207]</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(continued)
Table A4. (continued)

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Protection</td>
<td>0.133</td>
<td>-0.095</td>
<td>-0.085</td>
<td>0.053</td>
</tr>
<tr>
<td></td>
<td>[-0.078, 0.344]</td>
<td>[-0.281, 0.091]</td>
<td>[-0.273, 0.103]</td>
<td>[-0.160, 0.265]</td>
</tr>
<tr>
<td>Neuroticism</td>
<td>-0.095</td>
<td>0.133</td>
<td>-0.262</td>
<td>0.133</td>
</tr>
<tr>
<td></td>
<td>[-0.281, 0.091]</td>
<td>[-0.078, 0.344]</td>
<td>[-0.759, 0.236]</td>
<td>[-0.296, 0.563]</td>
</tr>
<tr>
<td>Openness to experience</td>
<td>-0.085</td>
<td>-0.095</td>
<td>-0.262</td>
<td>-0.057</td>
</tr>
<tr>
<td></td>
<td>[-0.273, 0.103]</td>
<td>[-0.281, 0.091]</td>
<td>[-0.759, 0.236]</td>
<td>[-0.248, 0.133]</td>
</tr>
<tr>
<td>Conscientiousness</td>
<td>0.053</td>
<td>0.053</td>
<td>0.053</td>
<td>0.053</td>
</tr>
<tr>
<td></td>
<td>[-0.160, 0.265]</td>
<td>[-0.160, 0.265]</td>
<td>[-0.160, 0.265]</td>
<td>[-0.160, 0.265]</td>
</tr>
<tr>
<td>Agreeableness</td>
<td>0.053</td>
<td>0.053</td>
<td>0.053</td>
<td>0.053</td>
</tr>
<tr>
<td></td>
<td>[-0.160, 0.265]</td>
<td>[-0.160, 0.265]</td>
<td>[-0.160, 0.265]</td>
<td>[-0.160, 0.265]</td>
</tr>
<tr>
<td>T_rich</td>
<td>0.133</td>
<td>0.133</td>
<td>0.133</td>
<td>0.133</td>
</tr>
<tr>
<td></td>
<td>[-0.296, 0.563]</td>
<td>[-0.296, 0.563]</td>
<td>[-0.296, 0.563]</td>
<td>[-0.296, 0.563]</td>
</tr>
<tr>
<td>T_poor</td>
<td>-0.262</td>
<td>-0.262</td>
<td>-0.262</td>
<td>-0.262</td>
</tr>
<tr>
<td></td>
<td>[-0.759, 0.236]</td>
<td>[-0.759, 0.236]</td>
<td>[-0.759, 0.236]</td>
<td>[-0.759, 0.236]</td>
</tr>
<tr>
<td>Constant</td>
<td>1.988***</td>
<td>2.034**</td>
<td>2.042**</td>
<td>2.044**</td>
</tr>
<tr>
<td></td>
<td>[1.750, 2.225]</td>
<td>[1.810, 2.258]</td>
<td>[1.815, 2.268]</td>
<td>[1.748, 2.341]</td>
</tr>
<tr>
<td>F test</td>
<td>3.4</td>
<td>3.6</td>
<td>2.4</td>
<td>3.2</td>
</tr>
<tr>
<td>Prob &gt; F</td>
<td>0.011</td>
<td>0.015</td>
<td>0.022</td>
<td>0.014</td>
</tr>
<tr>
<td>R²</td>
<td>0.077</td>
<td>0.059</td>
<td>0.075</td>
<td>0.070</td>
</tr>
<tr>
<td>N</td>
<td>175</td>
<td>183</td>
<td>182</td>
<td>183</td>
</tr>
</tbody>
</table>

Note. OLS estimates. Dependent variable is units allocated to protection [0,7]. Independent variables are standardized except for perceived security, age, female, and trust. Female and trust are dummy variables. T_rich and T_poor are dummy variables for the endowment treatments. T_rich is the treatment in which the respondent is paired with a person who has a lower endowment in the game. T_poor is the treatment in which the respondent is grouped with a person with a higher endowment in the game. Baseline is the treatment where both respondents have the same endowment. Robust standard errors are in parentheses. OLS = ordinary least squares.

Table A5. OLS Estimates for the Donation Decision Including Additional Control Variables.

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Donation</td>
<td>4.579*</td>
<td>5.416**</td>
<td>5.247**</td>
</tr>
<tr>
<td></td>
<td>[0.394, 8.764]</td>
<td>[1.574, 9.257]</td>
<td>[1.555, 8.939]</td>
</tr>
<tr>
<td>Emancipative values</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Secular values</td>
<td>-1.594</td>
<td>-2.141</td>
<td>-1.513</td>
</tr>
<tr>
<td></td>
<td>[-5.247, 2.059]</td>
<td>[-5.678, 1.396]</td>
<td>[-4.965, 1.938]</td>
</tr>
<tr>
<td>Outgroup trust</td>
<td>1.237</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>[-3.243, 5.718]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ingroup trust</td>
<td>2.066</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>[-1.921, 6.054]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perceived security</td>
<td>1.890</td>
<td>1.890</td>
<td></td>
</tr>
<tr>
<td></td>
<td>[-0.98, 4.839]</td>
<td>[-3.906, 2.688]</td>
<td></td>
</tr>
<tr>
<td>Extraversion</td>
<td></td>
<td></td>
<td>-0.609</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>[-3.906, 2.688]</td>
</tr>
</tbody>
</table>
Table A5. (continued)

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Donation</td>
<td>Neuroticism</td>
<td>Openness to experience</td>
<td>Conscientiousness</td>
</tr>
<tr>
<td>Neuroticism</td>
<td>-2.104</td>
<td>1.242</td>
<td>2.063</td>
</tr>
<tr>
<td>Openness to experience</td>
<td>1.242</td>
<td>2.063</td>
<td>0.556</td>
</tr>
<tr>
<td>Conscientiousness</td>
<td>2.063</td>
<td>0.556</td>
<td></td>
</tr>
<tr>
<td></td>
<td>[-1.238, 5.364]</td>
<td>[-2.777, 3.890]</td>
<td></td>
</tr>
<tr>
<td>Agreeableness</td>
<td>0.556</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>[-2.777, 3.890]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>12.654***</td>
<td>12.061***</td>
<td>12.154***</td>
</tr>
<tr>
<td>F test</td>
<td>2.7</td>
<td>3.9</td>
<td>2.1</td>
</tr>
<tr>
<td>Prob &gt; F</td>
<td>0.032</td>
<td>0.009</td>
<td>0.048</td>
</tr>
<tr>
<td>$R^2$</td>
<td>0.057</td>
<td>0.055</td>
<td>0.076</td>
</tr>
<tr>
<td>$N$</td>
<td>167</td>
<td>174</td>
<td>173</td>
</tr>
</tbody>
</table>

Note. OLS estimates. Dependent variable is percentage donated [0,100]. Independent variables are standardized except for perceived security, age, and female. Female and trust are dummy variables. Robust standard errors are in parentheses. OLS = ordinary least squares. *$p < .1$. **$p < .05$. ***$p < .01$.

Acknowledgments

We thank the editor, two anonymous reviewers, Lorenz Goette as well as the conference participants of the International Meeting on Experimental and Behavioral Social Sciences (IMEBESS) 2015 in Toulouse, and the seminar participants in Lausanne and Nottingham for helpful comments and suggestions.

Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The author(s) disclosed receipt of the following financial support for the research, authorship, and/or publication of this article: We gratefully acknowledge financial support from the Deutsche Forschungsgemeinschaft and the Swiss National Science Foundation.

Notes

1. The legendary mutual support networks and neighborhood help in communist systems might suggest otherwise but these phenomena indicate cooperation among people connected through bonds of familiarity. This is not cooperation among strangers.
2. A strategic game is defined by (a) a set of players, (b) a set of strategies for each player, and (c) the players’ preferences (see, for example, Osborne & Rubinstein, 1994). Although (a) and (b) 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).
3. Most of these studies rely on convenient samples from student populations and it is an ongoing debate to what extent the results of such games generalize to entire national populations (Henrich, Heine, & Norenzayan, 2010).
4. Some of the features of our behavioral experiment come at a cost. The fact that it is Internet-based restricts the potential participant pool to computer-literate individuals with access to an online device. Unlike in the laboratory, we do not have control over the environment in which participants take their decisions. Although this can be an advantage (the lack of direct interaction with the researcher increases cross-subject anonymity and might lower experimenter demand effects or impression management effects), it can also introduce a confound because the researcher does not know whether responses reflect the participant’s individual decision, or whether respondents consulted other sources before responding.

5. We do not report Cronbach’s alpha or any other internal coherence statistics because this would raise the false expectation that our value measures are “reflective scales” that need to be evaluated against the standards of latent variables. We point this out very explicitly, emphasizing that our measures of secular values and emancipative values are “formative indexes.” Accordingly, they are not summarized because they reflect interchangeable manifestations of single unifying dimension. Instead, they are summarized because (a) they represent complementary constituents that build on each other in fitting the overarching definition of secularism and emancipation and (b) because, in their very combination, these measures are empirically consequential. To meet these two criteria, interitem correlations should actually be modest at best (which is what they are) because only then do the items incorporate enough complementary variance to make their combination sufficiently distinct from what each single item contributes. As the literature on these values has stressed from the beginning (Welzel, 2013, pp. 58-73) and more recently in a specifically methodological piece (Welzel & Inglehart, 2016), this “formative” approach to summarize items is appropriate whenever there are good reasons to assume that items are complementary rather than interchangeable and that what truly matters is indeed the combination of these complementarities. As we will see, our results strongly confirm this approach: When rerunning our regressions with the value measures unpacked into their single components, we generally obtain weaker and less significant results. The supposed effects only surface when the items combine into a single measure of emancipative and secular values each.

6. The exact wording of the two political interest and view questions were (a) How interested would you say you are in politics? (b) In political matters, people talk of “the left” and “the right.” How would you place your views on this scale, generally speaking?

7. All interviewers asked participants to indicate their email address. Participants willing to provide us their address received an email with a personalized link to login to the behavioral experiment.

8. Participants also played a public goods game with punishment, a second property rights game, a risk elicitation task, and a task measuring honesty. To keep the article 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 decision tasks supports the results reported in this article. The link between the moral values and the public goods game with punishment is essentially the same as in public goods game (see “Contributions to the Public Good” section). Honesty seems to be weakly positively correlated with emancipative values. We do not find evidence that moral values have predictive power for risk preferences.

9. We introduced an experimental currency (ECU) to have a measurement of profits independent of the local currency. This procedure facilitates the adaptation of the experiment to other populations with different currencies because it is sufficient to change the exchange rate to the local currency, while all other payoff parameters remain unchanged.

10. We calibrated these amounts with the aim to set expected payoffs similar to the financial incentives offered in comparable studies. Participants’ expected payoffs depend on the response rate of the behavioral experiment, which introduces an additional element of uncertainty in the incentives. There is a methodological debate about the importance of financial incentives and the effect of different stake sizes in behavioral games. In their survey, Camerer and Hogarth (1999) stress the importance of financial incentives, but they also conclude that there is little evidence suggesting that the size of the incentives importantly influences the results. In total (for all decision tasks) we paid 13 participants of this behavioral experiment an amount of €263.50 on average.

11. The word “simultaneous” does not mean “at the same time,” but should be understood in a game-theoretic sense, namely, that participants choose their actions not knowing the decision of their counterpart.

12. Answering correctly was not a requirement to proceed with the experiment, as we did not want to lose respondents not willing or unable to answer the control question. We follow the method of Roux and Thöni (2015) and present the participants with randomly chosen contributions in the control question to avoid a systematic influence on decisions.
13. We implemented three endowment treatments, where the initial endowments varied across players. In one treatment, a player was rich (endowment of 40 ECU) compared with the other player in the group (endowment of 10 ECU). In a second treatment, a player was poor compared with the other player, and in the baseline treatment, both players had the same endowment (10 ECU). Participants were randomly allocated to one of the three treatments. Thus, the effect of the treatment should not influence the analysis with regard to emancipative and secular values. The main effects of the treatment variation on the allocation decision are weak. A one-way ANOVA test indicates the treatment differences are weakly significant for production ($F = 2.24, p = .085$), and insignificant for the other two outcomes (protection: $F = 1.41, p = .242$, stealing: $F = 0.65, p = .585$). In the main article, we do not further discuss these treatment variations. In Tables A3 and A4 in the appendix, we show that none of our results change when we control for differences in the endowment.

14. For the emancipative values, the range in the World Values Survey (WVS) sample is [0, 0.875] and the standard deviation is 0.156 compared with a range of [0.13, 0.875] and a standard deviation of 0.132 in the sample of the participants of the behavioral experiment. For the secular values, the range in the WVS sample is [0.0279, 0.943] and the standard deviation is 0.154; in the sample of the behavioral experiment, the range is [0.110, 0.874] and the standard deviation is 0.145.

15. In all our regression models, we use Huber–White robust standard errors. The significance levels of our results do not change if we estimate the models without robust standard errors.

16. Alternatively, we estimated Model 1 including the Big Five personality measures. In the WVS, the Big Five are measured using Muck, Hell, and Gosling (2007). Previous research (Ashton, Jackson, Helmes, & Paunonen, 1998; Lu & Argyle, 1991) finds positive links to cooperation for extraversion and agreeableness and a negative link for neuroticism. Volk, Thöni, and Ruigrok (2011) find that participants who score high on agreeableness are more likely to have stable cooperation preferences. In our data, we do not find any significant relationship between cooperation and personality traits. Similarly, we included measures for ingroup and outgroup trust in the estimation and find no significant links to contribution. Finally, we check whether our results are driven by a sense of existential security. A set of questions (V170-V191) from the WVS elicits people’s feelings of safety. Several of these items load on a first principal component (existential security). We find that our estimates are robust to the inclusion of this variable. See Table A2 in the appendix.

17. Our results are comparable to Ahn et al. (2016). They report that participants use on average 43% of their resources for production, 29% for protection, and 28% for stealing. The design of the game differed on some important dimensions. Most importantly, they implemented a repeated game with 10 periods.

18. Among the additional sets of covariates, we find that ingroup trust and openness to experience are positively related to the production decision, while all other factors are insignificant (see Table A3 in the appendix).

19. The link between the secular values and the protection decision is robust to the inclusion of the additional control variables discussed in the appendix, while none of the controls is significant (see Table A4).

20. Table A5 in the appendix reports the estimates for extended controls. The coefficient for emancipative values is robust in all specifications, while none of the other predictor variables (Big Five, in-outgroup trust, perceived security) reaches significance.

21. We do not observe any statistically significant correlation between our dependent variables and the individual success rate of the interviewer. Hence, it seems that the individual success is a valid exclusion restriction.

22. For the results of the selection models, see the working paper version (Kistler, Thöni, & Welzel, 2015).

23. The relation between contributions and emancipative values is surprisingly robust to the inclusion of control variables such as trust, the human development index, or a measure for democracy.

24. For a discussion on how behavioral experiments allow to investigate the influence of the “macrosocial” environment on individual behavior, see also Gächter and Thöni (2011).

References


