Subliminal Influence on Generosity

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Abstract

We experimentally subliminally prime subjects prior to charity donation decisions by showing words that have connotations of pro-social values for a very brief time (17ms). Our main finding is that, compared to a baseline condition, the pro-social prime increases donations by approximately 10-17 percent among subjects with strong pro-social preferences (universalism values). We find a similar effect when interacting the prime with the Big 5 personality characteristic of agreeableness. We furthermore introduce a novel method for testing for priming, "subliminity". This method reveals that some subjects are capable of recognizing prime words, and the overall results are weaker when we control for this capacity.

Keywords: Charity; subliminal; priming; universalism; values; personality; pro-social

1   Introduction

To render complex economic environments amenable to coherent analysis, traditional economic models typically assume rational economic agents with stable individual preference rankings over outcomes (Becker and Stigler, 1977). Recently, a more complicated picture of the economic man has emerged, according to which he is a far less perfect implementer of more unstable and unclear individual preferences and goals. Importantly, the individuals considered in economic models may also differ in terms of the stability of their preferences and capacities to implement them. In this case, the societal planner can serve a purpose

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by, for instance, softly and non-intrusively influencing individual perceptions regarding the alignment of individual and societal goals. This could, for example, open the door for new soft policies to reduce free-riding. Such policies could influence the most receptive individuals by helping them to act in line with their "true preferences" without depriving those holding different preferences of their individual freedom. Such methods can thus be used by paternalistic authorities who claim insight into what is best for individuals and, in turn, nudge individuals to act accordingly (Sunnstein and Thaler,2008).

In this vein, there is a recent strand of experimental literature studying how subtle cues (or nudges) affect pro-social behavior.[1] One prominent cue is the "watchful eyes" treatment, which has been studied both in the field (e.g., Ekström, 2012) and in the lab (e.g., Rigdon et al., 2009; Haley and Fessler, 2005; Nettle et al., 2013). Another common way to introduce cues is to use value-laden wording in experimental instructions such as "taking" or "keeping" in the dictator game (Dreber et al., 2013) or "Community Game" and "Wall-street Game" in the context of a public goods game (e.g., Lieberman et al., 2004).[2] Although it is hazardous to compare results from such disparate cues and situations, it is noteworthy that the effect of cues on pro-social behavior seems to be highly contextual. Indeed, some studies find strong effects (Haley and Fessler, 2005), while others reveal no effects (Dreber et al., 2013), and some both do and do not find effects (Nettle et al., 2013). Interestingly, Rigdon et al. (2009) find heterogeneous effects with respect to gender: males are more responsive to the cue. The failure to control for heterogeneous responses across the subject population might well be one explanation for the differential results. In addition, although these cues are often subtle, simple experimenter demand effects cannot be excluded: a subject might observe the cue and simply behave in accordance with what she thinks the experimenter is expecting. We believe that the current study adds to this literature by addressing both of these issues. First, we have a detailed measure of personality in dimensions that we deem important for the responsiveness to the cues introduced. Using these, we can study whether and how the response varies across the subject population. Second, by making the cue subliminal (i.e., a subliminal priming procedure), we minimize the problem of the conscious experimenter demand effect.

Charitable giving and fundraising are widely studied topics in economics (Andreoni, 2006; List, 2011).[3]

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[1]Usually, the data used in these studies come from individual decision-making situations, such as the dictator game or giving to charities, where coordinating effects of cues are not present (Fehr and Schmidt, 2006).

[2]A related identity priming method asks questions that remind the participant of her/his gender (e.g., Boschini et al., 2012), profession (Cohn et al., 2013; Cohn et al., 2014) or religion (Ahmed and Salas, 2011).

[3]See List (2008), introducing a special issue on field experiments on charitable giving in this journal, Engel (2011) for a

There is yet much to learn about the causal mechanisms of giving. In a recent review article, Andreoni and Payne (2013) call for further research to determine how the social context – including potential unconscious stimuli – may subtly influence charitable giving. The authors suggest that such studies might constitute part of the "next generation of research on altruism, giving, fundraising, and markets for charity" (Andreoni and Payne, 2013, pp. 4). Such research is also practically relevant. For example, an increasing fraction of donations are made online, which allow recipient organizations to experiment with a number of subtle website design factors in an attempt to influence the amounts donated. The design variables in such experimentation may include both explicit solicitations and informational factors as well as implicit cues and primes. Potential donors browsing the donation websites are clearly a highly selected group of individuals who tend to value the organizations' work more highly than the median citizen. Our results suggest that subtle changes in website design might influence donations: we find a more than 10% increase in donations due to subliminal priming among pro-donation-minded participants in our experiment. This effect is quite substantial in economic terms but should be interpreted with caution because the lab context, with its windfall money and convenience subject pool, differs from a natural field context (Eckel and Grossman, 2008; Carpenter, 2008; Carlsson et al. 2013). Moreover, our results suggest that experimenter demand effects may partially account for the mixed findings in past research.

In this paper, we study the role of subliminal priming[4] - a nudge that is largely unexplored in economics.[5] In particular, in an experimental design with over 300 subjects, we investigate whether subliminally priming broad pro-social goals - universalism values (Schwartz, 1992) - leads to higher subsequent pro-social giving to charity. The priming consists of value-laden prime words that are shown to each participant for a very short duration (17ms) just before the donation tasks. The charity donation decisions bear real consequences, and the subjects are aware of this. We contrast the pro-social priming treatment with a neutral priming treatment, in which the words shown have no value-laden connotation. By using well-established measures of personality, we also investigate the interaction effect between priming and aligned personality dimensions (specifically, the value orientation of universalism and the Big 5 personality trait of agreeableness).

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meta study of dictator games studying a related topic of donations to a random stranger in lab experiments, and Eckel and Grossman (1996) and the literature that follows to understand the connections between the two strands of the literature.

[4]A subliminal stimulus is presented for such a short duration that it does not reach an individual's threshold for conscious perception.

[5]The only subliminal priming study in economics of which we are aware is Posten at al. (2014), who study the influence of priming on beliefs in a trust game setup. We are interested in the effects of subliminal priming on altruistic donations, where priming is expected to predominantly affect the preferences and, in turn, donation behavior, not the beliefs.

Priming refers to the non-conscious activation of social knowledge structures (Bargh, 2006). In a typical priming study, a concept such as achievement is primed in a way that the participants are not aware of their exposure to the concept (for instance, through displaying a woman winning a race on a sheet of paper with an unrelated task or by presenting achievement-related words in scrambled sentence word puzzles see e.g., Bargh, 2006; Latham et al., 2010). Subsequently, a measure is taken of human perception, motivation, behavior, or evaluation that relates to the domain of the prime (for instance, funds raised by call center agents, Shanz and Latham, 2009). The effect of priming is commonly explained in reference to network theories of memory. The prime activates concepts related to the prime and associated action repertoires, which lead to the observable response (Bargh, 2006; Custers and Aarts, 2010). The stronger the repertoires are, the stronger the effect of the prime. Thus, priming particularly impacts activities aligned with one's needs, motivation, or goals. Karremans et al. (2006), for instance, demonstrate that "subliminal priming of a brand name of a drink positively affected participants' choice for, and their intention to, drink the primed brand, but only for participants who were thirsty" (pp. 792).

Similarly, values theory suggests that priming is particularly influential along dimensions aligned with one's predominant personal values for which such repertoires are in place. In other words, our pro-social priming (of universalism values) should particularly impact individuals scoring high on the corresponding value. A second reason for expecting such interaction effects comes from recent empirical findings that emphasize affect as a mechanism whereby priming influences behavior. In particular, Custers and Aarts (2007, 2010) propose that primes linked to positive affect are rewarding and hence lead to stronger behavioral responses. There is evidence that, while subliminally presented rewards are not consciously perceived and processed, they are nevertheless effective and influence behavior (e.g., Bijleveld et al., 2014), and that subliminal primes linked to positive rewards achieve greater behavioral effects than subliminal primes devoid of reward potential (Aarts, Custers, and Marien, 2008). This combination of higher subliminal affect and greater rewards represents a second reason to expect a greater impact of our priming condition on those participants who value pro-sociality to a greater extent. Indeed, in a controlled incentivized contest experiment, Andersson et al. (2016) find a positive effect of supraliminal pro-social priming on team contest contributions by those individuals who score high on personal pro-social values.

To study the hypothesis that the charitable contributions of individuals with pro-social personal values are affected by subliminal pro-social priming, we elicit participants' personal values (Schwartz et al., 2001)

and personality measures (Costa and McCrae, 1992; Realo et al. 2009) one-week prior to the priming and donations in the laboratory. We perform the elicitation via well-validated psychological self-report measures, and we repeat the personal value and personality elicitation in the laboratory after the donation experiment. We also capture the participants' familiarity with each of the charitable organizations and the extent to which they value these organizations' work.

To verify the subliminity of the prime, we employ a novel incentivized objective threshold method in which the subject is shown the short-lasting stimulus and is then asked to reproduce that particular prime word by typing it on the screen. Our prime word reproduction task has two core advantages relative to existing methods: first, there are monetary incentives for the participant to make her best guess (some authors problematize that existing subjective threshold methods based on funneled questionnaires fail to include incentives; Simons et al. 2006). Second, since the participant must be able to reproduce each prime word, we can control whether the subject saw precisely that word and not merely whether the participant performs better than chance in a number of word reproduction tasks, as is the case in typical objective threshold methods. In objective threshold methods, the researcher verifies subliminity by allowing the participant, after each subliminal prime word, to choose between the correct prime word and a false alternative. Simons et al. (2006) criticize objective threshold methods on these grounds.[6] The disadvantage of these methods is that subjects who may be affected by the prime (and thus give more to charity in the donation experiment) may also be more likely to have the capacity to read the prime words during the control task. Indeed, results from the literature on semantic priming indicate that primed subjects are more capable of reading prime words that are semantically similar to the value-associated words with which the subjects have been primed (Aarts and Custers 2007). We discuss this issue in greater detail in Sections 5.3 and 5.4.

We first test the hypothesis of an overall effect of the pro-social prime on donations, but we cannot reject the null hypothesis of no effect. For a test of our second hypothesis, that the pro-social prime affects donations among individuals with strong pro-social preferences, we compare mean donations between the pro-social prime treatment and the neutral prime treatment for individuals scoring above the median level of pro-social inclination (as measured one week prior to the priming and donation experiment). We find support for this hypothesis in the data: the pro-social prime increases average donations by 11 percent in

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[6]See also Hannula et al. (2005) and the references therein.

this group[7]. This effect is robust to controlling for a range of personality measures, and a similar effect is found when interacting the pro-social prime with the personality characteristic of agreeableness (Big 5). We also control for the subliminity of the task, by means of the the prime-word reproduction control task described above. Our results are robust to adding a variable for the number of recognized words in the regressions but not to excluding subjects who recognized at least one word. The issue is complicated by the fact that priming as such seems to affect the ability to recognize the priming words in the subsequent control task; i.e., subjects in the pro-social prime treatment recognize significantly more words in the subliminity control task than do subjects in the neutral prime treatment.[8] We conclude that our results suggest that subliminal priming increases donations among individuals with high levels of pro-sociality, but further work is needed to confirm this result and to find still better ways of controlling for subliminity.

Priming research derives from social psychology, but there are few studies exploring the effect of the prime on incentivized economic behavior. Kamenica (2012) briefly reviews this small experimental economics literature on priming. Among priming studies, there are even fewer exploiting subliminal priming (see Bargh and Chartrand, 2000, for a classification of the priming conditions). The study closest to ours is Posten et al. (2014), who examine the effects of subliminal priming on trust in an investment game setup and find positive effects on both trust and beliefs concerning trustworthiness when subjects are primed with concepts of trust as opposed to concepts of distrust. They are primarily interested in the effects of priming on beliefs but speculate that similar effects might be found on the preference side. Indeed, due to the lack of strategic interaction and beliefs in our study, the priming effect we observe appears to be channeled through preferences. Hence, our studies are highly complementary and show that primes may work through both channels. Another related study comes from the field of emotion research in psychology. Zemack-Rugar et al. (2007) find that subliminally priming subjects with guilt emotion increases intentions to volunteer in charity work while priming sadness has no such impact. Thus, they conclude that exogenous variation through priming with emotions of similar valence can lead to very different outcomes. Pichon et al. (2007) find that subliminal priming of religion can lead to greater pro-sociality, manifested by picking up more pamphlets from charitable organizations after being primed. In terms of the interactive effects

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[7]When including all control variables, the marginal effect estimate rises to 17 percent.

[8]The reason for not controlling for subliminity when first showing the subjects the prime words is that we did not want to emphasize the private monetary incentives for writing correct prime words immediately before the donations. Variation in (expectations of) earnings in the reproduction task would have constituted a potential confound in understanding the effect of subliminity. This poses novel challenges for control task design in future work.

of primes with personality characteristics, Benjamin et al. (2010) use an economic experiment on ethnic identity to find that people from different racial backgrounds were differently sensitive to a prime. Damasio et al. (2011) find that subliminal priming may influence risk aversion in a gambling task.

The paper is organized as follows. In Section 2, we introduce the experimental procedures and present the hypotheses. Thereafter, in Section 3, we provide an overview of the pilot studies used to create the adopted design and report estimations of the power of our adopted experimental tests. Section 4 presents our main results, and in Section 5, we study their robustness. Section 6 concludes.

2 Experimental design and procedures

We use an experimental design with four core building blocks. The first is an elicitation procedure for measuring personal values and personality traits. To achieve this, we utilize two complementary methods: first, a Personal Value Orientation (PVQ) survey tool (Schwartz et al., 2001) and a thirty-item Big 5 survey tool (Realo et al., 2009), both of which are used by social psychologists and economists (see Lönnqvist et al., 2009; Becker et al., 2012). The second key element is an exogenous subliminal manipulation of goal formation, i.e. priming, of which subjects are unaware. This part is operationalized by using connotative words that appear on the screen prior to the actual decision task for a very brief duration (17 milliseconds) - a standard procedure in social psychology (Bargh et al., 2001). The third pillar consists of the 10 distinct charity decisions, each of which immediately follows a two-stimuli word manipulation (second pillar). The fourth consists of ex post controls and questionnaires, including a method for controlling for whether the priming was subliminal, a questionnaire on how well subjects knew the charities (familiarity) and how much they appreciate each charity (appreciation), and ex post (test-retest) questionnaires eliciting (a second time) the personal values and personality characteristics.

2.1 The priming procedure

We apply conceptual trait priming using a subliminal design (Bargh and Chartrand, 2000). Specifically, immediately before each charity donation decision, two consecutive subliminal priming stimuli appear on the screen. Each stimulus begins with a forward mask ##### that appears on the 60 Hz computer screen for 50 milliseconds, followed by an empty screen for 17 milliseconds, followed by the prime word for

17 milliseconds, then another empty screen for 17 milliseconds, and finally, a backward mask ##### for 50 milliseconds.[9]

The priming words are used to prime subjects in two alternative conditions: a pro-social -prime treatment, in which the prime words have connotations with pro-social universalism values (Uni treatment), and a neutral prime treatment without any value-laden connotations (Neu treatment) (see the Appendix). The prime condition is held constant for each subject throughout the session. Prime words for the pro-social prime are inspired by the words listed among the universalism items of the Schwartz Value Survey (Schwartz, 1992), which lists, for each value, a series of synonymous or specifying words (see the Appendix). Universalism values emphasize goal formations that relate to understanding, appreciating, tolerating, and protecting the welfare of all people and nature (Schwartz, 2006). The distributions of the lengths of the prime words are identical in the two treatment conditions (the lengths of the primes words vary from 5 to 17 letters). Of the 20 prime words in each condition, two are presented prior to each charity decision. The charity decision is then made according to the instructions on the screen. Thereafter, two new priming stimuli appear. No prime word appears twice during the 10 decisions.

2.2 Elicitation of personal values and personality traits

One week before the actual lab experiment, the subjects completed a 40-question PVQ questionnaire (Schwartz et al., 2001) and a thirty-item Big 5 questionnaire (Realo et. al. 2009) using the internet-based Webropol survey tool.[10] In a subset of the sessions, they also completed the PVQ questionnaire *after* the computerized part in the lab and prior to pay-out (test-retest design), but the results reported here use the pre-elicited data.[11] At the end of the post-elicitation phase in the lab, we also elicited gender and age. We elicited values before the experiment to ensure that the elicitation of personal values was not influenced by the subject's experiences during the experiment in the lab. In the Appendix, we conduct an analysis comparing the pre- and post-experiment elicited values. Although we observe slightly higher values (see Table 8) in the ex post questionnaire, compared to the ex-ante evaluation, the correlation between the two

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[9]Visual masking is used to reduce the visibility of the prime stimuli through the presentation of a second brief stimulus, i.e., the "mask" (Breitmeyer and Ogmen, 2007).

[10]See Tables 5 and 6 for correlations among the different dimensions of each personality measure.

[11]The second elicitation ensured that a questionnaire was completed by each participant that completed the charity donation task - a participant might arrive at the lab without having completed the pre-questionnaire. In addition, by comparing the post-elicited and pre-elicited PVQs, we can evaluate whether the laboratory task consistently biases the PVQ measure.

is high and there are no substantial differences between the two treatments (see Table 7).

2.3 The charity decisions

The decision tasks consisted of donations to 10 different Finnish and international charitable organizations that are among the best known in Finland (see the Appendix for a translation of their names). The order of the tasks/organizations was the same for each subject. The subject received on-screen instructions whenever a charity donation decision was to be made. Each decision consisted of sharing 20 euros between the participant and the charitable organization, the name of which appeared at the top of the decision screen (see the Appendix). The subject could alter the share assigned to her/him and to the organization by pressing buttons as guided on the screen. The provisional division also appeared on the screen. The subject would confirm the division by pressing an instructed button. As explained in the written instructions handed to the subject prior to the experiment, one of the ten charity decisions was randomly drawn after the computerized part of the experiment. The participant and the, thus, randomly chosen charitable organization was remunerated according to the corresponding decision of the participant once the laboratory procedures were complete.

Control for subliminity of the prime

Once the actual charity donation tasks were completed, the instructor arrived at the cubicle and set up another computerized stage of the experiment. The subject began this stage by typing in a personal but anonymous identification code. Each of the 20 prime stimuli were presented one at a time with the same timing as in the actual priming sequence. After each stimulus, the subject was asked to reproduce the sequence of letters she/he saw on the screen. Two out of the 20 words were randomly drawn after the computerized part, and the participant was paid one euro for each correctly reproduced word. This task was designed to determine whether the priming was truly subliminal or a subject could read some of the words. The advantage of the subliminal priming was that if the subjects were in fact unable to consciously read the words appearing in the subliminal stimuli, they could not possibly consciously associate the prime words with the items of the PVQ questionnaire, and thus, we could minimize any demand effects. For this to be effective, we needed a sound method for controlling for subliminity.

Control for charities

In a third computerized part of the experiment, each participant was given on-screen instructions to rate each of the ten charities in turn, first in terms of how well the participant knew the organization (familiarity), and then in terms of how much the participant valued the work of the charity (appreciation). Both items were rated on a scale from 1 to 5.

2.4   Laboratory procedures

Subjects were recruited using the ORSEE software (Greiner, 2015), and the computerized tasks in the laboratory were programmed and conducted using NBS-Presentation software. The experiments were conducted on four occasions (sessions) between May 2013 and April 2014. The same staff member was always present to communicate with the subjects (in addition to the experimenter).

An invitation to participate in a scientific decision-making experiment was sent to 1088 registered subjects in the PCRClab subject pool in Turku of which approximately 91 percent are students at the University of Turku. Psychology students were excluded due to their potential familiarity with priming methods and potential uncontrolled demand effects. The enrolled participants arrived according to a predetermined schedule in fifteen-minute intervals. Two persons were scheduled at a time since we had only two computers with the high time-resolution software needed for controlling the duration of the stimuli. The identity of each subject was checked. When several subjects were seated in the corridor waiting their turn, they sat separately without seeing one another. The first in line was given the opportunity to read through the instructions without being allowed to communicate with others. Once the subject had read the instructions and there was a vacant computer, she/he was allocated a computer located in a visually isolated cubicle in the laboratory. The instructions were also posted next to the computer. The subject was guided to proceed according to the instructions.

The same two computers were used in all sessions. The treatment condition was varied at the computer level and from subject to subject in an alternating manner in the order of arrival at the specific computer (to indirectly control for any computer-specific or seat-specific differences and to exclude any hour-of-the-day or other sequence specific effects). There was no consistent pattern regarding the first arrival being allocated a certain computer or a certain treatment.

The subject entered her/his personal anonymous code (see Appendix) that was used to associate the pre-elicited data with the laboratory data, and the experiment then automatically started. Once the charity choices were made, a second computerized stage began in which the subliminal prime stimuli were again presented to the subject one at a time. On-screen instructions asked the subject to reproduce the letters or symbols that had appeared on the screen (see above) by typing the letters/symbols and pressing enter (many participants typed the mask, $\#\#\#\#\#$ or left the space empty, supposedly due to their inability to see the prime word or its letters). In the third computerized stage, each participant rated the ten organizations according to how familiar the subject was with the organization and how much she/he appreciated its work.

Once all decisions were completed, the payoff-relevant decision was drawn and the remuneration was calculated based on the charity choice and on how many of the two randomly drawn prime words the subject could read. Before paying the remuneration to the subject in cash, the second elicitation of the PVQ questionnaire was administered. An average of 40 minutes was required to complete the laboratory stage of the study.

Hypotheses

Our first hypothesis states a simple positive effect of subliminal priming on the charity contributions.

Hypothesis 1: There is a positive effect of the universalism prime on the donations.

As argued in the Introduction, theoretically, priming activates existing knowledge structures and thus triggers and strengthens underlying principal motivational goals. Therefore, we expect the universalism prime to primarily affect donations among individuals with strong universalism values (pro-social individuals). However, even if the universalism prime increases donations only for individuals with strong universalism, the overall mean should be higher in the universalism prime group than in the neutral prime group (albeit not necessarily significantly so if the participants with strong universalism values are not numerous or if the effect of priming on these persons is small), as long as the universalism prime does not have a negative effect on the donations in some group of subjects.[12] This is thus a motivation for testing

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[12]A study by Andersson et al. (2016), using a supraliminal pro-social priming method, suggests that a negative effect of the universalism prime cannot be ruled out in subjects with low universalism values; this is therefore also a motivation for Hypothesis 2 (to test for a positive effect of the universalism prime among only subjects with strong universalism values).

Hypothesis 1. As a second hypothesis, we also test whether there is a significant effect of the universalism prime among individuals with strong universalism values; a high universalism value is here defined as a personal universalism value above the median.[13]

Hypothesis 2: There is a positive effect of the universalism prime on the donations of those participants whose personal universalism value score is above the median.

3 Pilot studies, sample size and statistical power

Our study is inspired by a recent study by Andersson et al. (2016). They report that teams consisting of pro-social individuals provide greater effort for the team when primed with self-transcendence-value-laden word scrambles (universalism and benevolence values). The effect of the self-transcendence prime on pro-self-motivated agents (power and achievement values) was the opposite - their effort for the team was reduced. The negative effect was not predicted by the theory proposed in the study, and the authors were puzzled by these results. In this study, we examine a related effect – that of the match between personal value-driven goals and the prime on charitable giving.

We conducted a number of pilot studies that led to the design of the main study. These pilot studies are briefly described in Appendix F. Our last pilot experiment was conducted in Turku on 24-25 October and 4 and 11 December, 2012 (n=44). It differed from the present design only in that the benchmark condition used a pro-self priming (with connotations of both power and achievement values) instead of a neutral priming condition without any connotations. For the main experiment, which is the focus of this paper, we changed the pro-self priming to a neutral prime, to be able to identify a clean effect of universalism priming without confounding it with the effects of the pro-self prime.

To estimate the statistical power and sample size needed for the main study, we used the observed standard deviation of 4.85 from the final pilot experiment with n=44 (i.e., the standard deviation of the average donation across the different charities). We wanted to have a sufficient sample size to be well powered to detect a medium-sized effect (i.e., Cohen's d=0.5; Cohen, 1992) when testing Hypothesis 2 (the test in the sample with a universalism value above the median).[14] We decided to include approximately

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[13]In the Appendix, we study the robustness of the above-stated interaction effect using the Big 5 agreeableness measure, which can arguably be considered to be correlated with universalism (Parks-Leduc et al., 2015).

[14]With a standard deviation of 4.85, a Cohen's d=0.05 implies an effect size of 9.7.

300 subjects in total, which implies a sample size of 150 for testing Hypothesis 2. This provides us with 86 percent power to detect a medium-sized effect for Hypothesis 2; for Hypothesis 1, where we include the total sample, the power is 99 percent of detecting a medium-sized effect (but if the universalism prime only affects donations in individuals with high universalism, this would decrease the expected effect size and consequently the power of the test of Hypothesis 1).

4   Results

4.1   Data description

Ultimately, 307 subjects took part in the main experiment (153 in Neu and 154 in Uni). To ensure that we did not violate the subject's trust in anonymity, we did not want to control for whether they had completed the questionnaire before letting them into the lab, and consequently, some of the participants in the main experiment had not completed the ex ante questionnaire. Of the 307 subjects that participated in the experiment, 285 also completed the ex ante questionnaire. Since the pre-experiment personal value and personality questionnaires were completed at home one week before the experiment, we did not have full control of the pre-experiment data collection. Unfortunately, some participants had not completed the questionnaire when they registered at the lab. Each participant self-generated an anonymous code according to the same set of detailed instructions both at home in the online questionnaire and at the lab. This code was used to match the pre-data with the lab data. Some participants failed to generate a code in the lab that matched a code in the pre-data. Due to these issues, the sample size varies somewhat as we include more controls. However, the pre-elicitation of the value and personality measures was important for the reasons explained in Section 3 and since ex post elicited values could be influenced by the priming treatment itself.[15] Table 1 reports average donations by charity (Finnish translations of the names of the charities are available in the Appendix), by the prime and by whether a subject's universalism score from the PVQ is above or below the sample median.[16] The division of the sample into these two sub-categories is motivated

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[15]Due to a technical error, the gender and age variables were not collected for all subjects, and we therefore do not include them in the main analysis. We, however, report the results from regressions with these variables in the Appendix. Overall, we find a positive effect of gender on charitable giving, but once we control for personality characteristics, the gender effect is halved and becomes insignificant. This is likely because many of the gender effects are captured by our multi-faceted personality measures.

[16]To correct for individual differences in the interpretation of the response scale, we follow the literature and center each respondent's response around his/or her mean response to all 40 questions (see Schwartz, 1992). Our conclusions do not

Table 1: Average charitable giving by charity and prime

Charity	Below median universalism		Above median universalism	
	Neu prime	Uni prime	Neu prime	Uni prime
Foreign Aid of the Finnish Lutheran Church	5.446	6.321	7.455	8.842
The Association of the Friends of the University Hospital for Children	10.631	9.974	10.046	11.711
Medecins sans Frontieres	8.123	7.372	9.420	11.329
The Mannerheim League for Child Welfare	9.662	9.295	10.489	11.776
Save the Children	10.000	9.526	10.921	11.763
Plan	9.031	8.667	10.091	11.447
Red Cross Catastrophe Fund	11.108	10.872	12.489	13.211
SOS Children's Villages	9.477	9.244	10.625	11.895
UNHCR and Finnish Refugee Help	8.585	9.269	11.125	12.118
WWF	8.923	9.103	11.182	12.105
Average	9.098	8.964	10.384	11.620

by Hypothesis 2, i.e., the effect of the prime is expected to be strongest among those subjects with values in line with the prime. From this table, we can conclude that the effect of the prime is more pronounced among those with high universalistic values. Indeed, whereas the effect is positive among those with above-median values, the effect is slightly negative among the others. Appendices A1 and A2 summarize the Big 5 (Realo et al. 2009) and PVQ measures (Schwartz, Melech, Lehmann, Burgess, Harris, and Owens, 2001).

4.2 Main analysis

Overall, charitable giving to each of our ten charities is slightly higher under the universalism prime than under the neutral prime (Neu=9.838; Uni=10.275). However, the difference is not statistically significant under the non-parametric or the parametric test (Mann-Whitney U-test: p=0.507; t-test: p=0.388) using the individual average of charitable giving across the treatments. (Since each participant was exposed to a single priming treatment, all tests reported are between-subjects tests.) Thus, for Hypothesis 1, we cannot reject the null hypothesis. For Hypothesis 2, however, we find a significant difference in the average, (t-test: p=0.076) but not when using a non-parametric test (Mann-Whitney U-test: p=0.1378), donation across the two treatments for subjects with a universalism measure above the sample median. Although, we do not have a specific hypothesis concerning the priming effect for the subjects with below-median universalism, we also present these test results for completeness. The point estimate of the universalism prime is negative

change if we refrain from such a normalization.

Table 2: OLS on all subjects

VARIABLES	(1)	(2)	(3)	(4)
	Dependent variable: Charity contribution			
Prime	0.437	0.495	0.558	0.555
	[0.505]	[0.501]	[0.430]	[0.408]
Charity/session fixed effects	NO	YES	YES	YES
Charity controls	NO	NO	YES	YES
Personality controls	NO	NO	NO	YES
Constant	9.838***	5.970***	-3.924***	-24.09
	[0.351]	[0.797]	[0.869]	[24.15]
N	307	307	302	282
R-squared	0.002	0.061	0.321	0.403

Notes: Robust standard errors clustered at the subject level, *** $p<0.01$, ** $p<0.05$, * $p<0.1$.

Prime takes value 1 for Uni. Charity/Session includes charity and session fixed effects. Personality controls

for the PVQ and Big 5 items. Charity controls include controls for familiarity with and appreciation of the charity.

in the below-median universalism group, but the effect is not significant ($p=0.8188$ for the Mann-Whitney test and $p=0.8526$ for the t-test).

Table 2 reports the results from four regressions using the entire sample with an increasing set of control variables. As is clear from the results, there is no significant treatment effect in general, although the regressions indicate that charitable giving tends to be higher under the universalism prime.[17]

Tables 3 and 4 report the regression results for those above and below the median in universalism, respectively, using the same specifications as in Table 2. Figure 4.2 summarizes the findings for the most general specification (model 4) by presenting the predicted marginal effect of the prime on an average subject in each sample.

Returning to Table 3, we observe an overall significant and positive effect of the universalism value prime on subjects who score above the median in universalism value, which is in line with Hypothesis 2. The effect becomes slightly stronger in magnitude and significance level as we add control variables. For an average subject in the sample scoring above the median on universalism, there is a 12-17 percent marginal effect (depending on the model specification) on the charitable donations due to pro-social priming.

For subjects below the median in universalism, the average effect of the universalism prime is slightly negative (albeit not significantly so) (Table 4). These effects are analogous to the findings of Andersson

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[17]For reasons explained previously, our sample becomes smaller when we add controls (Charity and Personality controls); see models (1)-(4) in Table 2. In the Appendix, we conduct the same analysis (see Tables 23-25) as below but keeping the sample fixed at the minimal size (i.e. n=282).

Figure 1: Plots of the predicted marginal effect for an average subject in each subsample.
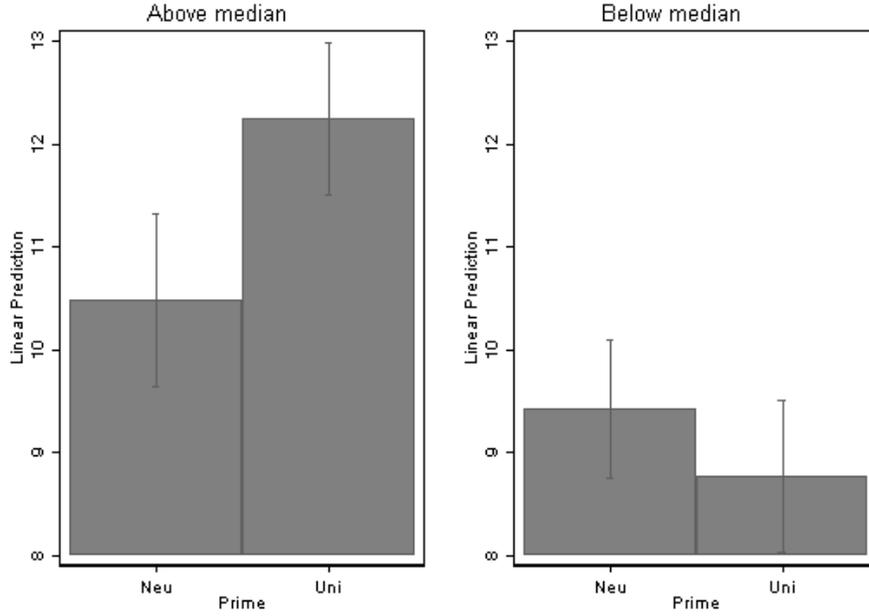
et al. (2016), where the pro-socially oriented increase their effort and the pro-self oriented decrease their effort due to supraliminal pro-social priming in team contests. In Andersson et al. (2016), however, both the positive priming effect in the pro-socially oriented group and the negative priming effect in the pro-self group were statistically significant.

5   Robustness

In this section, we report a number of robustness checks of the above analysis. We begin by using interaction effects instead of dividing the sample and then turn to an analysis in which we use a different measure of pro-socialness (the Big 5 agreeableness measure). Subsequently, we analyze whether our results are affected when controlling for the individual ability to read the prime words. Overall, our results are robust to such extensions. The only notable difference appears when we simply exclude all subjects who were able to detect any of our prime words in the ex post control task. When we do so, Hypothesis 2 fails to hold in many specifications. We discuss the possible reasons for this in that section. For sake of space, all tables in this section are reported in the Appendix.

Table 3: OLS on subjects with above-median universalism

VARIABLES	(1)	(2)	(3)	(4)
	Dependent variable: Charity contribution			
Prime	1.257*	1.473**	1.766***	1.767***
	[0.700]	[0.720]	[0.594]	[0.596]
Charity/session fixed effects	NO	YES	YES	YES
Charity controls	NO	NO	YES	YES
Personality controls	NO	NO	NO	YES
Constant	10.75***	7.863***	-2.790*	-30.87
	[0.456]	[1.258]	[1.457]	[34.52]
N	143	143	142	142
R-squared	0.014	0.076	0.308	0.394

Notes: Robust standard errors clustered at the subject level, *** p<0.01, ** p<0.05, * p<0.1.

Prime takes value 1 for Uni. Charity/Session includes charity and session fixed effects. Personality controls

for the PVQ and Big 5 items. Charity controls include controls for familiarity with and appreciation of the charity.

Table 4: OLS on subjects with below-median universalism

VARIABLES	(1)	(2)	(3)	(4)
	Dependent variable: Charity contribution			
Prime	-0.134	0.00585	-0.248	-0.648
	[0.716]	[0.725]	[0.614]	[0.512]
Charity/session fixed effects	NO	YES	YES	YES
Charity controls	NO	NO	YES	YES
Personality controls	NO	NO	NO	YES
Constant	9.098***	4.474***	-4.126***	-5.035
	[0.513]	[0.986]	[1.185]	[33.29]
N	143	143	140	140
R-squared	0.000	0.077	0.353	0.476

Notes: Robust standard errors clustered at the subject level, *** p<0.01, ** p<0.05, * p<0.1.

Prime takes value 1 for Uni. Charity/Session includes charity and session fixed effects. Personality controls

for the PVQ and Big 5 items. Charity controls include controls for familiarity with and appreciation for the charity.

5.1 Interaction effects

The main analysis, using the above- and below-median samples of universalism, can be criticized for being arbitrary regarding the selection of the cutoff point (the median in our case). Therefore, we also conducted a regression analysis in which we introduce interaction effects between the prime and universalism. Table 9 in the Appendix reveals that the interaction effect has the correct sign but is only significant once we control for personality and charity fixed effects.

5.2 Regression analysis using other measures of pro-socialness

We also reproduce the main analysis but replace the universalism personal value measure used above with a related pro-social personality trait measure, the Big 5 agreeableness measure. (The correlation between universalism and agreeableness is significantly positive at 0.284 with a p-value of 0.000.) We conduct a regression analysis on those who score above the median in the studied measure of pro-socialness and on those who score below the median. Tables 10 and 11 (in the Appendix) report regression results for subjects above and below the population median of the Big 5 agreeableness measure. Following our procedure in the main analysis, in Figure 2, we summarize the findings from the most general specification by presenting the predicted marginal effect of the prime on an average subject in each sample. Although weaker, the findings corroborate those using the universalism measure.[18]

5.3 Controlling for the subliminity of the prime

To ensure that the prime was truly subliminal, we conducted an explicit laboratory procedure to control for this. The subjects were asked to perform the control task immediately after the charity decisions. The control task is described in detail in Section 2, and it essentially checks for the capacity to read the words that were used as the subliminal stimuli. If the subjects are capable of reading the words, the stimuli are arguably not truly subliminal but rather consciously perceived.

Figure 3 presents a histogram over the number of recognized words. A complicating feature of the control measure for subliminal priming is that more words are recognized under the universalism prime than under the neutral prime despite that the distributions of the length of the prime words were identical in the two

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[18]We do not find a significant difference for the average individual donation across the two treatments for subjects with a Big 5 agreeableness measure above the sample median (t-test; p=0.229; Mann-Whitney U-test:p=0.349).

Figure 2: Plots of the predicted marginal effect for an average subject in each subsample (above- and below-median agreeableness, Big 5).
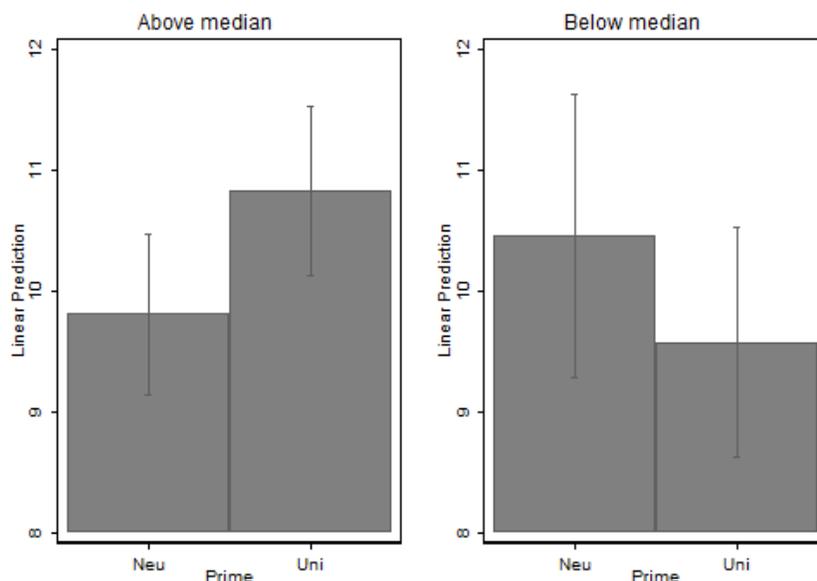
treatments. This difference is confirmed by both a t-test and a Mann-Whitney U-test (p-value=0.001). This indicates that the priming may not only affect the charity decisions themselves, but there may also be a similar priming effect on the capacity to read and understand words that have connotations associated with one's predominant values, i.e., the charity-priming task influences the control-priming task in a manner typical of the purported priming effect.

The difference in recognized words between the two treatments suggests that our method for controlling for subliminity is not unproblematic. It also illustrates some of the problems with existing objective threshold methods, as subjects might actually be able to read some words, while in a large sample, the choices nevertheless appear approximately random, and thus, such participants are judged as qualifying for subliminity. Results from the literature on semantic priming indicate that primed subjects are more capable of reading prime words that are semantically similar to the value-associated words with which the subjects have been primed (Aarts and Custers, 2007). Indeed, one can view our finding concerning the asymmetries in reading capacity across prime conditions from this perspective: our pro-social prime might have been powerful enough to impact the reading capacity of the words with pro-social connotations in the ensuing control task.[19] In other words, the pro-social prime might have not only impacted the charity

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[19] Language of cooperation and mutual concern (some of the words priming universalism) is considerably more important for survival and fitness than arbitrary neutral words used in the neutral prime. Evolutionary arguments suggest that we should

Figure 3: Number of recognized words by treatment.

Graphs by Prime
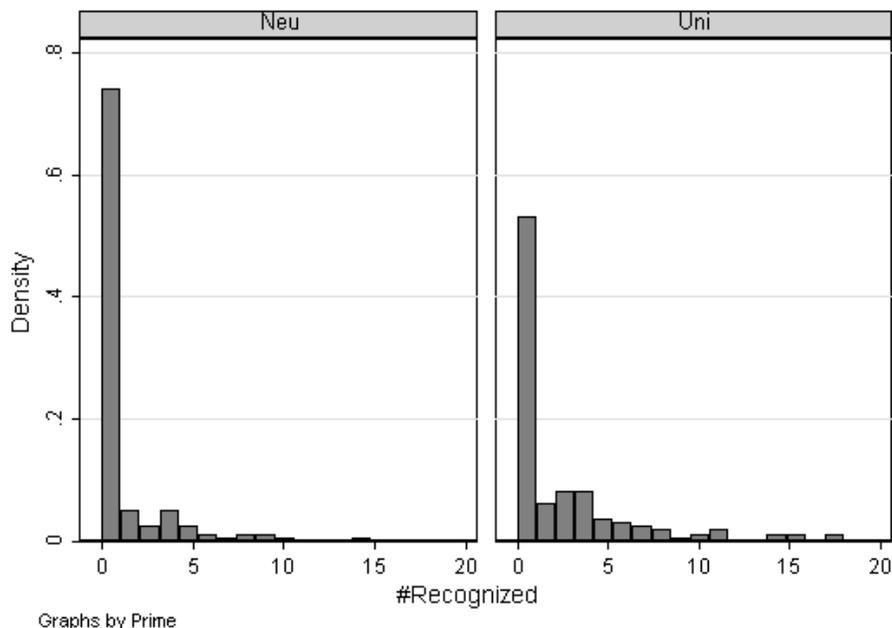
donations but also the word-reading capacity in the control task.[20] Bearing this caution in mind, we present a set of regressions in which we control for the number of recognized words.

We begin by simply including the number of recognized words (#Recognized) as a control variable in the regressions reported in the main analysis (see Tables 12, 13 and 14 in the Appendix for the corresponding tables). This additional control does not have any major impact on the previously reported results, i.e., we still find a significant impact for those with values in line with the prime. Figure 4 summarizes the results by showing the marginal effect for an average individual in each sample for the most general model in each specification (in Tables 13 and 14). Note, however, that these results need to be interpreted very carefully, as the number of recognized words appears to be affected by the prime (and is thus an endogenous variable).

We can alternatively control for the reading capacity by dropping the data from any subjects who were capable of reading one or more of the words.[21] We present the results of the corresponding regressions in

be more capable of perceiving the former type of stimuli, and this could contribute to the fact that participants are more able to read the pro-social prime words. (Barkow et al., 1995).

[20]We ran regressions with #recognized as the dependent variable using the data from the universalism prime sessions; see Table 18. The results (presented in the Appendix) illustrate that the positive interaction effect between personal values and the corresponding prime is of the correct sign but statistically insignificant in our study.

[21]However, note that since reading capacity is correlated with the prime, we might drop variation associated with the variation that is at the heart of our study. Some experts in the field of priming in social psychology strongly discourage scholars from providing multiple-choice options asking "which of these words did you see" as a method for controlling for and measuring subliminity (see p. 10, section on "Awareness checks for subliminal priming tasks" in Bargh and Chartrand 2000).

Figure 4: Margins plot of the marginal effect for an average subject in each subsample, controlling for reading capacity.
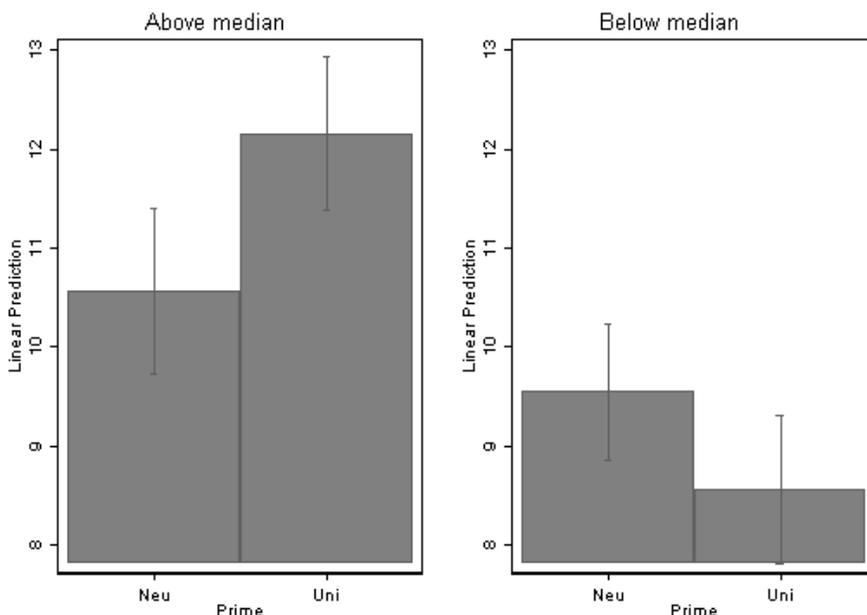
Tables 15, 16, and 17 in the Appendix.

The analysis of these regressions reveals that excluding subjects with the capacity to read at least 1 of the 20 words has a negative impact both on the level and statistical significance of the estimated priming effect. Indeed all coefficients are now lower and only significant (at the 10 percent level) in the specifications with many controls (models 3 and 4). The latter may simply be an effect of a smaller sample (N=170 vs N=105), but the former may be due to the fact that participants' donations react more to consciously visible pro-social prime words than to subliminal prime words. Due to the endogeneity between the prime and the capacity to read the prime words, these results are also difficult to interpret (it creates a selection problem in comparing the two treatments).

Note further that our measure of the capacity to read the prime words may, in general, overestimate the number of subjects for whom the prime in the donation task was consciously perceived for the reasons explained above (i.e., subjects may recognize more prime words in the control task when they see the words for the second time than they did during the donation task). Previous priming research indeed suggests that priming may influence not only behavior and motivation but also perception: perception capacity

The funneled questionnaire method is suggested as an alternative. Simons et al. (2006) critically discuss the advantages and disadvantages of both of these methods.

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tends to be selective and depend on individual motivational goals. Priming itself may have impacted the accessibility of the previously subconsciously observed words (see Bargh and Chartrand, 2000, pp. 10) and especially so in the universalism treatment (where the words are associated with personal goals for some participants) and not in the neutral priming condition (where the prime words are not associated with particular values or goals). In the Appendix in Tables 18 and 19, we report regressions with the capacity to recognize the prime words as the dependent variable, and we find quite large coefficients consistent with such a perception effect of pro-social priming increasing with the importance of the universalism value, although the effects are not statistically significant.

We conducted this robustness check regarding reading capacity to control for the hypothesis that our prime is not unconscious and the identified effect on charitable giving is driven by a experimenter demand effect (Zizzo, 2010), whereby subjects behave in accordance with the hypothesized priming effect when consciously observing a pro-social prime stimulus. In such a case, the prime is not subliminal but consciously perceived, and one would expect that the emerging demand effect also affects the results of our ex post PVQ value questionnaire that was conducted at the end of the experiment (approximately 5 minutes after the subject had completed the reading-capacity control task). That is, if the subject is consciously aware of being pro-socially primed and this conscious priming influences donations, then this priming effect might also be exhibited as higher ex post reported universalism values for such a subject. Contrary to this hypothesis, the ex post measures of universalism values are actually lower under the universalism prime (Neu: mean=1.167; Uni: mean=1.134) and there is no significant difference between treatments in pre-measured universalism (see Table 7 in the Appendix). The lack of difference in the pre-measured universalism supports the view that randomization to treatments has been properly conducted.[22]

5.4   Capacity for detecting implicit and explicit perception

The control task we used differs from those typically employed in priming studies in social psychology, where either (1) a funneled questionnaire (subjective threshold method) or (2) a two-alternative choice task is used (objective threshold method; see Hannula et al., 2005, and Simons et al., 2006, for critical reviews). The funneled questionnaire essentially asks the subject what she/he thinks the purpose of the

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[22]See also Table 8 in the Appendix illustrating a tendency for higher reports for all value and personality measures under laboratory circumstances after the experiment than in less-controlled circumstances in which subject respond though the Webropol survey tool over the internet.

priming stimuli were. This method has been criticized for not providing sufficient incentives for the subjects to express a concern for an experimenter's attempt to subliminally influence decisions. If the subject is hesitant and feels such a story is far-fetched, she/he might not write about his/her concerns despite such suspicions. Our method overcomes this problem by directly asking what the subject saw and providing monetary incentives for attempting to answer correctly even when there is only a faint idea of what the stimuli might have been. In the two-alternative choice task, which is also used in the existing literature, the subliminal priming stimuli item is first shown to the subject. Then, she/he is offered two candidate words, of which one is correct and the other is incorrect. No monetary incentives are typically provided for giving correct answers. Moreover, only a large sample of trials allows the researcher to convincingly conclude whether the participant is capable of reading the prime words and performing better than chance in matching a correct alternative with the prime stimulus. Hannula et al. (2005) summarize the caveats associated with the two-alternative objective task as follows: "The primary challenge for this approach is to provide definitive evidence that conscious awareness is entirely absent and that performance is truly at chance. Distinguishing null sensitivity from low-level sensitivity requires many trials — more than have typically been used in studies of implicit perception. Moreover, if conscious sensitivity varies over time, then even showing null sensitivity across a large set of trials might not provide sufficient evidence for the absence of awareness." Our method overcomes these challenges: we can convincingly conclude, for each prime word, whether the participant was capable of reading the word. Moreover, we provide monetary incentives for performance, and hence, there are monetary incentives to offer even seemingly far-fetched and/or faint impressions of what one might have seen.

Let us attempt to quantify the advantage that our novel objective subliminity test method provides with respect to a typical two-alternative implicit perception control task. In our study, 129 participants out of 307 (approximately 42 percent) who could read at least one of the 20 prime words. Success in our task (being able to write down the word one saw) implies that, in a two-option task, one would be able to choose the correct one of the two provided alternatives with certainty. Yet, the words one cannot see would have to be guessed. The success rate when guessing in a two-option task is 50 percent, and a subject randomly guessing all 20 words would have a less than 5 percent chance of getting 15 or more correct. Thus using a p-value of 5 percent, such a participant would be considered capable of reading the words in a two-option task. Let us apply these ideas to our setup. Using the binomial distribution, we can calculate

the probability of getting more than 15 words correct when the participant can see n words for certain and must pick randomly in 20 − n of the cases. Our direct subliminity test provides information about n for each subject, and we can thus calculate the probability of getting more than 15 correct conditional on n for each subject. We then use those individual probabilities and simulate a sample of 10 000 draws for the profile of 307 subjects and, for each draw, count the average number of subjects that would be classified as capable of reading the words in a two-alternative task. The average number of subjects thus classified in our simulation is 15.76 out of 307 participants. In none of our simulated 10 000 draws was the number of subjects so classified 28 or above. The probability of classifying 129 subjects as capable of reading some of the words is virtually zero. The difference between these two measures provides a way of quantifying the added capacity of our novel method of measuring the subliminity of the task. Naturally, by increasing the number of alternatives (say a 5-option rather than a 2-option task) would render the gap smaller, but for any number of options, our method provides superior information about the capacity to read the prime words. We should also note that there are similar challenges in detecting differences in subliminity differences across the priming conditions. A typical objective subliminity test would not be able to detect a difference in the capacity to read the prime words, as participants in the pro-social priming condition do not perform sufficiently better to qualify as better than within the limits of pure chance.

6 Conclusion

In a controlled, randomized experiment, we vary a subliminal prime prior to charity donation decisions. There are two alternative primes: one with connotations of pro-social universalism values and another without any particular value-laden connotations (neutral). For the full sample, we do not find a significant priming effect. However, we find a positive effect of the universalism prime on charitable giving among those with strong universalism values. That the priming effect increases with the degree to which individuals hold strong pre-existing pro-social preferences is in line with theoretical predictions and suggests that to be effective, a prime has to align with underlying values. In turn, such an effect is likely to be stronger for a deserving recipient, such as a charity, than when the recipient is a randomly drawn student subject (Eckel and Grossman, 1996). With a deserving recipient, the primed pro-social motivational goals aligned with one's values should be particularly powerful, and thus, connected action repertoires will be more easily

activated (Aarts et al., 2008; Shantz and Latham, 2009).

When controlling for the capacity to recognize the prime words, the results are less clear. Using the number of recognized prime words as a control leaves the main priming result unchanged, but excluding those with the capacity to read at least one of the words nullifies the result. How should these mixed results be interpreted? Our subliminity control task reveals substantial heterogeneity in human capacity to read words rapidly. There are few participants who were able read all and even the longest of the prime words, but a substantial minority could read at least one of them. If we exclude this minority, we lose some of the statistical significance and the positive coefficients are smaller. The heterogeneous capacity to read even word stimuli of 17 ms duration casts doubt on one-size-fits-all prime durations in subliminal priming studies and suggests that prime duration should be adjusted individually (Bargh and Chartrand, 2000) or that pre-tests of individual subliminity should be performed, as was the case in this paper. This latter strategy faces yet further challenges discussed in Bargh and Chartrand (2000).

We find that the fraction of participants capable of reading the pro-social prime words is higher than the fraction of participants who are capable of reading the neutral prime words (although the word-length distributions are identical in these treatment and control conditions). This suggests that the universalism vs neutral priming that took place before the donation decisions differentially influenced participants' perception capacities in the subliminity control task. Previous priming research indeed suggests that priming may influence not only behavior and motivation but also perception: perception capacity tends to be selective and depend on individual motivational goals. Priming itself may have impacted the accessibility to the previously subconsciously observed words (see Bargh and Chartrand, 2000, pp. 10). This should be especially the case in the universalism treatment (in which the words are associated with personal goals for some participants) and not particularly so in the neutral priming condition (in which the prime words are not associated with any particular values or goals). When we run regressions with the capacity to recognize the prime words as the dependent variable, we find large coefficients consistent with such a perception effect of pro-social priming increasing with the importance of the universalism value, but the effects are not statistically significant. Such effects imply that our measure of the capacity to read the neutral prime words overestimates the number of subjects for whom the prime in the donation task was subliminal, especially in the pro-social (universalism) priming condition. That the two alternative primes also appear to differentially affect the ability to recognize the prime words in the control task makes it

difficult to control for the subliminity of the prime in the donation task. By providing a novel and arguably more reliable control task and carefully studying awareness using this new measure, our findings add to the skeptical criticism that challenges the awareness methods used in the implicit perception literature (Hannula et al. 2005; Simons et al., 2006). However, it should be noted that our results suggest that even when conservatively controlling for awareness, we do find a residual weakly significant effect on charitable donations among participants with strong pro-social preferences. Further research is needed, but we hope that our new incentivized awareness control encourages developments that lead to a better identification of implicit perception.

We conclude that we fail to find support for a substantial priming effect in the overall sample; however, our results suggest that subliminal priming increases donations among individuals with high levels of pro-sociality. This result needs to be interpreted cautiously, and further work is needed to establish whether this is a robust finding.

Appendix

A   Additional tables and regressions

A.1   Correlations

In Tables 5 and 6 we report correlations between the ex ante measured personal values and personality traits.

A.2   Randomization and difference between ex ante and ex post questionnaire responses

In Table 7, we report on average reported values in the ex post and ex ante personality questionnaires. Please note that the sample in the ex post column is a subset of the entire sample.

Table 8 reports a comparison between ex ante and ex post values along with p-values from a non-parametric Wilcoxon matched pairs test.

Table 5: Correlations: PVQ

	Benevolence	Universalism	Achievement	Power	Conformity	Tradition	Self-direction	Stimulation	Hedonism	Security
Benevolence	1									
Universalism	0.33	1								
Achievement	-0.42	-0.52	1							
Power	-0.41	-0.54	0.5	1						
Conformity	-0.07	-0.18	-0.17	-0.12	1					
Tradition	0.02	-0.12	-0.31	-0.14	0.39	1				
Self-direction	-0.09	0.41	-0.17	-0.21	-0.38	-0.26	1			
Stimulation	-0.09	-0.17	0.05	0.03	-0.41	-0.27	0.15	1		
Hedonism	0.02	-0.15	0	0.06	-0.33	-0.25	-0.18	0.28	1	
Security	-0.2	-0.23	-0.02	-0.04	0.26	0.12	-0.29	-0.43	-0.27	1

Table 6: Correlations: Big 5

	Big5 Emotional stability	Big5 Extroversion	Big5 Openness	Big5 Agreeableness	Big5 Conscientiousness
Big5 Emotional stability	1				
Big5 Extroversion	-0.12	1			
Big5 Openness	-0.02	0	1		
Big5 Agreeableness	-0.03	0.03	0.16	1	
Big5 Conscientiousness	0.15	0.03	-0.11	0.12	1

Table 7: Questionnaire responses before and after experiment by prime

	Ex ante			Ex post		
	Neu	**Uni**	**p-value**	**Neu**	**Uni**	**p-value**
Benevolence	1.103	1.099	0.875	1.107	1.100	0.721
Universalism	1.167	1.134	0.080	1.161	1.114	0.074
Achievement	0.975	1.021	0.105	0.961	1.007	0.218
Power	0.808	0.826	0.385	0.820	0.836	0.475
Conformity	0.902	0.874	0.322	0.885	0.848	0.079
Tradition	0.680	0.670	0.794	0.708	0.694	0.601
Self-direction	1.119	1.113	0.760	1.143	1.126	0.658
Stimulation	0.943	1.017	0.044	0.967	1.051	0.020
Hedonism	1.102	1.127	0.589	1.068	1.092	0.526
Security	1.040	1.020	0.232	1.034	1.034	0.912
Big5 Emotional stability	2.843	2.845	0.911	2.822	2.944	0.010
Big5 Extroversion	2.959	2.941	0.799	2.993	2.977	0.643
Big5 Openness	2.883	2.874	0.834	2.908	2.916	0.680
Big5 Agreeableness	3.248	3.199	0.277	3.220	3.214	0.716
Big5 Conscientiousness	2.769	2.789	0.662	2.788	2.767	0.576

Notes: Mean responses by prime and p-values from
non-parametric MWU tests for comparisons between priming conditions

Table 8: Comparing ex ante and ex post responses

	Correlations	Mean values		
		Ex Ante	Ex Post	p-value
Benevolence	0.754	1.095	1.096	0.650
Universalism	0.904	1.136	1.134	1.000
Achievement	0.841	1.003	0.988	0.880
Power	0.804	0.835	0.844	0.404
Conformity	0.809	0.895	0.863	0.003
Tradition	0.758	0.680	0.698	0.081
Self-direction	0.770	1.104	1.134	0.013
Stimulation	0.823	0.986	1.011	0.324
Hedonism	0.811	1.113	1.089	0.001
Security	0.835	1.035	1.029	0.821
Big5 Emotional stability	0.521	2.812	2.881	0.034
Big5 Extroversion	0.624	2.964	2.980	0.319
Big5 Openness	0.747	2.860	2.924	0.000
Big5 Agreeableness	0.599	3.226	3.210	0.382
Big5 Conscientiousness	0.468	2.778	2.780	0.793

Notes: The first column reports pairwise correlations between ex ante and ex post values.
The last three columns present overall average ex ante and ex post responses
along with p-values from a non-parametric Wilcoxon matched pairs test.

Table 9: OLS on all subjects with interaction effects

VARIABLES	(1)	(2)	(3)	(4)
	Dependent variable: Charity contribution			
Prime	-2.032	-2.180	-4.174*	-5.557**
	[2.897]	[2.894]	[2.490]	[2.354]
Universalism	7.086***	6.946***	2.728**	3.037
	[1.477]	[1.466]	[1.246]	[3.171]
Prime#Universalism	2.307	2.477	4.236**	5.333***
	[2.509]	[2.506]	[2.120]	[2.021]
Charity/session fixed effects	NO	YES	YES	YES
Charity controls	NO	NO	YES	YES
Personality controls	NO	NO	NO	YES
Constant	2.602	-1.005	-5.279***	-4.420
	[1.752]	[1.844]	[1.733]	[5.720]
N	286	286	282	282
R-squared	0.074	0.129	0.349	0.410

Notes: Robust standard errors clustered at the subject level, *** p<0.01, ** p<0.05, * p<0.1.

Prime takes value 1 for Uni. Charity/Session includes charity and session fixed effects. Personality controls

for the PVQ and Big 5 items. Charity controls include controls for familiarity with and appreciation for the charity.

A.3   Interaction effects

The main analysis, using the above- and below-median samples of universalism, can be criticized for being arbitrary regarding the selection of the cutoff point (the median in our case). We therefore also conducted a regression analysis in which we introduce interaction effects between the prime and universalism. Table 9 reveals that the interaction effect has the correct sign but is only significant once we control for personality and charity fixed effects.

A.4   Regression analysis using other measures of pro-socialness

In what follows, we reproduce the main analysis but replace the universalism personal value measure used above with a related pro-social personality trait measure, the Big 5 agreeableness trait. We run a regression analysis on those who score above the median in the studied measure of pro-socialness and those who score below the median. Tables 10 and 11 report regression results for subjects above and below the population median of the Big 5 agreeableness measure. Although weaker, the findings here corroborate those using the universalism measure.

Table 10: OLS on subjects with above-median agreeableness

VARIABLES	(1)	(2)	(3)	(4)
	Dependent variable: Charity contribution			
Prime	0.608	0.673	0.935*	1.014**
	[0.589]	[0.590]	[0.517]	[0.509]
Charity/session fixed effects	NO	YES	YES	YES
Charity controls	NO	NO	YES	YES
Personality controls	NO	NO	NO	YES
Constant	10.02***	5.726***	-3.571***	-24.54
	[0.398]	[0.910]	[1.085]	[30.46]
N	199	199	196	196
R-squared	0.003	0.072	0.316	0.384

Notes: Robust standard errors clustered at the subject level, *** p<0.01, ** p<0.05, * p<0.1.

Prime takes value 1 for Uni. Charity/Session includes charity and session fixed effects. Personality controls

for the PVQ and Big 5 items. Charity controls include controls for familiarity with and appreciation for the charity.

Table 11: OLS on subjects with below-median agreeableness

VARIABLES	(1)	(2)	(3)	(4)
	Dependent variable: Charity contribution			
Prime	-0.135	-0.196	-0.606	-0.876
	[1.035]	[1.087]	[0.873]	[0.844]
Charity/session fixed effects	NO	YES	YES	YES
Charity controls	NO	NO	YES	YES
Personality controls	NO	NO	NO	YES
Constant	9.945***	6.602***	-5.026***	7.145
	[0.714]	[1.834]	[1.568]	[38.12]
N	87	87	86	86
R-squared	0.000	0.040	0.383	0.516

Notes: Robust standard errors clustered at the subject level, *** p<0.01, ** p<0.05, * p<0.1.

Prime takes value 1 for Uni. Charity/Session includes charity and session fixed effects. Personality controls

for the PVQ and Big 5 items. Charity controls include controls for familiarity with and appreciation for the charity.

Table 12: OLS on all subjects

VARIABLES	(1)	(2)	(3)	(4)
	Dependent variable: Charity contribution			
Prime	0.309	0.306	0.400	0.365
	[0.528]	[0.522]	[0.447]	[0.418]
#Recognized	0.108	0.150*	0.126*	0.140**
	[0.0788]	[0.0776]	[0.0651]	[0.0637]
Charity/session fixed effects	NO	YES	YES	YES
Charity controls	NO	NO	YES	YES
Personality controls	NO	NO	NO	YES
Constant	9.676***	5.670***	-4.110***	-27.68
	[0.359]	[0.822]	[0.877]	[24.06]
N	303	303	301	281
R-squared	0.006	0.066	0.325	0.408

Notes: Robust standard errors clustered at the subject level, *** p<0.01, ** p<0.05, * p<0.1.

Prime takes value 1 for Uni. Charity/Session includes charity and session fixed effects. Personality controls

for the PVQ and Big 5 items. Charity controls include controls for familiarity with and appreciation for the charity.

A.5 Controlling for the number of recognized words

In Tables 12-14, we report robustness checks by introducing the number of recognized words as a linear control in the regressions reported in the main analysis. In Tables 15-17, we instead exclude any subjects who were able to read one or more of the prime words in the control task.

A.6 Regressions with #Recognized words as dependent variable

Table 22 shows that when regressing the number of recognized prime words on personal values and the priming condition, participants are able to read more prime words in the universalism priming condition. Coefficients in the regressions in Table 23 indicate an interaction effect between the priming condition and the corresponding personal values. However, the effects are not statistically significant.

A.7 Gender and age

We sent out an ex post questionnaire asking about gender and age, but we did not obtain full participation. Hence, there may be sample selection issues that may impact the validity of the conducted analysis. Nevertheless, gender and age are correlated with values and personality measures, which thus capture at

Table 13: OLS on subjects with above-median universalism

VARIABLES	(1)	(2)	(3)	(4)
	Dependent variable: Charity contribution			
Prime	1.224*	1.416*	1.658***	1.587**
	[0.702]	[0.726]	[0.602]	[0.620]
#Recognized	0.0217	0.0398	0.0743	0.0983
	[0.117]	[0.112]	[0.0900]	[0.0873]
Charity/session fixed effects	NO	YES	YES	YES
Charity controls	NO	NO	YES	YES
Personality controls	NO	NO	NO	YES
Constant	10.73***	7.735***	-3.077**	-35.48
	[0.473]	[1.238]	[1.510]	[33.98]
Observations	143	143	142	142
R-squared	0.014	0.076	0.310	0.397

Notes: Robust standard errors clustered at the subject level, *** p<0.01, ** p<0.05, * p<0.1.

Prime takes value 1 for Uni. Charity/Session includes charity and session fixed effects. Personality controls

for the PVQ and Big 5 items. Charity controls include controls for familiarity with and appreciation for the charity.

Table 14: OLS on subjects with below-median universalism

VARIABLES	(1)	(2)	(3)	(4)
	Dependent variable: Charity contribution			
Prime	-0.447	-0.397	-0.476	-0.978*
	[0.757]	[0.772]	[0.649]	[0.530]
#Recognized	0.274***	0.303***	0.198*	0.228**
	[0.102]	[0.110]	[0.102]	[0.0937]
Charity/session fixed effects	NO	YES	YES	YES
Charity controls	NO	NO	YES	YES
Personality controls	NO	NO	NO	YES
Constant	8.657***	4.008***	-4.136***	-2.991
	[0.525]	[0.978]	[1.143]	[33.18]
Observations	140	140	139	139
R-squared	0.022	0.097	0.360	0.486

Notes: Robust standard errors clustered at the subject level, *** p<0.01, ** p<0.05, * p<0.1.

Prime takes value 1 for Uni. Charity/Session includes charity and session fixed effects. Personality controls

for the PVQ and Big 5 items. Charity controls include controls for familiarity with and appreciation for the charity.

Table 15: OLS on all subjects, restricted sample (excluding participants who reported prime words)

VARIABLES	(1)	(2)	(3)	(4)
	Dependent variable: Charity contribution			
Prime	-0.0570	-0.0575	0.222	0.478
	[0.674]	[0.674]	[0.557]	[0.539]
Charity/session fixed effects	NO	YES	YES	YES
Charity controls	NO	NO	YES	YES
Personality controls	NO	NO	NO	YES
Constant	9.926***	6.965***	-3.070**	-61.19*
	[0.408]	[1.072]	[1.202]	[33.81]
N	178	178	177	165
R-squared	0.000	0.056	0.331	0.400

Notes: Robust standard errors clustered at the subject level, *** $p<0.01$, ** $p<0.05$, * $p<0.1$.

Prime takes value 1 for Uni. Charity/Session includes charity and session fixed effects. Personality controls

for the PVQ and Big 5 items. Charity controls include controls for familiarity with and appreciation for the charity.

Table 16: OLS on subjects with above-median universalism using a restricted sample (excluding participants who reported prime words)

VARIABLES	(1)	(2)	(3)	(4)
	Dependent variable: Charity contribution			
Prime	0.572	0.764	1.221*	1.267*
	[0.868]	[0.883]	[0.711]	[0.755]
Charity/session fixed effects	NO	YES	YES	YES
Charity controls	NO	NO	YES	YES
Personality controls	NO	NO	NO	YES
Constant	10.74***	9.514***	-0.993	-59.77
	[0.512]	[1.225]	[1.669]	[47.33]
N	94	94	93	93
R-squared	0.003	0.063	0.280	0.389

Notes: Robust standard errors clustered at the subject level, *** $p<0.01$, ** $p<0.05$, * $p<0.1$.

Prime takes value 1 for Uni. Charity/Session includes charity and session fixed effects. Personality controls

for the PVQ and Big 5 items. Charity controls include controls for familiarity with and appreciation for the charity.

Table 17: OLS on subjects with below-median universalism using a restricted sample (excluding participants who reported prime words)

	(1)	(2)	(3)	(4)
VARIABLES	Dependent variable: Charity contribution			
Prime	-0.474	-0.541	-0.386	-0.747
	[1.038]	[1.073]	[0.900]	[0.751]
Charity/session fixed effects	NO	YES	YES	YES
Charity controls	NO	NO	YES	YES
Personality controls	NO	NO	NO	YES
Constant	8.926***	4.752***	-3.695**	-54.79
	[0.635]	[1.445]	[1.794]	[43.57]
N	72	72	72	72
R-squared	0.002	0.110	0.400	0.548

Notes: Robust standard errors clustered at the subject level, *** $p<0.01$, ** $p<0.05$, * $p<0.1$.

Prime takes value 1 for Uni. Charity/Session includes charity and session fixed effects. Personality controls

for the PVQ and Big 5 items. Charity controls include controls for familiarity with and appreciation for the charity.

Table 18: OLS on #Recognized words

	(1)	(2)	(3)	(4)
VARIABLES	Dependent variable: #Recognized words			
Prime	1.471***	1.423***	1.428***	1.434***
	[0.363]	[0.350]	[0.353]	[0.348]
Charity/session fixed effects	NO	YES	YES	YES
Charity controls	NO	NO	YES	YES
Personality controls	NO	NO	NO	YES
Constant	1.118***	2.161***	1.875**	5.687
	[0.189]	[0.609]	[0.760]	[5.363]
N	303	303	301	281
R-squared	0.052	0.087	0.089	0.151

Notes: Robust standard errors clustered at the subject level, *** $p<0.01$, ** $p<0.05$, * $p<0.1$.

Prime takes value 1 for Uni. Charity/Session includes charity and session fixed effects.

Charity controls include controls for familiarity with and appreciation for the charity.

Personality controls for the PVQ and Big 5 items.

Table 19: OLS on #Recognized words with interactions

VARIABLES	(1)	(2)	(3)	(4)
	Dependent variable: #Recognized words			
Prime	-0.688	-0.460	-0.747	-0.516
	[1.854]	[1.785]	[1.808]	[1.835]
Universalism	-0.0451	0.0158	-0.0203	0.0692
	[0.192]	[0.196]	[0.203]	[0.291]
Prime#Universalism	0.464	0.403	0.467	0.420
	[0.416]	[0.393]	[0.398]	[0.405]
Charity/session fixed effects	NO	YES	YES	YES
Charity controls	NO	NO	YES	YES
Personality controls	NO	NO	NO	YES
Constant	1.346	2.229**	2.228**	6.611
	[0.875]	[1.010]	[1.066]	[5.299]
N	283	283	281	281
R-squared	0.056	0.093	0.096	0.153

Notes: Robust standard errors clustered at the subject level, *** p<0.01, ** p<0.05, * p<0.1.

Prime takes value 1 for Uni. Charity/Session includes charity and session fixed effects.

Charity controls include controls for familiarity with and appreciation for the charity.

Personality controls for the PVQ and Big 5 items.

least some gender- and age-related variation in charitable giving. The following tables repeat our previous regression analysis studying priming effects but now include gender and age controls. Tables 20-22 report the results for the full sample, for the subjects with above-median universalism, and for the subjects with below-median universalism, respectively. In Table 20, using the full sample, women tend to donate more, but this seems to be driven by omitted-variable bias since if personality measures and personal values are not controlled for, the significance disappears and the estimated coefficients fall drastically.

A.8   OLS regressions using the smallest sample

Table 23 reports the results of four regressions using the the smallest sample (n=282) reported in the main paper. The purpose is to show that our main results are not attributable to our sample becoming smaller when we add controls. It is fair to conclude that our results are robust to such restrictions.

Table 20: OLS on all subjects

VARIABLES	(1)	(2)	(3)	(4)
	Dependent variable: Charity contribution			
Prime	0.158	0.264	0.679	0.583
	[0.622]	[0.631]	[0.523]	[0.514]
Female	1.583**	1.479*	0.824	0.373
	[0.788]	[0.790]	[0.667]	[0.634]
Age	-0.0180	-0.0354	-0.0541	-0.0589
	[0.0514]	[0.0537]	[0.0480]	[0.0465]
Charity/session fixed effects	NO	YES	YES	YES
Charity controls	NO	NO	YES	YES
Personality controls	NO	NO	NO	YES
Constant	9.424***	6.944***	-2.445	-38.56
	[1.533]	[1.927]	[1.811]	[27.42]
N	203	203	200	193
R-squared	0.016	0.076	0.335	0.438

Notes: Robust standard errors clustered at the subject level, *** p<0.01, ** p<0.05, * p<0.1.

Prime takes value 1 for Uni. Charity/Session includes charity and session fixed effects. Personality controls

for the PVQ and Big 5 items. Charity controls include controls for familiarity with and appreciation for the charity.

Table 21: OLS on subjects with above-median universalism

VARIABLES	(1)	(2)	(3)	(4)
	Dependent variable: Charity contribution			
Prime	1.156	1.465*	1.781**	1.949***
	[0.788]	[0.833]	[0.688]	[0.729]
Female	1.387	1.647	0.880	0.529
	[1.046]	[1.068]	[0.917]	[0.899]
Age	0.0440	0.0219	-0.0116	-0.00293
	[0.0778]	[0.0791]	[0.0676]	[0.0712]
Charity/session fixed effects	NO	YES	YES	YES
Charity controls	NO	NO	YES	YES
Personality controls	NO	NO	NO	YES
Constant	8.420***	5.980**	-2.874	-31.04
	[2.246]	[2.934]	[2.769]	[38.72]
Observations	109	109	108	108
R-squared	0.028	0.100	0.309	0.410

Notes: Robust standard errors clustered at the subject level, *** p<0.01, ** p<0.05, * p<0.1.

Prime takes value 1 for Uni. Charity/Session includes charity and session fixed effects. Personality controls

for the PVQ and Big 5 items. Charity controls include controls for familiarity with and appreciation for the charity.

Table 22: OLS on subjects with below-median universalism

VARIABLES	(1)	(2)	(3)	(4)
	Dependent variable: Charity contribution			
Prime	-0.994	-0.933	-0.868	-1.127*
	[0.921]	[0.911]	[0.764]	[0.642]
Female	1.258	1.293	0.691	0.148
	[1.160]	[1.160]	[0.932]	[0.787]
Age	-0.104	-0.129*	-0.102	-0.0721
	[0.0637]	[0.0725]	[0.0753]	[0.0552]
Charity/session fixed effects	NO	YES	YES	YES
Charity controls	NO	NO	YES	YES
Personality controls	NO	NO	NO	YES
Constant	11.49***	6.941***	-2.021	9.695
	[2.047]	[2.495]	[2.407]	[40.30]
Observations	87	87	85	85
R-squared	0.036	0.122	0.422	0.547

Notes: Robust standard errors clustered at the subject level, *** p<0.01, ** p<0.05, * p<0.1.

Prime takes value 1 for Uni. Charity/Session includes charity and session fixed effects. Personality controls

for the PVQ and Big 5 items. Charity controls include controls for familiarity with and appreciation for the charity.

Table 23: OLS (restricted sample)

VARIABLES	(1)	(2)	(3)	(4)
	Dependent variable: Charity contribution			
Prime	0.416	0.464	0.547	0.555
	[0.519]	[0.519]	[0.437]	[0.408]
Charity/session fixed effects	NO	YES	YES	YES
Charity controls	NO	NO	YES	YES
Personality controls	NO	NO	NO	YES
Constant	9.977***	5.971***	-4.015***	-24.09
	[0.345]	[0.854]	[0.902]	[24.15]
Observations	282	282	282	282
R-squared	0.001	0.056	0.331	0.403

Notes: Robust standard errors clustered at the subject level, *** p<0.01, ** p<0.05, * p<0.1.

Prime takes value 1 for Uni. Charity/Session includes charity and session fixed effects. Personality controls

for the PVQ and Big 5 items. Charity controls include controls for familiarity with and appreciation for the charity.

Table 24: OLS on subjects with above-median universalism (restricted sample)

VARIABLES	(1)	(2)	(3)	(4)
	Dependent variable: Charity contribution			
Prime	1.279*	1.488**	1.766***	1.767***
	[0.704]	[0.727]	[0.594]	[0.596]
Charity/session fixed effects	NO	YES	YES	YES
Charity controls	NO	NO	YES	YES
Personality controls	NO	NO	NO	YES
Constant	10.70***	7.858***	-2.790*	-30.87
	[0.452]	[1.254]	[1.457]	[34.52]
Observations	142	142	142	142
R-squared	0.015	0.074	0.308	0.394

Notes: Robust standard errors clustered at the subject level, *** p<0.01, ** p<0.05, * p<0.1.

Prime takes value 1 for Uni. Charity/Session includes charity and session fixed effects. Personality controls

for the PVQ and Big 5 items. Charity controls include controls for familiarity with and appreciation for the charity.

Table 25: OLS on subjects with below-median universalism (restricted sample)

VARIABLES	(1)	(2)	(3)	(4)
	Dependent variable: Charity contribution			
Prime	-0.0679	0.0596	-0.248	-0.648
	[0.719]	[0.732]	[0.614]	[0.512]
Charity/session fixed effects	NO	YES	YES	YES
Charity controls	NO	NO	YES	YES
Personality controls	NO	NO	NO	YES
Constant	9.107***	4.341***	-4.126***	-5.035
	[0.513]	[1.015]	[1.185]	[33.29]
Observations	140	140	140	140
R-squared	0.000	0.077	0.353	0.476

Notes: Robust standard errors clustered at the subject level, *** p<0.01, ** p<0.05, * p<0.1.

Prime takes value 1 for Uni. Charity/Session includes charity and session fixed effects. Personality controls

for the PVQ and Big 5 items. Charity controls include controls for familiarity with and appreciation for the charity.

B   Translated instructions

This is an experiment in economic science, welcome. The scientific value of the experiment requires that you and the organizer of the experiment act in line with the instructions given. You will be paid monetary remuneration exactly as explained in the instructions. Hence, we urge you to read through the following instructions carefully.

Please, shut off your mobile phone. Do not speak or cause unnecessary noise.

If you have any questions, please, raise your hand - an instructor will come to you. You can present your question by whispering it to the instructor.

During the next 10 minutes, you will make 10 decisions. Your choices are anonymous - it is impossible to infer the identity of the decision maker from the collected data.

The compensation paid to you at the end of the experiment will depend on the choices you will make. One of the 10 choices you will make will be randomly drawn (each decision has an equal chance of being chosen), and you will be paid according to this choice.

Follow carefully the instructions on the screen.

In each of the ten decisions, you will share 20 euros between yourself and another party. You can increase the share assigned to the other by pressing "k". You can increase the share assigned to you by pressing "j". You will see the provisional sharing both in euro terms and in a histogram on the screen. When the division is to your liking, you can confirm the division by pressing "d".

To start the experiment, write in the "subject-id" field on the screen the first letter of your mother's maiden name (if you do not know the maiden name of your mother, write the first letter of your own surname), the first initial of your father's last name (if you do not know your father's last name, write the initial of your own last name), the last letter of your mother's first name (if you do not know the last name of your mother's first name, write the last initial of your own first name), the last letter of your place of birth (if you do not know the last letter of your place of birth, write the last letter of your current home town), and the last number of your year of birth. Then click "run" → "run non-stop"

At each time, act according to the instructions on the screen.

B.1 Instructions in the original language (Finnish)

Tämä on taloustieteellinen koe, tervetuloa.

Kokeen tieteellinen luotettavuus edellyttää, että sekä sinä että kokeen järjestäjä toimivat annettujen ohjeiden mukaisesti. Kokeesta maksetaan rahallinen korvaus koeosapuolille täsmälleen siten, kuin ohjeissa todetaan. Lue siis seuraavat ohjeet huolellisesti läpi.

Sulje matkapuhelimesi. älä puhu tai aiheuta turhaa ääntä.

Jos sinulla on kysyttä v ä ä, nosta kätesi kokeen valvoja tulee luoksesi. Voit esittä ä mahdolliset kysymyksesi kokeen valvojalle kuiskaten.

Seuraavan 10 minuutin aikana teet 10 valintaa. Valintasi ovat anonyymeja kerätystä datasta ei voida päätellä päätäksentekijän henkilöllisyyttä.

Kokeen lopuksi sinulle mahdollisesti maksettava kompensaatio riippuu tekemistäsi valinnoista. Yksi kymmenestä tekemästäsi valinnasta valitaan satunnaisesti (kullakin päätöksellä on yhtäläinen mahdollisuus tulla valituksi) ja korvaus sinulle ja toiselle osapuolelle maksetaan tämän valitun päätöksesi mukaisesti.

Seuraa tarkoin ruudun keskellä näkyviä ohjeita.

Kussakin kymmenestä päätäksestä jaat 20 euroa itsesi ja toisen osapuolen välillä. Voit lisätä toisen osapuolen osuutta painamalla "k". Voit lisätä omaa osuuttasi painamalla "j". Näet ruudulla vallitsevan jaon sekä euromääräisesti että histogrammiesityksenä. Kun jako on sellainen kuin haluat, vahvistat pä ätöksesi painamalla "d".

Aloittaaksesi kokeen, kirjoita näytöllä näkyvään kohtaan "subject id" äitisi tyttönimen ensimmäinen kirjain (jos et tiedä äitisi tyttönimeä, kirjoita oman sukunimesi ensimmäinen kirjain), isäsi toisen nimen ensimmäinen kirjain (jos et tiedä isasi toista nimeä, kirjoita oman toisen nimesi ensimmäinen kirjain), äitisi etunimen viimeinen kirjain (jos et tiedä äitisi etunimeä, kirjoita oman etunimesi viimeinen kirjain), syntymäpaikkasi viimeinen kirjain (jos et tiedä syntymäpaikkaasi, kirjoita nykyisen asuinpaikkasi viimeinen kirjain) ja syntymävuotesi viimeinen numero. Klikkaa sen jälkeen "run" ? "run non-stop"

Toimi kulloinkin näytöllä näkyvien ohjeiden mukaan.

C Values orientation questionnaire (How much am I like this person?)

The personal pro-social and pro-self value orientations were captured with the Portrait Values Questionnaire (PVQ, Schwartz, 2003; Schwartz, et al., 1999; Schwartz et al., 2001). The PVQ has been widely used in different contexts and shows good psychometric qualities.[23] Specifically, the PVQ presents subjects with brief portrayals of different people, each describing a person's goals, aspirations, or wishes that suggest the importance of a single value type (Schwartz et al., 2001). For example, "It is important to Z to be rich. Z wants to have a lot of money and expensive things." (power) or "E thinks it is important that every person in the world be treated equally. E wants justice for everybody, even for people E doesn't know." (universalism). Statements were presented in random order. A subject rated the portrayals in response to the question "How much like you is this person?" on the following scale "very much like me", "like me", "somewhat like me", "a little like me", "not like me", and "not like me at all". Answers were coded from 6 (very much like me) to 1 (not like me at all), and mean sum scores for the corresponding items per value were calculated.

C.1 PVQ questionnaire

Here, we briefly describe some people. Please read each description and think about how much each person is or is not like you.

HOW MUCH LIKE YOU IS THIS PERSON?

- (6) Very much like me

- (5) Like me

- (4) Somewhat like me

- (3) A little like me

---

[23]Psychometric quality refers to the measurement reliability of a self-report measure in, e.g., psychological research. It is typically estimated with Cronbach's alpha. Typically, tests for psychometric quality include a test of dimensionality or, in other words, tests the clarity with which the questions serving as indicators of underlying constructs map onto the corresponding constructs in factor analytic or multidimensional scaling techniques (e.g., DeVellis, 1991).

- (2) Not like me

- (1) Not like me at all

1. Thinking up new ideas and being creative is important to him. He likes to do things in his own original way.

2. It is important to him to be rich. He wants to have a lot of money and expensive things.

3. He thinks it is important that every person in the world be treated equally. He believes everyone should have equal opportunities in life.

4. It's very important to him to show his abilities. He wants people to admire what he does.

5. It is important to him to live in secure surroundings. He avoids anything that might endanger his safety.

6. He thinks it is important to do lots of different things in life. He always looks for new things to try.

7. He believes that people should do what they're told. He thinks people should follow rules at all times, even when no-one is watching.

8. It is important to him to listen to people who are different from him. Even when he disagrees with them, he still wants to understand them.

9. He thinks it's important not to ask for more than what you have. He believes that people should be satisfied with what they have.

10. He seeks every chance he can to have fun. It is important to him to do things that give him pleasure.

11. It is important to him to make his own decisions about what he does. He likes to be free to plan and to choose his activities for himself.

12. It's very important to him to help the people around him. He wants to care for their well-being.

13. Being very successful is important to him. He likes to impress other people.

14. It is very important to him that his country be safe. He thinks the state must be on watch against threats from within and without.

15. He likes to take risks. He is always looking for adventures.

16. It is important to him always to behave properly. He wants to avoid doing anything people would say is wrong.

17. It is important to him to be in charge and tell others what to do. He wants people to do what he says.

18. it is important to him to be loyal to his friends. He wants to devote himself to people close to him.

19. He strongly believes that people should care for nature. Looking after the environment is important to him.

20. Religious belief is important to him. He tries hard to do what his religion requires.

21. It is important to him that things be organized and clean. He really does not like things to be a mess.

22. He thinks it's important to be interested in things. He likes to be curious and to try to understand all sorts of things.

23. He believes all the worlds' people should live in harmony. Promoting peace among all groups in the world is important to him.

24. He thinks it is important to be ambitious. He wants to show how capable he is.

25. He thinks it is best to do things in traditional ways. It is important to him to keep up the customs he has learned.

26. Enjoying life's pleasures is important to him. He likes to 'spoil' himself.

27. It is important to him to respond to the needs of others. He tries to support those he knows.

28. He believes he should always show respect to his parents and to older people. It is important to him to be obedient.

29. He wants everyone to be treated justly, even people he doesn't know. It is important to him to protect the weak in society.

30. He likes surprises. It is important to him to have an exciting life.

31. He tries hard to avoid getting sick. Staying healthy is very important to him.

32. Getting ahead in life is important to him. He strives to do better than others.

33. Forgiving people who have hurt him is important to him. He tries to see what is good in them and not to hold a grudge.

34. It is important to him to be independent. He likes to rely on himself.

35. Having a stable government is important to him. He is concerned that the social order be protected.

36. It is important to him to be polite to other people all the time. he tries never to disturb or irritate

others.

37. He really wants to enjoy life. Having a good time is very important to him.

38. It is important to him to be humble and modest. He tries not to draw attention to himself.

39. He always wants to be the one who makes the decisions. He likes to be the leader.

40. It is important to him to adapt to nature and to fit into it. He believes that people should not change nature.

Thank you for your cooperation!

C.2   PVQ - Coding key

- Individual Level Conformity - 7,16,28,36

- Tradition - 9,20,25,38

- Benevolence - 12,18,27,33

- Universalism - 3,8,19,23,29,40

- Self-Direction - 1,11,22,34

- Stimulation - 6,15,30

- Hedonism - 10,26,37

- Achievement - 4,13,24,32

- Power - 2,17,39

- Security - 5,14,21,31,35

D   Prime words

D.1   Neutral prime words

pöytä - table; taivas - sky; teksti - text; sisältö - content; käytävä - corridor; todellisuus - reality; tilastokeskus - center of statistics; neutraalisuus - neutrality; kivennäisvesi - mineral water; lumivalkoisuus -

snow-whiteness; tulitikkurasia - match box; haja-asutusalue - sparsely populated area; sivustakatsoja - by-stander; sarjakuvahahmo - cartoon character; kansallismuseo - national museum; monikäyttöisyys - versatility; virastorakennus - public office building; virvoitusjuoma - soft drink; perustuskustannus - basis cost / elementary cost; pituussuuntaisuus - longitudinality

D.2   Universalism prime words

ekologisuus - ecological (the noun of being ecological); vapaus - freedom; pyyteettömyys - altruism; reiluus - fairness; tasa-arvoisuus - equality; yhteinen etu - common good; yhdenvertaisuus - parity; avaramielisyys - openmindedness; suvaitsevaisuus - tolerance; ympäristönsuojelu - environmental protection; oikeudenmukaisuus - justice; viisaus - wisdom; oikeamielisyys - righteousness; ymmärtäväisyys - comprehension; yhteisymmärrys - mutual understanding; laajakatseisuus - broadmindedness; ihmisoikeudet - human rights; rauha - peace; luonto - nature; yhteisöllisyys - communality;

E   Charity organizations

WWF - World Wildlife Fund, Punaisen ristin katastrofirahasto - Red Cross Catastrophe Fund, Pelastakaa lapset - Save the Children, UNHCR - Finnish Refugee Help UNHCR, Lääkärit ilman rajoja - Medecins sans Frontiöres, SOS Lapsikylä - SOS Children's Villages, Kirkon Ulkomaanapu - Foreign Aid of the Finnish Lutheran Church, Lastenklinikan kummit - The Association of Friends of the University Hospital for Children, Mannerheimin lastensuojeluliitto - The Mannerheim League for Child Welfare, Plan - Plan Finland.

F   Pilot studies

Our study is inspired by a recent study by Andersson et al. (2016). They report that in team contests, prosocial individuals provide more effort for the team when primed with self-transcendence-value-laden word scrambles (universalism and benevolence values). The effect of the self-transcendence prime on pro-self-motivated agents (power and achievement values) was the opposite - their effort for the team was reduced. The negative effect was not predicted by the theory proposed in the study, and the authors were puzzled by it.

In this study, we examine a related effect – that of the match between personal value-driven goals and a prime on charitable giving. In our first pilots, we used a word-scramble priming technique, i.e., a supraliminal instead of a subliminal priming technique (Bargh et al. 2001) similar to that used in Andersson et al. (2016). If an effect were found, we would then proceed to study whether subliminal priming could bring about the same effect. Our first pilot study was conducted at the end of January 2011 as a classroom experiment in Norrtälje, Sweden (n=51). We found an effect of word-scramble priming, but a large fraction of subjects understood the purpose of the study (using a standard ex post funneled questionnaire procedure, see, e.g., Bargh et al., 2001) - a feature typically considered to undermine the reliability of a priming study due, for instance, to potential experimenter demand effects (Zizzo, 2010). The reason for the high rate of recognizing the purpose of the prime, we believed, was the fact that the personal values were elicited ex post during the same experimental session and it was easy to recognize that the words in the items of the Schwartz PVQ questionnaire were similar to the prime word items in the scrambles.

Our next pilot was arranged at the experimental laboratory of the Max Planck Institute in Jena, Germany, in April 2011 (n=60). We still used word-scramble priming, but in contrast to the design in Norrtälje, we changed the timing of the personal value elicitation, which was conducted a week before the actual experiment using an internet survey tool, as in our final research design. We conjectured that the temporal separation of the elicitation of values and the priming would allow us to reduce the number of subjects who would understand the purpose of the study. Once again we found results indicating the effectiveness of the prime on charitable giving. Nevertheless, an important fraction of the subjects still understood the purpose of the study (using the standard funneled questionnaire). We again suspected that the words in the items of the ex ante conducted Schwartz PVQ questionnaire were similar to the prime words in the word scramble.

Since the evidence indicated a positive interaction effect between the prime and personal values on charity donations, we decided to proceed with the subliminal priming experiments instead of the word-scramble priming. The advantage of the subliminal priming was that if the subjects in fact were unable to consciously read the words appearing in the subliminal stimuli, they could not possibly consciously associate the prime words with the items of the PVQ questionnaire, and we could thus minimize any demand effects.

The first sessions with a subliminal design were run in Turku, Finland, on the 24th and 25th of January, 2012 (n=57). The design was fairly reminiscent of the main experiment, but (1) there were only 8 charity

donation decisions, (2) we did not use the forward and backward masks in the stimuli, (3) the actual prime word appeared on the screen for 34 milliseconds instead of 17 milliseconds, and (4) we contrasted a self-transcendence prime with a self-enhancement prime in our experimental treatment (In the self-enhancement prime, we used 8 prime words with a power-value association and 8 prime words with an achievement-value association, all words taken directly from the PVQ items.) Prior to each of the 8 charity donation decisions, there were 4 word stimuli, two of which were actual words with connotations and two had letters randomly reshuffled into a non-meaningful combination of letters. Once the charity decisions were made, we asked the subjects to evaluate each of the stimuli again and decide whether an actual word had appeared on the screen, as opposed to a non-meaningful combination of letters, or whether one could not tell. Being able to distinguish words from non-words would be evidence of failure to subliminally prime the subject (typical two-alternative objective threshold task). However, this technique's main disadvantage is that it has low power. Indeed, this deficiency is discussed by Simons et al. (2006), for instance. However, we found that surprisingly many subjects could read the words on the screen.

To further improve the subliminal priming, we therefore pilot-tested various lengths of the stimuli, sizes of the letters, with and without forward and backward masks and with different length between the prime word stimuli and the masks. The purpose was to choose a priming condition in which more than 90 percent of the words could not be recalled/read but the stimuli would nevertheless be just barely "underwater" in the sense that marginal changes to facilitate the reading of the stimuli would undermine subliminity. These modifications brought us to our last pilot experiment, conducted in Turku on 24-25 October and 4 and 11 December, 2012 (n=44). It differed from the present design only in that the benchmark condition used a pro-self priming (with connotations of both power and achievement values) instead of a neutral priming condition without any connotations. For the main experiment, we changed the pro-self priming to a neutral prime, to be able to identify a clean effect of universalism priming without confounding it with the effects of the pro-self prime.

G   Personality questionnaire (Finnish original and some example English translations)

Alla olevien rivien molemmissa päissä on kuvaus vastakkaisista luonteenpiirteistä. Arvioi jokaisen rivin kohdalla, millainen itse olet. Jos toinen kuvauksista sopii sinuun hyvin, valitse sitä lähin vaihtoehto. Jos toinen kuvauksista sopii sinuun jossain määrin, valitsee sitä toiseksi lähin vaihtoehto. Jos molemmissa päissä mainitut piirteet kuvaavat sinua yhtä hyvin, tai jos et osaa päättää, valitse keskimmäinen vaihtoehto. (English translation: "In the two opposite ends of the rows here below, there are decriptions of two opposite kinds of personality characteristics. In each row, evaluate yourself; If one of the descriptions matches you well, choose the option closest to the description. If one of the descriptions matches you to some extent, choose the option second closest to it. If the descriptions on the two ends of the row characterize you equally well, or if you cannot decide, choose the middle option.")

Minä olen ...(English translation: "I am... ")

1. Hermostunut, pelokas, huolestunut (English translation: "Anxious, frightened, nervous)   o o o o o   Rauhallinen, tyyni, levollinen (English translation: "Calm, serene, composed")

2. Ystävällinen, sydämellinen (English translation: "Friendly, cordial)   o o o o o   Kylmä, etäinen, varautunut (English translation: "Cold, distant, reserved")

3. Rikas mielikuvitus, haaveilija   o o o o o   Maanläheinen, käytännöllinen,

4. Luottava, sinisilmäinen   o o o o o   Epäilevä, skeptinen, kyyninen

5. Pystyvä, tehokas, pätevä   o o o o o   Taitamaton, valmistautumaton

6. Tasapainoinen, rent   o o o o o   Kiukkuinen, ärtyisä, vihainen

7. Erakko, ujo, välttää väkijoukkoja   o o o o o   Seurallinen, sosiaalinen

8. Taide ei kiinnosta   o o o o o   Arvostaa taiteita ja kauneutta

9. Juonikas, kavala, viekas   o o o o o   Rehellinen, vilpitön

10. Epäjärjestelmällinen, huolimaton   o o o o o   Järjestelmällinen, huoliteltu

11. Masentunut, surullinen, onneton   o o o o o   Tyytyväinen, toiveikas

12. Itsevarma, dominoiva   o o o o o   Alistuva, jää taka-alalle

13. Tunteet syviä ja monipuolisia   o o o o o   Tunteet eivät kovin tärkeitä

14. Huolehtiva, avulias, antelias   o o o o o   Itsekäs, itsekeskeinen

15. Luotettava, velvollisuudentuntoinen   o o o o o   Epäluotettava, vastuuton

16. Itsevarma, seurassa vapautunut   o o o o o   Vaivaantunut, kiusaantunut

17. Hidastempoinen, verkkainen   o o o o o   Energinen, vauhdikas, aktiivinen

18. Tekee mieluiten totutulla tavalla   o o o o o   Pitää uutuudesta ja vaihtelusta

19. Kilpailuhenkinen, itsepäinen   o o o o o   YYhteistyökykyinen, mukautuva

20. Laiska, päämäärätön Kunnianhimoinen,   o o o o o   työnarkomaani

21. Impulsiivinen, kiusauksille altis   o o o o o   Hyvä itsehillintä

22. Seikkailunhaluinen, uhkarohkea   o o o o o   Välttää jännitystä ja seikkailuja

23. Älyllisesti utelias, kiinnostunut monista asioista   o o o o o   Teoreettiset asiat tylsiä, vain vähän mielenkiinnon kohteita

24. Vaatimaton, nöyrä   o o o o o   Ylimielinen, itserakas

25. Kurinalainen, sinnikäs   o o o o o   Vitkasteleva, helposti luovuttava

26. Rauhallinen, ei hätäänny   o o o o o   HHauras, kriiseissä avuton

27. Vakavamielinen   o o o o o   Iloinen, hilpeä

28. Arvoiltaan perinteinen, ennakkoluuloinen   o o o o o   Vapaamielinen, suvaitsevainen

29. Säälimätön, sydämetön   o o o o o   Myötätuntoinen, ihmisrakas

30. Huolimaton, ajattelematon   o o o o o   Harkitseva, varovainen

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