Personality and Individual Differences 94 (2016) 277–283

Contents lists available at ScienceDirect

Personality and Individual Differences

journal homepage: www.elsevier.com/locate/paid

Donor registration, college major, and prosociality: Differences among students of economics, medicine and psychology

Chantal E.E. van Andel, Joshua M. Tybur *, Paul A.M. Van Lange

Department of Social and Organizational Psychology, VU University Amsterdam, Van der Boechorststraat 1, 1081 BT Amsterdam, The Netherlands

ARTICLE INFO

Article history:
Received 22 September 2015
Received in revised form 20 January 2016
Accepted 22 January 2016
Available online xxxx

ABSTRACT

The demand for organ transplants far exceeds supply. Underlying this shortfall is the fact that some people choose to register as organ donors, whereas many others decide not to. Why do people vary in their attitudes and choices regarding organ donation? We hypothesize that attitudes toward organ donation and decisions to register as a donor are linked to prosociality. We test this hypothesis across two studies, both of which suggest that prosociality is linked to attitudes toward organ donation or actual donor status. Study 1 demonstrates that two groups (economics students and psychology students) that have previously been shown to differ in prosocial orientations have different attitudes toward organ donation and are registered as organ donors at different rates. Study 2 investigated three groups (economics, psychology, and medical students), and it found that messages framing organ donation as a prosocial act affect willingness to become a donor, but only among economics students and among students who score lower on an instrument designed to measure prosociality. Implications and future research directions are offered.

1. Introduction

In most countries, the demand for human organs must be entirely satisfied by voluntary donations, given widespread laws that prohibit trading human organs for sale. Unfortunately for individuals requiring organ transplants, demand for organs exceeds supply. As a few examples, 79,369, 6826, and 15,292 people are waiting for an organ transplant, in the U.S., the UK, and the Eurotransplant region (including the Benelux countries, Germany, Austria, Hungary, Croatia, and Slovenia) respectively (Eurotransplant, 2012; NHSBT, 2014; UNOS, 2014). The difference in the number of available organs is similarly reflected in disparities between people's willingness to receive versus donate organs. In the Netherlands, for example, only 25% of the age eligible population is registered as an organ donor, whereas the majority reports being willing to accept an organ transplant in case of need (CBS, 2012).

Narrowing this gap can save lives, and, consequently, researchers have attempted to uncover the reasons why people resist registering as organ donors. Some of these reasons include distrust in the medical system (Morgan, Stephenson, Harrison, Afifi, & Long, 2008; O'Carroll, Foster, McGeechan, Sandford, & Ferguson, 2011; Parisi & Katz, 1986; Sanner, 1994; Stevens, 1998; Thompson, 1993; Youngner, 1992), fear of having one's organs extracted before death has occurred (Sanner, 1994; Stevens, 1998), a general anxiety that accompanies thoughts of death (Horton & Horton, 1991; Robbins, 1990), a desire to avoid bodily mutilation (Morgan et al., 2008; O'Carroll et al., 2011; Parisi & Katz, 1986; Stevens, 1998), and beliefs that organ transfers violate natural or divine laws (Sanner, 1994). In sum, there are several reasons to *avoid* registering as a donor. So why, then, do people register as a donor at all?

In most organ transplant allocation systems (i.e. non-reciprocal ones), there are no personal benefits to an individual for registering as a donor. At the time organ donation takes place, the donor will be dead and cannot enjoy the benefits that often accompany prosocial behaviors, either instrumental (e.g., status or reputation, Griskevicius, Tybur, & Van Den Bergh, 2010) or phenomenological (e.g., experiences of happiness or satisfaction, Dunn, Aknin, & Norton, 2008). In contrast, the expected benefits to an organ recipient are potentially life-saving. Hence, the registering as an organ donor can be thought of as a *prosocial* act, and important reasons for donating might be rooted in prosocial motivations. In the current manuscript, we replicate and extend previous research showing just this — that attitudes toward organ donation are linked to prosocial motivations. Further, our data suggest that communicating the decision to register as an organ donor as a prosocial act can affect some people's willingness to donate organs — specifically, those individuals with low baseline prosociality.

2. Individual differences in prosociality

Individuals differ in their prosocial tendencies, with some individuals placing more value on their own outcomes, and others placing relatively more value on others' outcomes. This individual difference has be assessed using multiple approaches, including behavior in economic games (e.g., the dictator game, Fischbacher & Gachter, 2010),

* Corresponding author.
E-mail address: j.m.tybur@vu.nl (J.M. Tybur).

http://dx.doi.org/10.1016/j.paid.2016.01.037
0191-8869/

personality scales (e.g., Agreeableness and Honesty–Humility, Ashton, Lee, & De Vries, 2014), choice task paradigms (e.g., social mindfulness, Van Doesum, Van Lange, & Van Lange, 2013), vocational choice (e.g., college major, such as economics versus psychology degrees, Van Lange, Schippers, & Balliet, 2011), and social value orientation (SVO). Here, we especially focus on these latter two approaches: college major and SVO. SVO describes how individuals systematically differ in the degree to which they seek to enhance joint outcomes and equality in outcomes (prosocial orientation) versus seek to enhance their own outcomes in absolute terms (individualist orientation) or comparative terms (competitive orientation) (Van Lange, De Bruin, Otten, & Joireman, 1997). Laboratory research suggests that prosocials differ from individualists and competitors (collectively referred to as "proselfs") in a number of ways. Prosocials, as compared to proselfs, often behave more cooperatively in experimental games (such as prisoner's dilemma, resource dilemma, or public goods dilemmas), display greater trust in others, and tend to engage in less dishonest behavior (Balliet, Parks, & Joireman, 2009; Van Lange, Joireman, Parks, & Van Dijk, 2013). SVO also accounts for prosocial behavior outside of laboratory, in "real life" contexts, with prosocials reporting greater concerns with the goals of other organizational departments than do proselfs (Nauta, De Dreu, & Van Der Vaart, 2002). Prosocials, as compared to proselfs, also have greater awareness of how environmental problems can affect all people, as opposed to how environmental problems can affect themselves (Gärling, Fujii, Gärling, & Jakobsson, 2003). Moreover, prosocials, relative to proselfs, engage in a greater variety of donation acts, and they pursue a greater number of donation goals, especially those that are aimed at helping the poor and the ill (Van Lange, Bekkers, Schuyt, & Van Vugt, 2007). Further, and particularly relevant to the current investigation, a nationwide study of the Dutch population demonstrated that individuals with prosocial orientations are more likely to give consent for postmortem donation of all organs (Bekkers, 2006).

As alluded to above, prosocialilty is a broad concept, and SVO, while having good predictive and concurrent validity as a measure of prosociality, does not necessarily perfectly represent the construct. Further, categorizing individuals as prosocial versus proself with SVO requires the completion of a self-report questionnaire. If prosocial orientations partially shape organ donation, then research or interventions aimed at targeting individuals with different degrees of prosocial orientations might benefit from a more easily observable assessment of prosociality. Recent research implicates one such easily observed variable: college major. Researchers found that university students who chose to study economics versus psychology differ in their prosocial orientations (Van Lange et al., 2011), as indexed by SVO. Among psychology students, prosocials tend to be the largest group, whereas among economics students, individualists tend to be the largest group. This pattern is compatible with research demonstrating that economists appear to behave more self-interestedly (or less cooperatively) than non-economists along a variety of dimensions, including free-riding (Marwell & Ames, 1981), in an ultimatum bargaining game (Carter & Irons, 1990), and in charitable giving (Frank, Gilovich, & Regan, 1993). This difference might exist because less prosocial people choose to enroll in economic majors, though economics training might also cause more self-interested behaviors (Frank et al., 1993). Regardless, a preponderance of evidence suggests that, although college major is not perfectly related to SVO (which itself is an important, though not perfect assessment of prosociality), it is related to a variety of signatures of prosociality.

3. Current research

A key goal of the current manuscript is to investigate whether college major, a variable that is posited to reflect prosociality, is associated with organ donation attitudes and decisions. A student population is especially relevant for research about organ donation, as students are more likely to engage in activities that place them at increased risk for fatal accidents (and, hence, could be postmortem organ donors; Jonah, 1997), and they are considered ideal donors because of their age and health (Horton & Horton, 1991). Finding that students' attitudes toward organ donation differ as a function of major could be useful for two reasons. First, combined with previous work on SVO, such findings would provide converging evidence that organ donation attitudes partially reflect dispositional prosociality. Second, they would suggest that interventions designed to increase donation rates could differentially target groups of current or former students depending on their major. Relatedly, a second goal of the current manuscript is to test whether framing organ donation as a prosocial act versus a proself act can affect attitudes toward organ donation. Communicating organ donation prosocially could especially affect individuals who tend to have less positive attitudes toward organ donation — that is, less prosocial individuals.

3.1. Study 1

In Study 1, we explored whether two student groups – psychology and economics students – differ in organ donation attitudes and registration status. We also aimed to replicate previous research by investigating the relationship between SVO and organ donation attitudes and registration statuses.

3.2. Methods

All data from Studies 1 and 2 were collected after approval from the local ethics board. APA ethical guidelines state that psychologists may dispense of full informed consent procedures under multiple conditions, including when (a) research is not reasonably assumed to create distress or harm, and (b) only anonymous questionnaires are used (see section 8.05 of the APA Ethical Principles of Psychologists and Code of Conduct). Given our studies satisfied both of these requirements, we gathered consent verbally rather than with a written consent form.

3.2.1. Participants

Participants were one hundred forty-three first year students ($M_{age} = 19.77$, $SD = 1.66$) recruited from psychology or economics lectures. The sample consisted of 70 economy students (23 females, $M_{age} = 19.96$, $SD = 1.91$) and 73 psychology students (55 females, $M_{age} = 19.59$, $SD = 1.35$). In the Dutch university where data were collected, psychology classes are available only to students who have selected psychology as a major, and economics classes are available only to students who have selected economics as a major (and, hence, first year psychology and economics classes are not used to satisfy general liberal arts requirements, as is the case in many U.S. universities). One participant (an economics student) was excluded because he/she did not complete the second page of the survey, and three other participants were excluded because they did not complete the organ donation attitude items. In total, less than one third of all participants was registered as an organ donor (30.8%).

3.2.2. Measures

3.2.2.1. Organ donation attitudes. Attitudes toward organ donation were measured with items similar to those standard in this literature (e.g., Siegel, Navarro, Tan, & Hyde, 2014). Participants indicated how uncomfortable/comfortable, negative/positive, terrible/wise, and unfavorable/favorable they view kidney donation on a scale from one to ten. These four items were averaged into a single attitudes composite ($\alpha = 0.92$).

3.2.2.2. Social value orientation. Participants then completed the "slider" measure of social value orientation (Murphy, Ackerman, & Handgraaf,

2011). In contrast with the popular triple dominance version of SVO (Van Lange et al., 1997), which places respondents into categories (i.e., prosocials, individualists, competitors), the slider version provides an interval scale estimate of prosociality, with higher scores corresponding with more prosocial orientations (and, hence, values can "slide" between discrete categories). This measure included six items, each of which describes nine options of point allocation between two individuals: 1) the respondent, and 2) an unspecified "other" person. Point allocations within an individual item might be 100 points to me and 50 points to the unknown other, versus 85 points to me and 85 point to the unknown other, versus seven other options. Slider scores were computed using procedures detailed by Murphy and colleagues (Murphy et al., 2011), with lower scores corresponding with more proself orientations, and higher scores corresponding with more prosocial orientations. We note that one item of the SVO slider measure was accidentally displayed twice, such that participants had to make seven combinations instead of six. We retained only the first of the two redundant items (the two responses were virtually identical across participants, $r = .95$).

3.2.2.3. Demographics. Participants also reported their sex, age, and major, and they indicated whether they are currently registered as an organ donor (see Table 1 for a summary).

3.2.3. Procedure

Participants were invited to complete the anonymous paper–pencil survey at the beginning and during the break of their lecture, and they received a chocolate bar in exchange for their efforts.

3.3. Results

3.3.1. Relationship between major and organ donation attitudes and registration

Psychology students reported being registered as organ donors at a higher rate (39.4%) than economics students (20.3%), $\chi^2(1) = 6.11$, $p = .013$. Psychology students also held more positive attitudes toward posthumous kidney donation as compared to economics students, $t(138) = 2.75$, $p < .01$, ($M_{psy} = 8.35$; $M_{eco} = 7.52$), $d = 0.47$. This effect remained when we controlled for participant sex and age in a linear regression model, $t(136) = 2.06$, $p < .05$, ($M_{psy} = 8.29$; $M_{eco} = 7.59$), $d = 0.39$.

3.3.2. Relationship between SVO and major, organ donation attitudes and registration

Unexpectedly, the correlation between social value orientation and attitudes toward posthumous kidney donation was non-significant, $r = .10$, $p = .243$. Notably, we also failed to detect a difference between economics and psychology students in social value orientation, $t(138) = 0.77$, $p = .10$, though the direction of the effect was in accordance with previous research (Van Lange et al., 2011), with psychology students being more prosocial, $d = .13$. Participants who were registered as organ donors did not differ on SVO from participants who were not registered as organ donors, $t(138) = 1.44$, $p = .15$, though, again the difference between donors and non-donors was in the predicted direction, with donors having higher SVO than non-donors, $d = .27$. See Table 1 for a summary.

3.4. Discussion

Study 1 offered preliminary support for the hypothesis that organ donation attitudes and registration status vary across individuals coming from groups that have different prosocial orientations. Notably, though, we failed to detect the previously observed relationship between college major and SVO (Van Lange et al., 2011). However, given a preponderance of evidence suggesting that economists have lower dispositional prosociality than others (Carter & Irons, 1990; Frank et al., 1993; Marwell & Ames, 1981; Van Lange et al., 2011), we tentatively interpret differences between economics and psychology students as support for the hypothesis that organ donation relates to prosociality. That said, this interpretation is tentative given the lack of an observed relationship between SVO and organ donation, which previous research has observed (Bekkers, 2006). We conducted a second study to further investigate these relationships.

3.5. Study 2

Study 2 was designed for three purposes. First, we aimed to replicate findings from Study 1, which provided tentative support for the hypothesis that attitudes toward organ donation and donor registration are related to prosocial orientations. Second, we extended Study 1 by including an additional sample of students: medical students. Adding this third group of students increases our sample size and thus our statistical power to detect a relationship between dispositional prosociality (as measured using SVO) and organ donation attitudes. Further, although medical students are not expected to differ in prosociality from psychology students, they might have more positive attitudes toward organ donation because they have more knowledge about organ donation, which relates positively to registration status (Horton & Horton, 1991). Third, and critically, Study 2 sought to extend Study 1 and other research suggesting that organ donation relates to prosociality (Bekkers, 2006) by examining how a prosocially-framed *persuasive message* might impact organ donation attitudes.

Broadly speaking, persuasive messages can use various motives to effectively promote prosocial behavior (Van Lange et al., 2013). In particular, two important motives that might be emphasized in messages are: (1) the pursuit of interests that emphasize another person's outcomes versus (2) the pursuit of (often longer-term) self-interest (Chen, Pillutla, & Yao, 2009; Van Lange & Joireman, 2008). For example, one might be persuaded to exercise restraint on energy use – electricity use at home – to serve the collective goal of not depleting commonly shared resources. Or one might simply emphasize the financial benefits for the user by spending less money on electricity (Steg, Bolderdijk, Keizer, & Perlaviciute, 2014). Previous research (Loroz, 2007) suggests that in persuasive social contexts, such as recycling and sexually transmitted disease prevention, negative message frames (e.g. "by not engaging in STD prevention, you run the risk of serious health issues for yourself") may be most persuasive with self-referencing appeals whereas positive frames (e.g. "by engaging in STD prevention, you avoid the risk of creating serious health issues for yourself and other people") work best when benefits to self as well as others are emphasized. Likewise, in the context of organ donation, communication researchers have shown that subtle differences in messages can produce different attitudes toward organ donation. For example, gain-framed messages (e.g. "your pledging to donate can not only help prolong the lives for…"), as compared to loss-framed messages (e.g. "your failure to

Table 1
Means and standard deviations for variables measured in Study 1. Psychology and economics students differed in organ donation attitudes and donation registration (p's < .05).

	N	Age	Percentage female	Social value orientation	Percentage registered	Donation attitudes
Psychology students	71	19.59 (1.37)	76%	24.88 (14.44)	39.4%	8.35 (1.62)
Economics students	69	19.99 (1.91)	32%	23.04 (13.75)	20.3%	7.52 (1.92)

pledge to donate can result in death…"), are more likely to elicit favorable reactions and lower psychological reactance to the subject of organ donation (Reinhart, Marshall, Feeley, & Tutzauer, 2007). Given this, we hypothesized that a prosocially framed message would induce more favorable attitudes toward organ donation as compared to an individualistic framed message. We tested this effect, and we tested whether it differed across individuals with different prosocial orientations as assessed via SVO or college major.

3.6. Methods

3.6.1. Participants

Two hundred and fourteen students completed the survey. Four participants failed to complete the SVO measure, and four others failed to complete the organ donation items. These eight participants were eliminated from analyses. The remaining 206 participants (M_{age} = 20.76 years, SD = 1.78) consisted of 62 medical students (38 female), 70 economics students (27 female) and 74 psychology students (60 females). Approximately half of participants were registered as organ donors (49.0%).

3.6.2. Measures

For Study 2, we used the same measures as in Study 1, that is: a four item scale assessing organ donation attitudes, SVO slider, and questions concerning gender, age, college major and registration status. Please note that the four item scale assessing organ donation attitudes (α = .88) was slightly different from the scale used in Study 1, as Study 2 items concerned general organ donation rather than specifically kidney donation.

3.6.3. Procedure

Participants were students recruited from the same university used in Study 1, but this time from second year classes. Participants were invited to complete an anonymous survey on paper, at the beginning and during the break of a lecture in either a required course for economics majors, a required course for psychology majors, or a required course for medicine majors. The surveys were shuffled randomly in a pile and the research collecting the data (the first author) was not able to identify which participants saw which messages (see below for message details). Hence, random assignment occurred within each type of class. Again, the participants received a chocolate bar after finishing the survey.

3.6.4. Manipulation

Before answering questions about organ donation, half of the participants (n = 104) read a prosocially framed organ donation message: "Individuals have the option to register their choice regarding whether their organs can be *donated* to others after death. In deciding whether or not to register your choice, it is important to consider *others*. By *donating* organs after death, *donors* will help save and transform lives in case *people* are desperately ill" (italics added to emphasize aspects of the message that were intended to communicate prosocial versus individualistic benefits). The other half of the participants (n = 102) read an individualistic framed message: "Individuals have the option to register their choice regarding whether their organs can be *transferred* to others after death. In deciding whether or not to register your choice, it is important to consider *yourself and those close to you*. By *transferring* organs after death, *individuals* will help save and transform your life in case *you or a loved one* is desperately ill."

3.7. Results

We first report tests of the predicted main effects of SVO and college major, and the effects of SVO and major on organ donation attitudes separately. Then, we report tests of the interactions between messaging condition on individuals with different prosocial orientations (i.e., economics versus other students, and different SVOs). All analyses are reported controlling for participant sex and age. We note that none of the conclusions change if participant sex and age are not added to the model. A summary of the findings is presented in Table 2.

3.7.1. Relationship between SVO and major

In contrast with Study 1 – but consistent with past research (Van Lange et al., 2011) – we detected differences in SVO across college majors, $F(2, 201) = 9.30$, $p < .001$. Orthogonal contrasts revealed that, whereas medical students ($M = 30.13$, $SD = 11.49$) and psychology students ($M = 32.33$, $SD = 8.24$) did not differ on SVO, $t(201) = 0.50$, $p = .62$, $d = .10$, economics students ($M = 24.23$, $SD = 12.74$) scored less prosocially than the other two groups, $t(201) = 4.30$, $p < .001$, $d = .72$.

3.7.2. Relationship between SVO and donation attitudes

Consistent with past research (Bekkers, 2006), greater prosocial orientations were associated with more positive attitudes toward organ donation, $r_{sp} = .15$, $p < .05$. Note that the findings of Study 1 revealed small non-significant associations; the present finding complements this pattern, and it is fair to note that the magnitude of the association is modest.

3.7.3. Relationship between major and donation attitudes

Consistent with Study 1, students from different majors had different attitudes toward organ donation, $F(2, 201) = 4.70$, $p < .01$. Orthogonal contrasts revealed that, in contrast with Study 1, attitudes did not vary across economics ($M = 7.31$, $SD = 1.69$) and psychology students ($M = 7.43$, $SD = 1.60$), $t(201) = 0.12$, $p = .90$, $d = 0.03$. Instead, attitudes were more positive among medical students ($M = 8.12$, $SD = 1.51$) than among the other two groups, $t(201) = 3.10$, $p < .01$, $d = 0.45$.

3.7.4. Effects of messaging across prosocials and individualists

We did not observe a main effect of the prosocial versus proself framed message, $F(1, 200) = 2.26$, $p = .13$. However, the interaction between SVO and prosocial versus pro-self-framed message was statistically significant, $F(1, 200) = 5.41$, $p < .05$, meaning that the message had a different effect for individuals with different prosocial tendencies (see Fig. 1). Simple effect tests indicated that, at SVO values corresponding with an individualist orientation (SVO angle estimate = 0), the prosocial message was associated with more positive attitudes than the individualist message, $F(1, 200) = 7.21$, $p < .01$ ($M_{pro\_message}$ = 7.96; $M_{ind\_message} = 6.33$), $d = 1.00$. In contrast, at SVO values corresponding with a prosocial orientation (SVO angle = 37.48), there was no effect of prosocial versus individualistic message, $F(1, 200) = 0.05$, $p = .82$ ($M_{pro\_message} = 7.88$; $M_{ind\_message} = 7.92$), $d = .02$. In effect, the prosocial message appeared to "lift up" low SVO individuals' attitudes toward donation to the level of high SVO individuals.

3.7.5. Effects of messaging across majors

We conducted the same analysis described above, but we operationalized prosocial orientation using major (psychology, medicine, or economics) instead of SVO. The interaction between message condition and major did not reach statistical significance, $F(2, 198) = 1.45$, $p = .24$. Nevertheless, we probed the simple effect to test for a pattern complementary to that observed when prosocial orientation was assessed using SVO. For economics students, message condition had an effect on attitudes, $F(1, 198) = 5.20$, $p < .05$ ($M_{pro\_message} = 7.82$, $SD_{pro\_message} = 1.29$; $M_{ind\_message} = 6.97$, $SD_{ind\_message} = 1.96$), d = .53 (see Fig. 2). For medical and psychology students, though, message had no effect on attitudes, p's > .79. This pattern is conceptually similar to the pattern observed when SVO was used to operationalize prosocial orientation, with the prosocial message having an effect on the less prosocial group.

Table 2
Means and standard deviations for variables measured in Study 2. Medical students had higher registration rates than psychology and economics students (p's < .05). A prosocially framed organ donation message was associated with more positive attitudes toward organ donation for economics students (p < .05), but not for medical or psychology students.

	N	Age	Percentage female	Social value orientation	Percentage registered	Donation attitudes (prosocial framing)	Donation attitudes (individualist framing)
Psychology students	75	21.25 (1.84)	81%	32.33 (8.24)	45.3%	7.45 (1.52)	7.41 (1.71)
Economics students	70	20.49 (1.39)	39%	24.23 (12.74)	43.1%	7.82 (1.05)	6.94 (1.98)
Medical students	65	20.57 (1.95)	60%	30.13 (11.49)	58.2%	8.20 (1.56)	8.04 (1.52)

3.7.6. Participant registration status

A chi-square test indicated no omnibus effect of major on donation status $\chi^2(2) = 4.03$, $p = .13$. When we conducted the two predicted contrasts, we found that medical students (58.2% donors) were more likely to be registered donors than the other two groups $\chi^2(2) = 4.02$, $p < .05$. However, psychology (45.3% donors) and economics students (43.1% donors) were equally likely to be registered as donors, $\chi^2(1) = .00$, $p = .97$. Additionally, participants who were registered as organ donors did not differ on SVO from participants who were not registered as organ donors, $t(202) = .66$, $p = .51$ (though we note that the difference was in the predicted direction, with donors having higher SVO than non-donors, $d = .12$).

3.8. Discussion

As in Study 1, we found that individuals with more prosocial orientations had more positive attitudes toward organ donation. However, the measure of prosocial orientation that related to donation attitudes was different across the studies. In Study 1, prosocial orientations, as indexed by college major, related to organ donation. In Study 2, prosocial orientations, as indexed by SVO, related to attitudes toward organ donation (notably, this latter result replicates results reported in Bekkers, 2006). To the best of our knowledge, Study 2 is the first study to show that a prosocial message regarding organ donation can have a positive effect on organ donation attitudes, though our results suggest that this was the case only among people who are prone to be less prosocial (i.e., lower levels of SVO or economics students). As stated above, the prosocially framed message appeared to lead individuals with lower baseline prosocial tendencies to have attitudes similar to those with higher baseline prosocial tendencies. This was the case when we operationalized prosocial tendencies using SVO or college major. We speculate that this may result from less prosocial individuals intuitively viewing organ donation as less of a prosocial act. Indeed, economics students, as compared to medical students, endorse more transactional views toward organ donation (Inthorn, Wohlke, Schmidt, & Schicktanz, 2014). It is possible that simple messages appealing to prosociality (and its psychological underpinnings, such as empathy or the norm of responsibility) shift this baseline orientation toward the orientation that more prosocial individuals possess.

Finally, registration statuses again differed among college majors, with medical students most often registered. Medical students also held more positive attitudes toward organ donation as compared to the other two student groups, which could provide further evidence for a facilitating role of knowledge on the willingness to become a donor (Horton & Horton, 1991). Research has suggested that thinking about organ donation more frequently reduces anxiety toward the organ donation process (Feeley, 2007), and that educational programs in medical schools have positive effects on the organ donation attitudes of medical students (Garcia et al., 2008).

4. General discussion

4.1. Facilitators versus barriers of choosing to register

People continue to die waiting for organ transplants, largely due to a shortage of registered organ donors. Recent findings suggest that self-benefiting rewards, such as financial compensations for living kidney donations, have little effect on organ donation (Gordon, Patel, Sohn, Hippen, & Sherman, 2015). Thus, prosocial, rather than proself, motives might importantly facilitate organ donation. Such motivations for organ donation might share important similarities with those underlying donations to charity (e.g., "I do/will not use this anymore, so I will give it

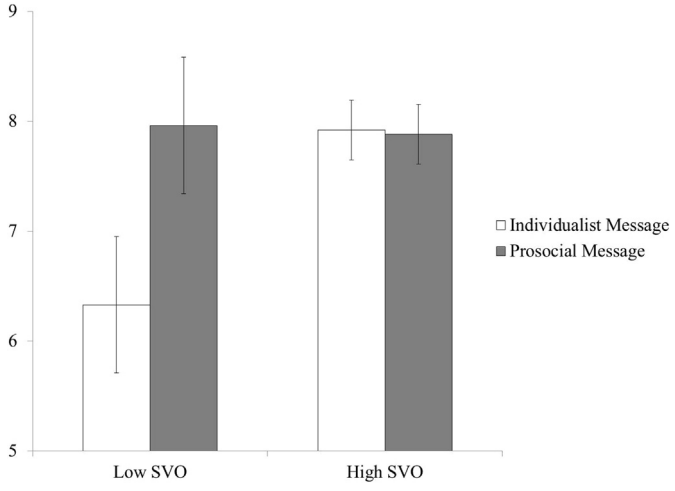

Fig. 1. Means and standard error bars describing organ donation attitudes for individuals with a high (at a value corresponding with a "prosocial" orientation — see Murphy et al., 2011) and low (at a value corresponding with an "individualist" orientation) social value orientation. White bars describe participants who read an individualistically framed message before reporting their organ donation attitudes, and gray bars describe participants who read a prosocially framed message before reporting their organ donation attitudes.

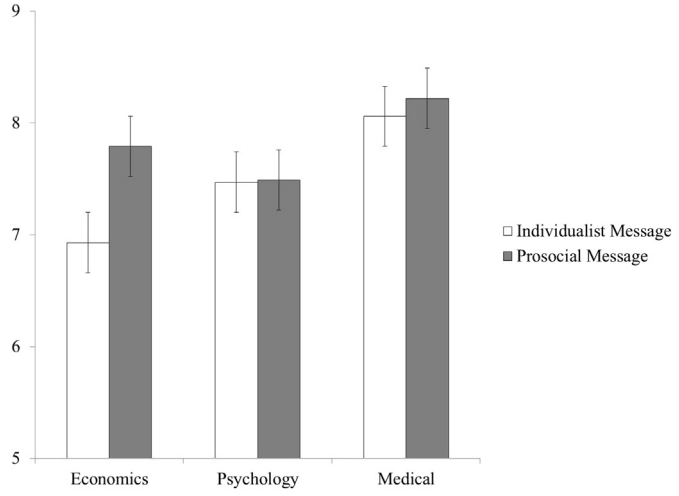

Fig. 2. Means and standard error bars describing organ donation attitudes for students majoring in medicine, psychology, and economics. White bars describe participants who read an individualistically framed message before reporting their organ donation attitudes, and gray bars describe participants who read a prosocially framed message before reporting their organ donation attitudes.

to someone in need"). Indeed, previous research suggests that SVO, one of the markers of prosocial tendencies used here, predicts charitable giving and organ donation registration (Bekkers, 2006); the current research also provides some support for this view, as we observed some association between indicators of prosociality and organ donation attitudes. While related, though, the psychological processes underlying organ donation and charitable giving are likely distinct, partially because of the barriers involved in each behavior. Charitable donations are likely inhibited by feelings of financial insecurity (independent of income) (Wiepking & Breeze, 2012), whereas organ donation is likely inhibited by the distinctly aversive affective experiences accompanying contemplations of death and dismemberment (Horton & Horton, 1991; Robbins, 1990; Sanner, 1994; Stevens, 1998), and perhaps other psychological barriers. Organ donation can therefore be seen as a special class of prosocial behavior, since most other behaviors do not involve these types of barriers. This might help explain why the effect size of the relationship between prosocial orientations and organ donation attitudes might not be as strong as those observed with other prosocial behaviors. That said, signatures of prosocial orientations, such as SVO and college major, still appear to be relevant to organ donation attitudes and behaviors.

Study 1 showed that, compared with psychology students, economic students had less positive attitudes toward organ donation and the lowest donor registration rates. Future research might investigate what causes students from different majors to have different prosocial orientations, and what consequences this has for organ donation across different groups. This question could be relevant for (a) scientific reasons, as university researchers from different disciplines often draw conclusions based on different participant pools (e.g., psychologists versus economists), and (b) societal reasons, as one might argue that some social problems might be better solved by prosocial minds as compared individualistic ones.

Study 2 showed that medical students were more likely than psychology or economics students to be a registered donor. This might be explained by differences in knowledge about the importance or urgency of organ donation (or even active encouragement by teachers or peers), or differences in other types of barriers to organ donation (e.g., death anxiety). Given that we did not measure knowledge or anxiety in these studies, this possibility needs to be explored in future research. Different registration rates across college majors might also be associated with different beliefs across the college groups. Although both medical and psychology students tend to reject financial models for organ donation, economics students, as compared to medical students, may be more likely to be in favor of financial motives and to believe that the value of an organ can be expressed in terms of money (Inthorn et al., 2014).

4.2. Implications for message framing

Study 2 also suggested that exposure to a prosocial message regarding organ donation can positively affect the organ donation attitudes of some individuals — particularly those who are prone to be less prosocial (here, as indexed by college major and SVO). This finding could be used to inform both future interventions and future research designed to increase donation registration rates. Currently, organ donation messages vary markedly in their content, with some messaging strategies emphasizing prosocial aspects of donation (Batson, 2011; De Cremer & Van Lange, 2001), and others emphasizing self-serving or instrumental aspects of donation (Olson, 1965; Van Lange et al., 2013). Study 2 suggests that messages containing sentiments like "give the gift of life" or "offer life and hope to others" might be more effective in increasing consent rates as compared to more proself or transactionally framed messages. Local communities and churches (which, by in large, take a positive stance toward organ donation, Gillman, 1999) could be encouraged to endorse and broadcast these types of prosocial messages, which might be especially effective on their less prosocial members.

Further, recent research (D'Alessandro, Peltier, & Dahl, 2012) shows the potential of prosocially framed messages on donor registration, with a prosocially framed social media campaign deployed by a student organization increasing organ donation registration by 28%. Prosocial norms could be manipulated with low cost interventions — indeed, interventions that are as low cost as the messaging manipulation we used here. Students are potentially ideal targets for low cost interventions that target prosocial motivations, given their high use of virtual social networks. A successful illustration of this is one of Facebook's adaptions in which the platform added an option to voluntarily specify "organ donor" as part of a member's profile. Members were offered a link to their state registry to complete an official designation, and their Facebook friends were made aware of the new status as a donor. On the day of the new initiative, there were 13,012 new online donor registrations across the 44 United States for which data were available. The total number of new registrations over the 13th day study period was 39,818, which was 32,958 more than would have been expected from the baseline registration rate (Cameron et al., 2013).

4.3. Limitations and future directions

Two key aspects of the study limit the generalizability of the findings. First, data were collected within a single university in the Netherlands. Differences between college majors observed here might not generalize to other nations, where psychology, economics, and medical students might have different prosocial dispositions. Second, we observed effects of message framing on attitudes rather than actual behavior. It is unclear how strongly messages would have shaped actual decisions to register as donors. Further, although participants were randomly assigned to condition, we did not measure changes as a function of the message. Future research can address each of these limitations by sampling from different populations, measuring decisions, and measuring changes in attitudes (or donor status) as a function of messaging.

Future research could also uncover which subtle parts of prosocial versus individualistic messages cause the greatest differences in organ donation attitudes (and, hence, are most effective at encouraging donation). Promoting prosocial behavior among those least inclined to act prosocially is an intriguing and challenging task. On the one hand, it seems plausible that messages appealing to self-interest motives would promote donations among the less prosocially inclined. Indeed, self-interest motives, especially when not fully recognized, seem effective in highlighting the financial costs of energy use rather than repeating the message that it is moral or good for the collective to exercise restraint on energy use. On the other hand, some prosocial messages may help reinforce norms or empathy that is needed to give that last push to donating. Indeed, in the medical domain, persuasive messages that appeal to prosocial motives might reinforce norms (e.g. the norm of responsibility, De Cremer & Van Lange, 2001), empathy (Batson, 2011), or both, and therefore promote prosociality in various helping domains — situations in which one can provide support or help to specific others that are in high need. This may be less pronounced in more "abstract" social dilemmas, such as energy conservation, participating in collective action, or contributing to public television (Parks, Joireman, & Van Lange, 2013; Van Lange et al., 2013), where it is less clear how much one's own contributions matter to specific persons or groups. In contrast, prosocial messages might be effective in domains such as organ donation, where the recipient is a living, breathing human being, and where empathy is instrumental in contributing to a collective good.

4.4. Conclusion

In conclusion, the present findings add credence to the broader notion that organ donation needs to be understood in terms of not only personal barriers, such as death anxiety, but also in terms of prosocial motives. The measures used in the present research, social value orientation and college major, have no measurement properties linked to

norms of responsibility or empathy for others in need. However, the present research uncovers that both measures tap broad prosocial motives that matter for organ donation, as do the specific social motives that are highlighted in communications aimed at promoting organ donation among a very challenging group — those who naturally tend to pursue their self-interest.

References

Ashton, M. C., Lee, K., & De Vries, R. E. (2014). The HEXACO Honesty–Humility, Agreeableness, and Emotionality factors: A review of research and theory. *Personality and Social Psychology Review*, *18*, 139–152.

Balliet, D., Parks, C. D., & Joireman, J. (2009). Social value orientation and cooperation in social dilemmas: A meta-analysis. *Group Processes and Intergroup Relations*, *12*, 533–547.

Batson, C. D. (2011). *Altruism in humans.* New York: Oxford University Press.

Bekkers, R. (2006). Traditional and health-related philanthropy: The role of resources and personality. *Journal of Social Psychology Quarterly*, *69*, 349–366.

Cameron, A. M., Massie, A. B., Alexander, C. E., Stewart, B., Montgomery, R. A., Benavides, N. R., ... Segev, D. L. (2013). Social media and organ donor registration: The Facebook effect. *American Journal of Transplantation*, *13*, 2059–2065.

Carter, J., & Irons, M. (1990). Are economists different, and if so, why? *Journal of Economic Perspectives*, *5*, 171–177.

Centraal Bureau voor Statistiek (10 April 2012). *Houdingen ten Aanzien van Orgaandonatie en Orgaanontvangst.* (Available) http://www.cbs.nl/nl-NL/menu/themas/bevolking/publicaties/bevolkingstrends/archief/2012/2012-houdingen-tav-orgaandonatie-bt.htm (Accessed February 2014)

Chen, X. P., Pillutla, M. M., & Yao, X. (2009). Unintended consequences of cooperation inducing and maintaining mechanisms in public goods dilemmas: Sanctions and moral appeals. *Group Processes and Intergroup Relations*, *12*, 241–255.

D'Alessandro, A. M., Peltier, J. W., & Dahl, A. J. (2012). The impact of social, cognitive, and attitudinal dimensions on college students' support for organ donation. *American Journal of Transplantation*, *12*, 152–161.

De Cremer, D., & Van Lange, P. A. M. (2001). Why prosocials exhibit greater cooperation than proselfs: The roles of social responsibility and reciprocity. *European Journal of Personality*, *15*, 5–18.

Dunn, E. W., Aknin, L. B., & Norton, M. I. (2008). Spending money on others promotes happiness. *Journal of Science*, *319*, 1687–1688.

Eurotransplant (31 December 2012). *Statistics on Eurotransplant's service Area.* (Available) https://www.eurotransplant.org/cms/index.php?page=factsheet (Accessed August 2014)

Feeley, T. H. (2007). College students' knowledge, attitudes, and behaviors regarding organ donation: An integrated review of the literature. *Journal of Applied Social Psychology*, *37*, 243–271.

Fischbacher, U., & Gachter, S. (2010). Social preferences, beliefs, and the dynamics of free riding in public goods experiments. *American Economic Review*, *100*, 541–556.

Frank, R. H., Gilovich, T., & Regan, D. T. (1993). Does studying economics inhibit cooperation? *The Journal of Economic Perspectives*, *7*, 159–171.

Garcia, C. D., Barboza, A. P., Goldani, J. C., Neumann, J., Chem, R., Camargo, J., ... Garcia, V. D. (2008). Educaitonal program of organ donation and transplantation at medical school. *Journal of Transplantation Proceedings*, *40*, 1068–1069.

Gärling, T., Fujii, S., Gärling, A., & Jakobsson, C. (2003). Moderating effects of social value orientation on determinants of proenvironmental behavior intention. *Journal ofEnvironmental Psychology*, *23*, 1–9.

Gillman, J. (1999). Religious perspectives on organ donation. *Critical Care Nursing Quarterly*, *22*, 19–29.

Gordon, E. J., Patel, C. H., Sohn, M. -W., Hippen, B., & Sherman, L. A. (2015). Does financial compensation for living kidney donation change willingness to donate? *American Journal of Transplantation*, *15*, 265–273.

Griskevicius, V., Tybur, J. M., & Van Den Bergh, B. (2010). Going green to be seen: Status, reputation, and conspicuous conservation. *Journal of Personality and Social Psychology*, *98*, 392–404.

Horton, R. I., & Horton, P. J. (1991). A model of willingness to become a potential organ donor. *Journal of Social Science and Medicine*, *33*, 1037–1051.

Inthorn, J., Wohlke, S., Schmidt, F., & Schicktanz, S. (2014). Impact of gender and professional education on attitudes towards financial incentives for organ donation: Results of a survey among 755 students of medicine and economics in Germany. *BMC Medical Ethics*, *15*, 15–56.

Jonah, B. A. (1997). Sensation seeking and risky driving: A review and synthesis of the literature. *Journal of Accident Analysis & Prevention*, *29*, 651–665.

Loroz, P. S. (2007). The interaction of message frames and reference points in prosocial persuasive appeals. *Journal of Psychology and Marketing*, *24*, 1001–1023.

Marwell, G., & Ames, R. (1981). "Economists free ride, does anyone else?" Experiments on the Provision of Public Goods, IV. *Journal of Public Economics*, *15*, 295–310.

Morgan, S. E., Stephenson, M. T., Harrison, T. R., Afifi, W. A., & Long, S. D. (2008). Facts versus 'feelings': How rational is the decision to become an organ donor? *Journal of Health Psychology*, *13*, 644–658.

Murphy, R. O., Ackerman, K. A., & Handgraaf, M. J. J. (2011). Measuring social value orientation. *Judgment and Decision Making*, *6*, 771–781.

National Health Service Blood and Transport (NHSBT, 1 (April 2014). *Donation makes a difference.* (Available) https://www.organdonation.nhs.uk/ (Accessed October 2014)

Nauta, A., De Dreu, C. K. W., & Van der Vaart, T. (2002). Social value orientation, organizational goal concerns and interdepartmental problem-solving behavior. *Journal of Organizational Behavior*, *23*, 199–213.

O'Carroll, R. E., Foster, C., McGeechan, G., Sandford, K., & Ferguson, E. (2011). The "Ick" factor, anticipated regret, and willingness to become an organ donor. *Journal of Health Psychology*, *30*, 236–245.

Olson, M. (1965). *The logic of collective action: Public goods and the theory of groups.* London: Harvard University Press.

Parisi, N., & Katz, I. (1986). Attitudes toward postmortem organ donation and commitment to donate. *Journal of Health Psychology*, *5*, 565–580.

Parks, C. D., Joireman, J., & Van Lange, P. A. M. (2013). Cooperation, trust, and antagonism: How public goods are promoted. *Psychological Science in the Public Interest*, *14*, 119–165.

Reinhart, A. M., Marshall, H. M., Feeley, T. H., & Tutzauer, F. (2007). The persuasive effects of message framing in organ donation: The mediating role of psychological reactance. *Journal of Communication Monographs*, *74*, 229–255.

Robbins, R. A. (1990). Signing an organ donor card: Psychological factors. *Journal of Death Studies*, *14*, 219–229.

Sanner, M. A. (1994). Attitudes toward organ donation and transplantation. *Journal of Social Science and Medicine*, *28*, 1141–1152.

Siegel, J. T., Navarro, M. A., Tan, C. N., & Hyde, M. K. (2014). Attitude–behavior consistency, the principle of compatibility, and organ donation: A classic innovation. *Journal of Health Psychology*, *33*, 1084–1091.

Steg, L., Bolderdijk, J. W., Keizer, K., & Perlaviciute, G. (2014). An integrated framework for encouraging pro-environmental behavior: The role of values, situational factors and goals. *Journal of Environmental Psychology*, *38*, 104–115.

Stevens, M. (1998). Factors influencing decisions about donation of the brain for research purposes. *Journal of Age and Aging*, *27*, 623–629.

Thompson, V. L. S. (1993). Educating the African-American community on organ donation. *Journal of the National Medical Association*, *85*, 17–19.

United Network for Organ Sharing (UNOS; 20 October 2014). Transplant Trends (Available): www.unos.org. (Accessed October2014).

Van Doesum, N. J., Van Lange, D. A. W., & Van Lange, P. A. M. (2013). Social mindfulness: Skill and will to navigate the social world. *Journal of Personality and Social Psychology*, *105*, 86–103.

Van Lange, P. A. M., & Joireman, J. (2008). How we can promote behavior that serves all of us in the future. *Social Issues and Policy Review*, *2*, 127–157.

Van Lange, P. A. M., Bekkers, R., Schuyt, T. N. M., & Van Vugt, M. (2007). From games to giving: Social value orientation predicts donations to noble causes. *Journal of Basic and Applied Social Psychology*, *29*, 375–384.

Van Lange, P. A. M., De Bruin, E. M. N., Otten, W., & Joireman, J. A. (1997). Development of prosocial, individualistic, and competitive orientations: Theory and preliminary evidence. *Journal of Personality and Social Psychology*, *73*, 733–746.

Van Lange, P. A. M., Joireman, J., Parks, C. D., & Van Dijk, E. (2013). The psychology of social dilemmas: A review. *Organizational Behavior and Human Decision Processes*, *120*, 125–141.

Van Lange, P. A. M., Schippers, M., & Balliet, D. (2011). Who volunteers in psychology experiments? An empirical review of prosocial motivation in volunteering. *Journal of Personality and Individual Differences*, *51*, 279–284.

Wiepking, P., & Breeze, B. (2012). Feeling poor, acting stingy: The effect of money perceptions on charitable giving. *International Journal of Nonprofit and Voluntary Sector Marketing*, *17*, 13–24.

Youngner, S. J. (1992). Psychological impediments to procurement. *Transplantation Proceedings*, *24*, 2159–2161.