Donating blood and organs: Using an extended Theory of Planned Behavior perspective to identify similarities and differences in individual motivations to donate

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Abstract

Due to the critical shortage and continued need of blood and organ donations, research exploring similarities and differences in the motivational determinants of these behaviors is needed. In a sample of 258 university students, we used a cross-sectional design to test the utility of an extended theory of planned behavior (TPB) including moral norm, self-identity, and in-group altruism (family/close friends, ethnic group), to predict people’s blood and organ donation intentions. Overall, the extended TPB explained 77.0% and 74.6% of variance in blood and organ donation intentions, respectively. In regression analyses, common contributors to intentions across donation contexts were attitude, self-efficacy, and self-identity. Normative influences varied with subjective norm as a significant related to organ donation intentions but not blood donation intentions at the final step of regression analyses. Moral norm did not contribute significantly to blood or organ donation intentions. In-group altruism (family/close friends) was significantly related to organ donation intentions only in regressions. Future donation strategies should increase confidence to donate, foster a perception of self as the type of person who donates blood and/or organs, and address preferences to donate organs to in-group members only.

Keywords: organ donation; blood donation; theory of planned behavior; self-identity; moral norm; in-group altruism
Vital procedures that enhance quality of life or save lives, such as blood transfusions and organ transplantation, rely on community goodwill to donate blood and organs. There is a constant shortage in supply of these valuable resources [1-2] despite generally positive attitudes toward blood donation (BD) and organ donation (OD) [3]. Research suggests that people who donate blood will have the most positive attitudes towards and be the most willing to donate organs upon death [4-8] and potentially engage in other types of medical donation such as tissue [9] or bone marrow [10] donation. It has also been identified that performing one donation behavior (e.g., BD) may potentially increase the likelihood of other donation behaviors (e.g., OD) [11]. Despite evidence supporting this relationship between BD and OD, few studies have gone beyond specifying a relationship or separate examinations of these behaviors to simultaneously examine the motivational determinants of BD and OD willingness/intentions and behavior [3,12-15]. Simultaneous studies of BD and OD decision-making, particularly using established social-cognitive models, are essential to not only continue to improve understanding of the factors that motivate individual choices to donate, but also to identify similarities (or potential differences) in people’s motivations for donation that can be used to inform cost-effective targeted strategies encouraging donation behaviors overall [13].

Blood donation and posthumous (upon death) OD in Australia and other westernized countries share common features. Both behaviors involve giving bodily tissue/organs that are in short supply without external reward such as financial incentives, both involve donation to a recipient who is unknown to the donor, and both can save or improve the quality of life of the recipient. Differences also exist between these two donation behaviors. For example, BD occurs while the donor is living and OD occurs when the donor is deceased [14], blood is a resource that can be regenerated within the body whereas whole organs cannot be regenerated [16], and blood can be donated on multiple occasions whereas organs can be donated only once [8].
It is likely also that people have similar and different motivations for BD and OD. For instance, the lack of external rewards and donating to a stranger suggest that BD and OD may be motivated by an altruistic desire to help others [17-19] and the potential for BD and OD to save or improve lives can feed into the individual’s sense of donation as the ‘right’ thing to do (i.e. moral norm) [19-21]. The fact that OD occurs when the donor is dead and BD occurs when the donor is living may invoke different motivations. For example, some people who wish to donate are motivated by their belief that their organs are no longer needed [17]; yet this motivation is not cited for BD. Both types of donation can be motivated by the development of a donor-identity [22-23] yet the formation and importance of this identity in decision-making varies based on the frequency with which each behavior can occur and it is especially critical for the continued performance of BD [23].

Prior separate studies of BD and OD suggest further similarities in motivational determinants such as increased positive attitudes [15], normative support for donation [24], and a sense of efficacy (or lack thereof) [3] all contributing to donation decisions. Barriers preventing (e.g., ineligibility, fear of medical procedures, distrust of the medical system) [13] and facilitators encouraging (e.g., personal stories of recipients, saving or improving quality of life) [25-26] BD and OD may also be similar. To test the possibility of people’s similar motivational determinants across donation contexts, and to enable comparison with previous separate BD [20,23] and OD [21-22] studies, we use a Theory of Planned Behavior (TPB) [27] approach in the current study.

The Theory of Planned Behavior

The TPB proposes a person’s intentions (readiness to act) as the most proximal determinant of his or her behavior. Intentions are informed by a person’s attitude (positive or negative evaluation of behavior), subjective norm (perceptions of social pressure or approval for behavior), and perceived behavioral control (PBC; perceived ease or difficulty of and confidence
to perform behavior; also thought to predict behavior directly) [27-28]. For BD and OD, people who have more positive attitudes toward donation, perceive that people in their social network support their decision to donate, and believe donating is relatively easy to do, would be expected to have greater intentions to donate [20,22-23]. Prior tests of the utility of the TPB in donation contexts generally support the tenants of the model. In this regard there have been a number of separate tests of the TPB in BD research (for a review see [23]) and relatively few for OD [29] (see e.g., [21-22,29-30] for exceptions); however, we were not able to identify any studies that provided a simultaneous test of the motivations for BD and OD from a TPB perspective. Meta-analytic evidence [31] shows that across a range of behaviors the TPB explains approximately 39% of the variance in intentions and 27% of the variance in behavior. Given that the TPB explains less than half the variance on average in behavioral intentions, Ajzen [27] proposed inclusion of additional variables in the model if there is strong theoretical justification for doing so and if the proposed variables improve the capacity of the TPB to predict intentions and/or behavior.

**Extended TPB: Moral Norm, Self-Identity, and In-group Altruism**

In both BD and OD contexts, additions to the TPB have included moral norm (a person’s feelings of responsibility to donate [20,32]), and self-identity (a person’s concept of his or her self as the type of person who donates blood or organs) [8,22]. For example, Armitage and Conner (Study 2) [20] found that, in addition to the TPB variables, moral norm and self-identity explained 3% of variance in people’s intentions and both constructs were related significantly to BD intentions. For OD, Hyde and White [22] found that moral norm and self-identity explained a further 5% of registered organ donors’ intentions, and an additional 24% of unregistered organ donors’ intentions, over and above the TPB constructs. These values are consistent with meta-analyses citing strong and significant additional variance explained by moral norm (3%, [33]) and
self-identity (6%, [34]) in behavioral intentions, when TPB variables are controlled for. Further, the contribution of moral norm and self-identity may vary depending upon the population, prior experience, and behavior studied. For example, Rise and colleagues [34] found that moral norm may be activated more strongly in older populations or for behaviors that impact greatly on the well-being of others. When behaviors become more important to one’s self-concept, the contribution of other factors (e.g., social influences) to decision-making may diminish in importance. For instance, when people have donated blood previously (particularly on multiple occasions), self-identity may be more integral to forming future intentions to donate [23,35] and the importance of other factors, such as attitudes, reduce [36]. An extended TPB exploring the associations between moral norm, self-identity, and people’s overall OD intentions has yet to be tested.

More recently, research has considered the recipient of donation as associated with BD and OD decisions [e.g., 37,38]. Specifically, research suggests that people vary in their willingness to donate tissue and organs to recipients; those who are very willing to donate to family members/relatives but may be less willing to donate to unknown recipients [14]. While the reasons underlying concerns about recipients are not the focus of this study (see [37,39-41]), one way to represent this preference for a recipient is to examine an individual’s willingness to donate to members of their in-group. In-group altruism refers to a person’s willingness to behave altruistically towards members of his or her own in-group, as compared to an out-group [42] and may be based on, among other factors, socio-demographic characteristics (e.g., ethnicity or age; [43-44]), preference to donate to known others (e.g., family/friends [17]), or value-judgments about deservingness of the donation due to past actions (e.g., smoking history; [40]). Regarding ethnicity, the willingness for preferential donation may stem from cultural meanings attributed to blood or organs that result in less favorable perceptions or willingness to donate to strangers
outside the immediate family network (e.g., [45]) or increased preferences for donating to members who share a similar background (e.g., [43,46]).

Amponsah-Afuwape and colleagues [42] examined in-group as a function of ethnicity and found that Asian and Black participants scored higher on in-group altruism than White participants, and that in-group altruism had a significant negative relationship with BD intention; however, in-group altruism was not a significant predictor in regressions of intention when included within the TPB. For preferences to donate to known others, Hyde and White [17] in their qualitative study found that, if given a choice, participants preferred to donate to a partner, family member, or close friend. Also, Skowronski [38] found that willingness for BD was generally consistent regardless of the recipient but that willingness for OD depended on the relationship between the donor and recipient; participants were more willing to donate organs to a known recipient such as a family member. Given prior research showing individual preferences to donate to known recipients, particularly family members which function as an ‘in-group’, and the findings of Amponsah-Afuwape et al.’s [42] study suggesting a potential relationship between in-group altruism on the basis of ethnic background and BD intentions, we aimed to provide further empirical tests of this construct by including in-group altruism (family/close friend and ethnic group) as part of the extended TPB in the current study.

The Current Study and Hypotheses

We used an extended TPB incorporating moral norm, self-identity, and in-group altruism to identify similarities and differences in motivational determinants of BD and OD intentions. While our focus on intentions is not ideal and no conclusions can or should be drawn regarding causality, intentions have a strong relationship with behavior in donation contexts [47-48]. Further, although BD behavior can be measured and we have included a measure of past BD to
strengthen confidence in the findings, it is not feasible to measure OD behavior prospectively. In line with TPB specifications and prior BD and OD research we hypothesized that:

1. After controlling for age, sex, ethnicity, and past blood donation behavior, people who have more positive attitudes for donation, perceive more normative pressure/support for donation, and have greater confidence in their ability to donate will have increased donation intentions.

2. Over and above the contribution of the TPB predictors and control variables, people who perceive a stronger moral responsibility to donate, believe donation is consistent with and important to their self-concept (self-identity), and have less of a preference to donate to members from their in-group (family/close friends or ethnic group) evidenced by lower in-group altruism scores, will have greater donation intentions.

3a. People who have donated blood previously will have lower in-group altruism scores compared to those who have not donated blood.

3b. People who have registered their OD decision will have lower in-group altruism scores compared to those who have not registered.

4. People who have donated blood previously will have higher OD intention scores compared to those who have not donated blood previously.

Method

Participants and Procedure

Participants were students from an Australian university (n = 258) aged 17 to 57 years (M = 21.86 years; SD = 6.90). Most participants were Caucasian (88%), female (81.3%), and had not donated blood previously (79.3%) or documented their OD decision on a donor register (75.0%) or notified family (53.8%). Participants self-reported their ineligibility to donate blood (n = 47) and organs (n = 20). After ethics approval from the University, students volunteered via the
undergraduate psychology research experience program to complete either a paper-based format or online questionnaire containing items assessing the key constructs of the study.

**Measures**

Items assessing each of the standard TPB constructs of intention, attitude, subjective norm, and PBC (reflecting efficacy to maintain consistency with prior donation research [3,22,49]) [27], as well as the extended TPB constructs of moral norm [20], self-identity [20], and in-group altruism [42] were measured on 7-point response scales (scored 0 to 6) and coded so that higher values reflected higher levels on the variable. Participants self-reported their age in years, sex (coded 1 *male*, 2 *female*), ethnicity (coded 1 *Caucasian*, 2 *non Caucasian*), and prior blood donation (scored 1 *yes*, 2 *no*) also. Separate sets of items measured the standard and extended TPB variables informing BD and OD decisions. Items for each measure (e.g., attitude) related to each donation behavior (e.g., blood donation) were averaged to create reliable scales. Table 1 presents the standard and extended TPB measures used in the current study and corresponding scale reliabilities, means and standard deviations.

[Table 1]

**Data Analysis Strategy**

Initially, we examined correlations between the predictors and dependent variable for each behavior and the correlation between BD and OD intentions. We conducted separate hierarchical multiple regressions to identify similarities and differences in predictors of BD and OD intentions. In each regression we entered the control variables of age, sex, ethnicity, and past blood donation in Step 1, the standard TPB predictors (attitude, subjective norm, and efficacy) in Step 2 (H1), and the extended TPB predictors (moral norm, self-identity, and in-group altruism) in Step 3 (H2). We used the procedure outlined in Howell [50] to compare the strength of the unstandardized beta weights predicting BD and OD intentions. We used Analysis of Covariance
(ANCOVA) to compare those who had and had donated blood previously (H3a) and those who had and had not registered donation wishes (H3b) on their in-group altruism scores. We used an independent groups t-test to compare the mean difference on OD intentions between those who had and had not donated blood previously (H4).

Results

Descriptive Analyses

Participants indicating they were ineligible for BD and OD (see Participants section) were removed from each respective sample for regressions. A total sample of 211 for BD and 238 for OD analyses remained, although participant numbers varied in analyses due to some participants not completing demographic details. The correlation between BD and OD intentions was examined to ensure participants viewed BD and OD as separate behaviors [6] and showed that although positively and significantly correlated, BD and OD intentions were not identical, \( r(197) = .37, p < .001 \).

Table 2 presents bivariate correlations between the standard TPB variables, additional variables and intention for each behavior. The standard TPB predictors were correlated significantly with BD and OD intentions. Significant correlations were demonstrated between moral norm, self-identity, and the standard TPB variables for each donation behavior. The in-group altruism items (family/close friends and ethnic group) were positively and significantly correlated with each other for each donation behavior. In-group altruism (family/close friend) was significantly and negatively correlated with all other predictors and intention for each behavior, suggesting lower in-group altruism scores were associated with higher donation intentions and higher attitude, subjective norm, efficacy, moral norm, and self-identity scores. In-group altruism (ethnic group) showed the same pattern of correlations except it was not
correlated significantly with subjective norm, moral norm, or self-identity for either donation behavior.

[Table 2]

Hierarchical Multiple Regressions Predicting Blood and Organ Donation Intentions

After controlling for age, sex, ethnicity, and past blood donation behavior (Step 1), the linear combination of attitude, subjective norm, and PBC (Step 2) explained 63.4% of variance in BD intention and 61.6% of variance in OD intention. Attitude, subjective norm, and PBC were significant predictors of BD and OD intentions supporting H1. Entry of moral norm, self-identity, and in-group altruism (Step 3) improved significantly prediction of BD ($\Delta R^2 = .03$) and OD ($\Delta R^2 = .03$) intentions; H2 was partially supported with self-identity (but not moral norm) as a significant predictor of BD and OD intentions and in-group altruism (family/friend) a significant predictor of OD intentions. Overall, the extended TPB explained 77.0% (Adj. $R^2 = .76$) of variance in BD intentions with attitude, PBC, and self-identity as significant predictors of intention at the final step. For OD intentions, the extended TPB explained 74.6% (Adj. $R^2 = .73$) of variance with attitude, subjective norm, PBC, self-identity, and in-group altruism as significant predictors at the final step (Table 3). Comparison of the standardized beta weights for the significant predictors of BD and OD intentions [42] revealed no significant differences in the strength of beta weights.

[Table 3]

Mean Differences in In-group Altruism and Intention

Preliminary analyses evaluating the homogeneity-of-slopes assumption indicated that the relationship between ethnic group (covariate) and in-group altruism (either family/friend or ethnic group) did not differ significantly as a function of prior donation behavior (either blood or donor registration depending on analyses). The subsequent One-way ANCOVAs again
controlling for ethnic group (Caucasian or non-Caucasian) as a covariate (Table 4) suggested that blood donors had significantly lower in-group altruism scores for family/close friends than non-donors; however, there was no significant difference on in-group altruism scores for ethnic group, providing only partial support for H3a. Similarly, One-way ANCOVAs showed that participants who had registered their OD wishes had lower in-group altruism scores for family/close friends than those who had not registered, but there was no difference for in-group altruism scores for ethnic group, partially supporting H3b. Based on prior research suggesting blood donors are more willing to donate organs, we used an independent groups t-test to examine differences in mean OD intention scores between those who had and had not previously donated blood (Table 4). Blood donors had stronger OD intentions than non-donors, supporting H4.

Discussion

Our primary aim in this study was to extend on prior research providing separate studies of BD and OD by examining simultaneously the motivational determinants of BD and OD intentions using an extended TPB framework. This approach allowed us to identify similarities (and potential differences) in the contributing factors within the constraints of a cross-sectional design. The extended TPB framework included moral norm and self-identity as well as in-group altruism represented in this study by preferential donation to recipients who are known to the donor (family/close friends) and a part of the donor’s ethnic group. Also we examined whether blood donors may have stronger intentions to donate organs compared to non-donors. Overall, in regressions, the extended TPB explained 77.0% of variance in people’s BD intentions and 74.6% of variance in OD intentions.

In accordance with previous research, attitudes and self-efficacy were consistently related to intentions across donation domains [3] suggesting that both positive attitudes and a perception
of confidence in one’s capacity to donate informed decision-making. Normative variables, however, were inconsistent. Moral norm was not significantly related to BD or OD intentions, and subjective norm was significantly related to OD but not BD intentions. The finding that moral norm and subjective norm were not significantly associated with BD intentions is not unprecedented. In their review of BD research, Masser et al. [23] noted that subjective norm contributed to intentions in some studies [36,51] but not others [20,32]. Moral norm has also been shown to be directly associated with BD intentions in some studies [e.g., 20] but indirectly associated with intentions via attitudes in others [e.g., 52].

The finding that moral norm was not significantly related to OD intentions is in contrast to several studies which have found moral norm to be associated with intentions to join a donor register or talk with family [21-22]. This difference may have occurred because moral norm has been tested in relation to communicating OD wishes rather than OD generally. People may feel a moral obligation to tell important others about their OD wishes whereas donating organs in general to unknown recipients may not invoke feelings of moral obligation. Instead, people may feel a responsibility to donate to members of their in-group (e.g., family member) [14] as evidenced by in-group altruism for family/close friends contributing to OD but not BD decisions in regressions. This finding, however, requires replication in future research.

Consistent with previous BD and OD studies [20,22], self-identity was significantly related to intentions in both donation contexts. Respondents who had a stronger self-concept as the type of person who would donate blood or organs reported greater donation intentions. This finding of self-identity as being relevant to both donation contexts is important because it implies that, in the case of OD, frequent repetition of donation behavior is not a prerequisite for developing an organ donor identity [8]. A person’s belief that he or she is the type of person who would donate his or her organs may potentially be informed by other donation behaviors, such as
Donating blood and organs

BD [8, 11], and reinforced by behaviors such as communicating donation wishes. In the current study, people who had donated blood previously had greater OD intentions, indicating blood donors may be a useful target population to serve as potential organ donors; however, it is still unclear how an organ donor identity develops and future research should seek to understand the mechanisms informing this development.

In partial support of the hypothesis that respondents scoring lower on in-group altruism would be the most likely to intend to donate, in-group altruism for family/close friends (not ethnic group) was significantly associated with OD intentions in regressions, but not BD intentions. Upon examination of the means, however, those who had donated blood previously had lower in-group altruism scores for family/close friends compared to non-donors. In this respect, the findings are consistent with Amponsah-Afuwape et al. [42] who similarly found that blood donors had lower in-group altruism scores compared to non-donors but in-group altruism did not predict BD intention. Building on this finding, results of the current study showed that people who had registered their OD wishes had lower in-group altruism scores for family/close friends (not ethnic group) than those who had not and that in-group altruism for family/close friends was significantly associated with OD intentions in regressions. In-group altruism based on ethnicity was not significantly associated with BD or OD intentions in regressions and scores on this item did not differ significantly based on prior BD or OD registration. Two possible explanations for these findings can be offered.

First, according to previous BD literature the mechanisms underlying BD for donors and non-donors differ [23-24]. Thus, we might expect that in-group altruism would inform decision-making more so for people who have not donated blood previously as this population is more dependent on external cues (e.g., a disaster, being asked to donate by a friend or blood service representative, a family member needing a transfusion) [25,51] for motivation. This explanation
supports the finding of higher scores for in-group altruism among the non-donor population in both the current study and Amponsah-Afuwape et al.’s [42] research. Also, potential organ donors are unlikely to have had prior experience donating organs and, therefore, their decision making is similarly likely to be informed by external cues. Future research could test blood donor and non-donor samples separately to increase understanding of the relationship between in-group altruism and BD decision-making; an approach we could not undertake given low numbers of donors which precluded separate regressions for donor and non-donor samples.

Another possible explanation can be derived from prior studies suggesting that helping behavior may be dependent upon the closeness of relationships such that helping increases in correspondence with increased relationship closeness [e.g., 53]. Consistent with the findings of the current study, Skowronski [38] found that, in general, people appear willing to donate blood regardless of the recipient; however, willingness for OD increased for close others compared to strangers. In addition to level of helping, actual motivations for helping may also differ based on relationship closeness. For instance, helping close others (e.g., family) may derive from altruistic motivations whereas helping in more distant relationships (e.g., strangers) may be associated with egoistic motivations (e.g., reducing negative affect) [54]. For example, Maner and Gailliot [54] showed that after controlling for the effects of egoistic motivation, empathic concern was associated with willingness to help a family member but not a stranger. Also, motivations in these particular donation contexts may change based on the cost to the individual; greater willingness to consider ‘costly’ behavior may be evident for others in an immediate network (e.g., family) as opposed to a broader network (e.g., ethnicity). Specifically, for some people, OD involves a greater cost (e.g., contemplating one’s own death, fear of being declared dead prematurely for the purposes of organ removal, desire to keep the body intact upon death) [55]
and is more intrusive than BD. In this case, donating organs may only be considered for a
preferred recipient such as a family member [38,56].

The challenge for future researchers is to encourage people who endorse preferential
donation to re-categorize their in-group to include a wider range of ‘acceptable’ recipients or to
redefine their in-group at a broader level of categorization to potentially include colleagues,
neighbors, community members, or even fellow national citizens (e.g., as part of a national pro-
donation campaign). For example, Levine and Thompson [57] showed that when different
national identities were made salient, participants were more or less likely to offer financial
assistance to victims of a disaster. A complimentary approach may be to focus on enhancing the
perceived favorability of organ recipients and, particularly, to increase perceptions of similarity
between potential donors and organ recipients [58]. Studies based in social psychological
research provide evidence that behaviors that benefit others increase along with actual or
perceived similarity to the recipient [59] or a shared understanding of the circumstances
experienced by the recipient [60].

Despite its strengths such as a well-established theoretical framework and novelty in
providing a simultaneous evaluation of both BD and OD decision-making, results of this study
should be interpreted with caution. The findings derive from a sample of predominantly
Caucasian, female, younger, university students who had not previously donated blood and
therefore may not generalize to the wider community. While we attempted to control for the
effects of past BD, sex, and age (and these variables were not significant predictors of intention),
there may be differences based on sex, age, ethnicity, or donor status [13] that the current study
could not identify due to the sample recruited. A further limitation of this study was the absence
of a prospective measure of BD and OD behavior and the cross-sectional nature of the research
which prevents inferences about causality. While it is not feasible to obtain a measure of actual
OD behavior, and intentions have been shown to be strong predictors of behavior in donation contexts [47-48], future research should measure BD behavior to test the proposed intention-behavior relationship. A final limitation relates to the possibility that other factors, such as affective reactions [61], may in part explain the contribution of in-group altruism or attitudes to BD and OD. Future research testing if affective reactions, as well as the extended TPB factors, mediate the relationship between past behavior and future intentions may be beneficial.

The current study offers several avenues that may encourage BD and OD. These avenues include the use of strategies that focus on increasing perceptions of efficacy and confidence for BD and OD and fostering people’s perceptions of themselves as the type of person who donates his or her blood and organs are critical (see also [3]). In particular, the suggestion in prior research that blood donors are more likely to consider OD was supported in the current study, indicating that blood donors should continue to be a target population for OD recruitment. The use of in-group altruism presents a challenge for strategy development. Importantly, it highlights that, especially in the OD context, people do have preferences to donate to a recipient who is part of their in-group [56]; in this study, family/close friends rather than ethnic group. A continued focus on identifying similarities and differences in predictors of BD and OD decision-making will assist in efforts to encourage the donation of blood and organs which are essential for increasing quality of life or saving the lives of those recipients waiting to benefit from another’s generosity.
References


Table 1

<table>
<thead>
<tr>
<th>Construct and # Items</th>
<th>Range</th>
<th>M (SD)</th>
<th>Example Item</th>
<th>Cronbach’s α</th>
<th>Items derived from</th>
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</table>
| **Intention** 5       | 0 to 6| Blood: 3.95 (1.82)  
                        Organ: 4.11 (1.79) | “I intend to donate my blood [organs] in the future?”, scored 0 definitely do not to 6 definitely do  
 `α_{blood} = .97`  
 `α_{organ} = .97` | | Armitage & Conner, 2001 |
| **Attitude** 6        | 0 to 6| Blood: 1.15 (1.25)  
                        Organ: 2.00 (1.28) | For me to donate my blood [organs] in the future would be: bad-good, harmful-beneficial  
 `α_{blood} = .85`  
 `α_{organ} = .87` | | Armitage & Conner, 2001 |
| **Subjective norm** 3 | 0 to 6| Blood: 3.46 (1.12)  
                        Organ: 3.24 (1.33) | “People who are important to me think I: 0 should not donate blood [organs] to 6 should donate organs [blood].”  
 `α_{blood} = .82`  
 `α_{organ} = .79` | | Armitage & Conner, 2001 |
| **Self-efficacy** 3   | 0 to 6| Blood: 4.31 (1.75)  
                        Organ: 4.57 (1.58) | How confident are you that you will be able to donate your blood [organs] in the future?” scored 0 not very confident to 6 very confident  
 `α_{blood} = .94`  
 `α_{organ} = .93` | | Armitage & Conner, 2001 |
| **Moral norm** 3      | 0 to 6| Blood: 2.73 (1.66)  
                        Organ: 2.78 (1.73) | “It would go against my principles if I did not donate my blood [organs] in the future”, scored 0 strongly disagree to 6 strongly agree  
 `α_{blood} = .87`  
 `α_{organ} = .88` | | Armitage & Conner, 2001 |
| **Self-identity** 8   | 0 to 6| Blood: 3.17 (0.91)  
                        Organ: 3.28 (1.02) | “Blood [organ] donation is an important part of who I am”, scored 0 strongly disagree to 6 strongly agree  
 `α_{blood} = .66`  
 `α_{organ} = .71` | | Armitage & Conner, 2001 |
| **In-group altruism** 2 | 0 to 6| Blood (Family/Friend): 2.83 (2.31)  
                        Blood (Ethnic): 1.03 (1.45)  
                        Organ (Family/Friend): 2.33 (2.25)  
                        Organ (Ethnic): 0.98 (1.48) | “I would only consider donating my blood [organs] to help a family member or close friend” and “I would be more likely to donate blood if I thought that someone from my own ethnic group was receiving my blood?”, scored 0 strongly disagree to 6 strongly agree | | Amponsah-Afuwape et al., 2002 |

*** p < .001
Table 2

Mean, Standard Deviation and Bivariate Correlations among Predictor and Dependent Variables for Blood and Organ Donation

<table>
<thead>
<tr>
<th>Variable</th>
<th>1</th>
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<td>.74***</td>
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<td>.80***</td>
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<td>.57***</td>
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<td>3. Subjective norm</td>
<td>.42***</td>
<td>.36***</td>
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<td>.48***</td>
<td>.45***</td>
<td>.51***</td>
<td>-.27***</td>
<td>.01</td>
<td>-.04</td>
<td>.06</td>
<td>-.15*</td>
<td>-.00</td>
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<td>.71***</td>
<td>.34***</td>
<td>-</td>
<td>.42***</td>
<td>.55***</td>
<td>-.45***</td>
<td>-.23***</td>
<td>-.02</td>
<td>.03</td>
<td>-.20**</td>
<td>-.17*</td>
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<td>5. Moral norm</td>
<td>.43***</td>
<td>.33***</td>
<td>.43***</td>
<td>-</td>
<td>.61***</td>
<td>-.21**</td>
<td>-.04</td>
<td>-.02</td>
<td>.07</td>
<td>.01</td>
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<td>6. Self-identity</td>
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<td>.54***</td>
<td>.42***</td>
<td>.45***</td>
<td>.52***</td>
<td>-</td>
<td>-.21**</td>
<td>.02</td>
<td>-.04</td>
<td>.17*</td>
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<td>-.30***</td>
<td>-.25**</td>
<td>-.34***</td>
<td>-.27***</td>
<td>-.30***</td>
<td>-</td>
<td>.49***</td>
<td>-.10</td>
<td>-.03</td>
<td>.18**</td>
<td>.25***</td>
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<td>8. In-group altruism (Ethnic)</td>
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<td>-.20**</td>
<td>-.09</td>
<td>-.16*</td>
<td>-.11</td>
<td>-.05</td>
<td>.37***</td>
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<td>-.18**</td>
<td>-.14*</td>
<td>.17**</td>
<td>.19**</td>
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<td>9. Age</td>
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<td>-.06</td>
<td>-.14*</td>
<td>-.12</td>
<td>-.10</td>
<td>-.06</td>
<td>-.02</td>
<td>-.07</td>
<td>-</td>
<td>-.04</td>
<td>-.11</td>
<td>-.16*</td>
</tr>
<tr>
<td>10. Sexa (1 Male, 2 Female)</td>
<td>.09</td>
<td>.12</td>
<td>.11</td>
<td>.10</td>
<td>.02</td>
<td>.17*</td>
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<td>-.05</td>
<td>-.03</td>
<td>-</td>
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<td>-</td>
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<tr>
<td>11. Ethnicitya (1 Caucasian, 2 Other)</td>
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<td>-.10</td>
<td>.01</td>
<td>.03</td>
<td>.01</td>
<td>.12</td>
<td>.17*</td>
<td>-.05</td>
<td>-</td>
<td>-</td>
<td>-</td>
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<tr>
<td>12. Past blood donationa (1 Yes, 2 No)</td>
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<td>-.31</td>
<td>-.16*</td>
<td>-.26***</td>
<td>-.09</td>
<td>-.30***</td>
<td>.24**</td>
<td>.09</td>
<td>-.18*</td>
<td>-</td>
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</table>

*p < .05.  **p < .01.  ***p < .001.  Note. * Dichotomous measure. Correlations for blood donation are below the diagonal. Correlations for organ donation are above the diagonal. Items scored on 7-point scales: higher scores reflect higher endorsement of each item.
### Table 3

*Hierarchical Regression Analyses Predicting Intention to Donate Blood and Organs*

<table>
<thead>
<tr>
<th>Step</th>
<th>Blood donation intentions</th>
<th>Organ donation intentions</th>
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<tbody>
<tr>
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<td>$\Delta F$</td>
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<td>1</td>
<td>.09</td>
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<tr>
<td></td>
<td>Sex (1 Male, 2 Female)</td>
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<tr>
<td></td>
<td>Ethnicity (1 Caucasian, 2 Other)</td>
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<tr>
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<td>Sex (1 Male, 2 Female)</td>
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<tr>
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<td>Ethnicity (1 Caucasian, 2 Other)</td>
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<tr>
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<td>Past blood donation (1 Yes, 2 No)</td>
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<tr>
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<td>Attitude</td>
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<tr>
<td></td>
<td>Subjective norm</td>
<td>.17</td>
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<td></td>
<td>Self-efficacy</td>
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<tr>
<td>3</td>
<td>.03</td>
<td>6.10***</td>
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<tr>
<td></td>
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<tr>
<td></td>
<td>Ethnicity (1 Caucasian, 2 Other)</td>
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<td></td>
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<tr>
<td>---------------------------</td>
<td>----------</td>
<td>----------</td>
</tr>
<tr>
<td>Past blood donation (1 <em>Yes</em>, 2 <em>No</em>)</td>
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<td>.18</td>
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<tr>
<td>Attitude</td>
<td>.29</td>
<td>.08</td>
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<tr>
<td>Subjective norm</td>
<td>.06</td>
<td>.07</td>
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<td>Self-efficacy</td>
<td>.58</td>
<td>.05</td>
</tr>
<tr>
<td>Moral norm</td>
<td>.09</td>
<td>.05</td>
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<tr>
<td>Self-identity</td>
<td>.27</td>
<td>.09</td>
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<tr>
<td>In-group altruism (Family/Friend)</td>
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<td>.03</td>
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<tr>
<td>In-group altruism (Ethnic)</td>
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<td>.05</td>
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</tbody>
</table>

*p < .05. **p < .01. ***p < .001.
Table 4

*Mean Differences in Organ Donation Intention and In-group Altruism for Blood and Organ Donation*

<table>
<thead>
<tr>
<th>Variable</th>
<th>Blood donor</th>
<th>Non-donor</th>
<th>ANCOVA (ethnicity as a covariate)</th>
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<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
<td>M</td>
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<td>In-group altruism (Family/friend)</td>
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<td>2.23</td>
<td>3.16</td>
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<td>Registered</td>
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<tr>
<td>Variable</td>
<td>M</td>
<td>SD</td>
<td>M</td>
</tr>
<tr>
<td>In-group altruism (Family/friend)</td>
<td>1.34</td>
<td>2.18</td>
<td>2.58</td>
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<tr>
<td>In-group altruism (Ethnic)</td>
<td>0.62</td>
<td>1.24</td>
<td>1.07</td>
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<tr>
<td>Blood donor</td>
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<td></td>
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</tr>
<tr>
<td>Variable</td>
<td>M</td>
<td>SD</td>
<td>M</td>
</tr>
<tr>
<td>Organ donation intention</td>
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</table>