It's Only Fair: Blood Donors are More Sensitive to Violations of Fairness Norms than Non-Donors – Converging Psychometric and Ultimatum Game Evidence

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Abstract

Background and Objectives: The design of effective donor recruitment campaigns requires an accurate understanding of donor motivations. This requires cross-validation of theoretically derived, psychometrically assessed motivations with behavioural preferences. Theoretical models suggest that blood donors should be more sensitive than non-donors to violations of fairness norms. Specifically, active blood donors, compared to non-donors, should endorse beliefs of reciprocal fairness, norms of both positive and negative reciprocity and reject more unfair offers in a behavioural economic game (the ultimatum game). The current study is the first to test this hypothesis.

Materials and Methods: Two studies are reported. One experimental psychometric study (N = 400), and one behavioural economic game using the ultimatum game (N = 60).

Results: Consistent with the predictions, active and lapsed donors, compared to non-donors, were more likely to endorse beliefs of reciprocal fairness and active donors to endorse norms of both positive and negative reciprocity and reject more unfair offers in the ultimatum game. This pattern of motivations was unique to blood donors and not observed for other health (i.e., being on the organ donor register) and non-health (e.g., volunteering) pro-sociality.

Conclusion: Blood donors heightened sensitivity to unfairness violations. This indicates a very clear and specific line for the development of interventions that align fairness, self-interest and reciprocity, for example Voluntary Reciprocal Altruism (VRA). We also highlight the importance of establishing intervention development within a clinical trials model and emphasise why experimental work of this type is vital.

Recent evidence indicates that blood donors are motivated by altruistic mechanisms of (1) warm-glow (i.e., the act of donation results in feeling good) and (2) reluctant altruism, rather than pure altruism [1]. Reluctant altruism is a form of *negative* conditional cooperation, as reluctant altruists help *because* others do not [1-3]. Thus, reluctant altruists should more sensitive to violations of fairness norms [1]. Indeed, fairness is a central mechanism for understanding altruism and cooperation. That is, punishing violations of fairness helps to maintain cooperation [4], with increased fairness enhancing positive ("if you are nice to me, I will be nice to you") and negative ("if people do me harm, I will look to take revenge") reciprocity [5] and a desire to reduce inequalities [6]. This is especially the case when people perceive that fairness is intended [7]. Thus, as potential reluctant altruists, it is a reasonable conjecture that blood donors should also have strong beliefs in reciprocal fairness and be more sensitive to violations of fairness norms. The current paper is the first to examine fairness beliefs, reciprocity norms, and responses to violations of fairness norms in blood donors.

Blood Donation and Fairness Norms: Normative Beliefs and The Ultimatum Game

Fairness beliefs can be differentiated into: (1) *reciprocal* and (2) *distributive* fairness [8]. Reciprocal fairness reflects cooperative actions conditional on others' cooperation (cf. conditional cooperation: [5]). Distributive fairness refers to sharing regardless of contribution, to ensure an equal share of resources proportional to need [8]. Reluctant altruism is associated with reciprocal rather than distributive fairness, as reluctant altruists have an underlying desire for a reciprocal cooperative/fair society. As such, we predict that blood donors should be more likely to endorse beliefs about reciprocal fairness. As both positive and negative reciprocity enhance fairness and cooperation [7], blood donors should endorse both more strongly than non-donors.

We use the ultimatum game (UG) as a behavioural test of reactions to violations of fairness norms. In the UG the first player (the proposer) proposes how to divide a sum of money with a second player (the recipient). The recipient has nothing, but knows what money the proposer has. The recipient can accept or reject the proposed division. If they reject the offer, both receive nothing. If the recipient accepts, both parties get the proposed share. Thus, for the responder, the UG pits selfishness (responders are always better off financially by taking any offered) against signalling fairness at a personal cost (losing the money offered) by rejecting unfair offers. Typically, recipients are more likely to reject offers as they become increasing *unfair* (moving from a 50:50 equal share to 90:10 - where the first figure reflects the proposer's share and the second the recipient's). If blood donors are more sensitive to violations of fairness norms, they should exhibit higher rejection rates than non-donors. This should be especially the case for *ambiguously unfair* offers. When a behaviour is *ambiguously unfair*, as seen in UG offers of 60:40 for example, evolutionary theory suggests that people are pre-disposed towards forgiveness as the unfairness may just be an error [9-10]. If blood donors are more sensitive to fairness violations they should reject more ambiguous unfair offers compared to non-donors.

Fairness Interventions.

To explore further the role of fairness beliefs in blood donation, we examine an intervention based on fairness and reciprocity: voluntary reciprocal altruism (VRA) [11]. Specifically, VRA aligns norms of reciprocation, self-interest and fairness by asking people to consider their willingness to both *accept* and *donate* blood. However, it is not clear if the active ingredient of VRA is reciprocal or distributive fairness and if this requires both questions to be asked or whether one question is sufficient. There is evidence that asking about *acceptance* only [12] or willingness only [13] can be effective for behaviour change.

Thus, we randomly allocate participants to respond to either *both* questions, *only one* question or *neither* to explore which affects fairness beliefs maximally.

Donor Status and Pro-social Identity

Blood donation is usually unrelated to other forms of pro-sociality [14]. Thus, blood donation may have a different fairness/reciprocity motivational profile compared to other pro-social acts. If so, recruiting blood donors by targeting other pro-social activities (e.g., organ donors) may not be a fruitful. To explore this we distinguish other pro-social acts in terms of (1) health vs non-health [14] and (2) donating money or time/effort [15]. We also explore the wider influences of family pro-sociality [16]. Finally, we distinguish lapsed from active donors as they show different motivational pattern [17].

Clinical Trials Approach

It has been argued that a 'clinical trials' model should be applied to behavioural interventions [18-19]. This assumes that behavioural interventions, like pharmaceutical interventions, have active ingredients that can have positive effects as well as adverse side-effects [19]. Thus, before rolling out national behavioural intervention campaigns, feasibility trial or RCTs , it is necessary to conduct early stage 1 and 2 laboratory studies [18]. Set within this perspective we present two laboratory studies to test the hypothesis that blood donors are sensitive to violations of fairness and explore the active ingredient of VRA.

Hypotheses

Active blood donors, compared to non-donors will: (1) endorse stronger beliefs for reciprocal fairness, (2) endorse stronger norms of both positive and negative reciprocity and (3) be more likely to reject ambiguously unfair offers in an UG. Lapsed donors will show a similar but weaker pattern.

Study 1: Norms of Reciprocity and Reciprocal and Distributive Fairness Beliefs

This study tests if active blood donors, compared to non-donors, will: (1) endorse stronger beliefs of reciprocal fairness and (2) have stronger norms of both positive and negative reciprocity.

Method

Sample

Using a non-specific sampling strategy (not targeting blood donors and no mention of blood donation in recruitment materials) a convenience sample of 400 undergraduate students were recruited (mean age = 20.3; SD = 3.3; 53% female; See Supplementary File S1 for sample size determination).

Measures

Personal Norms of Reciprocity. These were assessed using the Personal Norms of Reciprocity (PNP) scale, a standardized, reliable and valid measure developed by Perugini et al [20]. Positive reciprocity is assessed by 9 items ($\alpha = .75$) and negative reciprocity by 9 items ($\alpha = .86$). Participants indicate the extent to which each item is true of them (1 completely disagree, to 5 completely agree). Trait individual differences in norms of reciprocity are both stable over time [21].

Reciprocal and Distributive fairness. As there are no existing scales to assess reciprocal and distributive fairness for blood donation, we designed five items to index them. Three item assessed reciprocal fairness (1) "As others have donated blood, it is only fair that I do", (2) "I think it is only fair that everyone donates blood" and (3) "Blood is a resource that is needed, so we should share it". Distributive fairness was assessed by 2 items (1) "If someone has not donated blood, is still fair that they receive a transfusion" and (2) "It is only fair that those who have donated blood get 1st choice on a transfusion" (reverse scored).

VRA Manipulation: We created four VRA conditions: Participants either answered: (1) two questions on their willingness to *make* a donation and to *accept* a transfusion (Full VRA condition), or (2) one questions on their willingness to *accept* a transfusion (Acceptance condition), or (3) one questions on their willingness to *make* a donation (Make condition) or (4) *neither* question (Control).

Blood Donor Status: The following procedure was used to index non-donor, lapsed and active donor status. Initially respondents indicated if they had ever donated blood (Yes/No). Those who indicated 'No' were classed as non-donors. Those indicating 'Yes' then indicated: (1) "Have you ever donated blood in the past, but do not now?" Yes/No and (2) "Are you currently an active blood donor?" Yes/No. Answering 'Yes' to the first question resulted in *'lapsed donor'* classification and 'Yes' to the second as *'active donor'* classification. This is a standard and reliable index of blood donor status [22-23].

Other Pro-social Acts: Participants responded to each of the following questions: Yes or No, to indicate (1) a *family norm/attitude* to helping ("Are your close family members involved in any form of charity work"), (2) *effortful* helping ("I have taken part in fund-raising events"), (3) *financial* helping ("I have donated money) and (4) other *health philanthropy* ("I am on the organ donors register").

Design & Procedure

Participants were randomly allocated to one of four VRA conditions, (N = 100 per condition), and then completed the indices of reciprocal and distributive fairness and norms of reciprocity. The study was registered and approved by the University of Nottingham, School of Psychology ethics procedures (ref 193).

Results & Discussion

Donor Status and Prosocial Self-Categorization

Of the 400 participants, 319 (79.75%) were non-donors, 39 (9.75%) lapsed donors and 42 (10.5%) active donors. A total of 154 reported being on the organ donor register (38%), 146 (37%) had family members involved in charity, 302 (75%) had been involved in fundraising and 313 (78%) had donated money. Being an active donor was positively associated with being on the organ register but unrelated to fundraising and donating money (see Supplementary File S2).

Is Blood Donor Status Predicted by Norms of Reciprocity?

Individual differences in norm reciprocity were entered as predictors of donor status in a multi-nominal regression model. We controlled for age and sex effects that may influence norms of reciprocity [22] other pro-social behaviours, and experimental condition. Experimental condition was included as norms of positive reciprocity were significantly higher in the *accept* (B = 1.39; Se= .665 p = .038; *95% CI* 0.08, 2.69) and *VRA* (B = 1.50; Se= .640 p = .019; *95% CI* 0.25, 2.76) conditions compared to the *control* condition. Active donors, compared to non-donors, are more likely to hold stronger norms about both positive and negative reciprocity (Table 1). There were no significant associations for lapsed donors. Norms of reciprocity did not predict organ donor status, fundraising or donating money, but positive reciprocity predicted familial pro-sociality (Supplementary File S2).

Structure of Fairness Beliefs. To provide initial validity for our distinction between reciprocal and distributive fairness we applied Principal Axis Factor (PAF) analysis with oblique rotation to the 5 fairness items we designed. Based on the Scree test, a 2 factor solution (Table 2) was supported. The three reciprocal fairness items loaded onto factor 1 and the two distributive fairness items onto factor 2. Both factors were internally reliable (reciprocal fairness α = .70 and distributive fairness inter-item correlation = .36).

Prediction of Fairness Beliefs. Predictors of both reciprocal and distributive fairness beliefs were analyzed jointly using Seemingly Unrelated Regression (SUR) models (Table 3) to account for the correlated error variance across the two regression models (Breusch-Pagan $\chi^2 = 6.83$, $p = .009$). Blood donor status (active and lapsed) predicted having stronger beliefs in reciprocal fairness but not distributive fairness. This association was twice as large for active compared to lapsed donors. Neither reciprocal nor distributive fairness were predicted by other non-health pro-social acts but are associated with being with being on the donor register. Thus, blood donation is specific to reciprocal fairness while endorsing being on the organ donor register is general to both reciprocal and distributive fairness. Those exposed to the acceptance VRA condition were also more likely to endorse reciprocal fairness. Distributive fairness was endorsed more by women. When norms of reciprocity are controlled (Supplementary File S2), the results remain the same.

Sensitivity Analyses. To ensure that these results were not a function of different number of cases for active (N= 42), lapsed (N = 39) and non-donors (N = 319), we randomly selected 39 participants from the active and non-donors and re-ran all the regression analyses. The results were identical to those presented above.

Study 2: Ultimatum Game and Violations of Fairness Norms

Study 2 tests the third hypothesis: compared to non-donors, blood donors will be more likely to reject ambiguously unfair offers in an ultimatum game.

Method

Sample

A non-directed convenience sample of 60 undergraduate students were recruited to the experiment and tested individually (mean age = 21.8; SD = 1.8; 55% female: See Supplementary File S1).

Procedure: The Ultimatum Game

The Ultimatum Game (UG) was programmed in E-Prime and consisted of 64 offers. Thirty-two trials were of equal 50:50 splits. For the 60:40, 70:30, 80:20 and 90:10 there were 8 trials each. The distribution of trials is designed to represent the distribution of trials observed in typical UGs [10]. All participants completed the 64 trials, presented in a randomized order for each individual, seated in an individual experimental cubical. All participants played the role of the recipient and were told that if they rejected the offer, neither got the money and if they accepted it they and the proposer got the money in terms of the offer made. At the start, participants were told that 64 proposers had been given £10 ($16.72) and asked how much they would give to another individual. Each UG trial was played as follows (see Figure 1). At the start of the trial, the participant was presented with a fixation point for 2 seconds, followed by the ID number (no photographs or names were used) of the proposer making the offer (e.g., Proposer 32). Responders were then presented with the 'offer screen' in the format "THEY KEEP £7, YOU GET £3". The 'offer screen' remained visible for 2s followed by the 'response screen'. On the 'response screen' the recipient indicated their decision to accept (by pressing a green key) or reject (by pressing a red key) the presented offer. The amount of time taken to make decision (decision time: DT) by each participants was recorded automatically (these data are not analyzed – see Supplementary File S3). A screen then reminded them of their decision – for example: 'You Accepted. Proposer 32 gets £7 and you get £3'. This feedback was displayed for 2s. After this a new trial began. There is good evidence that rejection decisions in the UG represent a temporally stable preference [24].

There was no show up fee, but the UG was incentivized using a conditional lottery mechanism whereby participants were told they are making decisions for real money, and

that after the experiment one of their 64 trials would be selected at random and they will be paid based on that trial [25]. All participants were debriefed and paid at the end of the study.

The study design was registered and approved by the University of Nottingham, School of Psychology ethics procedure (AS/hcf 27th October 2010).

Blood donor Status. Blood donor status was indexed by asking: "Are you currently a blood donor?" Yes/No/Used to be.

Results & Discussion

Blood Donor Status

Of the 60 participants, 40 (66.7%) were non-donors, 16 (26.7%) donors (4 lapsed donors: 6.7%). Lapsed donors were excluded from the analyses.

Ultimatum Game Rejection Rates

To test the hypothesis that blood donors are less likely to accept unfair offers (60:40 to 90:10) and in particular ambiguously unfair offers (60:40 and 70:30), we conducted a 4 (unfair offer) by 2 (donor status) repeated measures ANOVA, with proportion of the four unfair offers (60:40 to 90:10) as the within subjects factor and donor status as the between subjects factor. Type III sum-of-squares was used to account for the unequal cell sizes. The results showed (1) a main effect for unfair offers (F Greenhouse–Geisser correction $_{(2.3, 127.07)}$ = 93.91, p = .000, ε_p^2 = .6350) with acceptance rates linearly reducing with increased unfairness ($F_{(1, 54)}$ = 194.34, p = .027, ε_p^2 = .783), (2) a main effect for donor status ($F_{(1, 54)}$ = 6.15, p = .016, ε_p^2 = .102) with donors having a lower overall acceptance rate (see Figure 2) and (3) an interaction between donor status and unfairness of offers (F Greenhouse–Geisser correction $_{(2.3, 127.07)}$ = 3.47, p = .027, ε_p^2 = .060: see Figure 3). Figure 3 shows that this interaction was, as hypothesized, predominantly observed for the ambiguously unfair offers of 60:40 and 70:10. The results show clearly that, compared to non-donors, blood donors are

more sensitive to violations of norms of fairness, and more likely to reject unfair offers and especially if the unfairness is ambiguous.

General Discussion

The 'mechanisms of altruism' (MOA) approach to blood donor motivation, proposes the need to explore how the theoretical mechanisms that underlie altruism can either differentiate donors and non-donors or predict blood donor behaviour [1]. The results reported here explore mechanisms based on fairness norms. The results show that active, and to a lesser extent lapsed donors, were more likely to endorse reciprocal fairness with active donors endorsed higher levels of positive and negative reciprocity relative to non-donors. Active donors, compared to non-donors, also rejected more unfair offers, especially ambiguously unfair offers, in the UG. As well as being consistent with the idea of blood donors as reluctant altruist, the results also support the idea that active blood donors were more willing, than non-donors, to incur *personal cost* to reject unfair offers, thus signaling disapproval, and maintaining their self-image as a morally good 'saintly' person [1, 26].

Practical Implications. These studies also provide insights for donor recruitment. First, the blood donor profile is different to other acts of pro-sociality and as such targeting other pro-social acts to recruit may no be successful. Second these results show that asking if a person would *accept a transfusion* (a component of voluntary reciprocal altruism VRA) also increases a sense of reciprocal fairness - the same motivation that underlies blood donation. This matching of motivations across intervention and person is likely to result in more successful campaigns [27]. Thus, VRA should help to maintain active donors and reactivating lapsed donors.

Clinical Trails: Surveys and Experiments.

We advocate a clinical trials model for behavioral interventions. This paper shows why experiments are a valuable first step. Triangulation of results across these different

experimental methods strengthen any conclusions and helps minimize the influence of any one method bias. For example, surveys may suffer from common method variance [but see 28] and social desirability responding, while experimental studies may lack external validity [but see 29]. The next step would be to conduct acceptability trials to develop the accumulated evidence before a full RCT and ultimate deployment of a campaign.

Caveat

While not answering the casual question – "do blood donors (actually sampled or self-categorized) endorse reciprocal fairness or are those who have reciprocal fairness preferences more likely to be blood donors?" – we do show these motivations are specific to blood donation and that interventions that focus on reciprocal norms may be uniquely important for maintaining active donors and re-activating lapsed donors.

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References

[1]. Ferguson E. Mechanisms of altruism approach to blood donor recruitment and retention: a review and future directions *Trans Med* 2015; 25: 211-226.

[2]. Ferguson E, Atsma F, de Kort W, Veldhuizen I. Exploring the Pattern of Blood Donor Beliefs in First Time, Novice and Experienced Donors: Differentiating Reluctant Altruism, Pure Altruism, Impure Altruism and Warm-Glow *Transfusion,* 2012; 52: 343-355.

[3]. Ferguson E, Masser B. (In press). Emotions and pro-sociality: Lessons for Blood Donation (in: "*Affective Determinants of Health-Related Behavior*". David M. Williams, Ryan E. Rhodes, and Mark T. Conner (Editors). Oxford University Press.

[4] Boyd R, Gintis H,. The evolution of altruistic punishment. *Proc. Natl. Acad. Sci*., 100; 2003: 3531–3535.

[5]. Fischbacher U, Gatcher S, Fehr E. Are people conditionally cooperative? Evidence from a public goods game. *Econ Lets* 2001; 71*:* 397-404.

[6]. Fehr E, Schmidt K. A theory of fairness, competition and cooperation. *Q J Econ* 1999; 114: 817-868

[7]. Falk A, Fischnacher U. A Theory of reciprocity. *Games Econ Behav* 2006; 54: 293-315.

[8]. Kamas L, Preston A. Distributive and reciprocal fairness: what can we learn from the heterogeneity of social preferences? *J Econ Psychol* 2012; 33: 538-553.

[9]. Nowak M, Highfelid, R. (2012). *Super Cooperators.* Canongate Books Ltd., Edinburgh (1-330).

[10]. Ferguson E, Maltby J, Bibby P, Lawrence C. Fast to forgive, slow to retaliate: Intuitive responses in the ultimatum game depend on the degree of unfairness. *PLoS One*, 2014; 9: 5 article e96344.

[11]. Landry DW. Voluntary reciprocal altruism: A novel strategy to encourage deceased organ donation. *Kidney Internat* 2006; 69*:* 957-959.

[12]. Harper H., et al. (2015) *Applying behavioural insights to organ donation: Preliminary results from a randomized controlled trial*. Cabinet Office (http://38r8om2xjhhl25mw24492dir.wpengine.netdna-cdn.com/wp-content/uploads/2015/07/Applying_Behavioural_Insights_to_Organ_Donation_report.pdf)

[13]. Wilding S, Conner M, Sandberg T, Prestwich A, Lawton R, Wood C, Miles E, Godin G, Sheeran P. The question behaviour effect: A theoretical and methodological review and meta-analysis, *Euro Rev Soc Psychol* 2016; *27*: 196-230.

[14]. Bekkers, R, Traditional and health-related philanthropy: The role of resources and personality. *Social Psychology Quarterly* 2006; 69: 349-366.

[15]. Reed A, Kay A, Finnel S, Aquino K, Levy E. I don't want the money, I just want your time: how moral identity overcomes aversion to give time to prosocial causes. *J Pers Soc Pyschol* 200xx; 110: xxx – xxx

[16]. Bekkers R. Charity begins at home: How socialization experiences influence giving and volunteering 2005; downloaded 07-09-2017 University of Groningen

[17]. Bednall, Bove LL. Donating blood: A meta-analytic review of self-reported motivators and deterrents. *Trans Med Revs,* 2011; 25: 317-334.

[18]. Campbell M., Fitzpatrock R, Haines A, Kinmouth AL, Sanercock P, Speiegelhalter D, Tyrer P. Framework for design and evaluation of complex interventions to improve health *BMJ* 2000; 321: 694-696.

[19]. Lorenz T, Oliver K. Adverse effecst iof punlic healklth interventions: a concept[tual framework. *J Epidemiol Community Health* 2014; 68: 288=290.

[20]. Perugini M, Gallucci M, Presaghi F, Ercolan AP. The personal norm of reciprocity. *Euro J Pers* 2003; 17*:* 251-283.

[21]. Pervan SJ, Bove LL, Johnson LW. Reciprocity as a key stabilizing norm of interpersonal marketing relationships: Scale development and validation. *Indust Market Manage* 2009; 38: 60-70

[22]. Ferguson E, Bibby PA. Predicting future blood donor returns: past behavior, intentions and observer effects. *Health Psychol* 2002; 21:513-518.

[23]. Holdershaw J, Gendall P, Wright M. Predicting willingness to donate blood. *Australian Marketing J*. 2003;11:87-96

[24]. de Oliveira A, Ecke, CC, Croson RT. The stability of social preferences in a low income neighborhood. *Southern Econ J* 2012; 79: 15-45.

[25]. Bardsley N Control Without Deception: Individual Behaviour in Free-Riding Experiments Revisited. *Exper Econ* 2000; 3: 215-240.

[26]. Debove S, Baumard N, André J-B. Models of the evolution of fairness in the ultimatum game: a review and classification *Evol Hum Behav* 2016; 37: 245-254.

[27]. Clary EG, Snyder M. Motivations to volunteer: Theoretical and Practical considerations. *Curr Dir Psychol Sci* 1999; 8: 156-159.

[28]. Podsakoff PM, MacKenzie SB, Jeong-Yeon Lee JY. Podsakoff NP. Common Method Biases in Behavioral Research: A Critical Review of the Literature and Recommended Remedies. *J Appl Psychol*, 2003; 88: 879–90

[29]. Mook DG. In Defense of External Invalidity. *Am Psychol* 1983; 38: 379-387

Table 1. *Multi-Nominal Regression Model Predicting Donor Status From Reciprocity Norms*

			95% CI	
	B (se)	p	Lower	Upper
Lapsed Donors				
Positive Reciprocity Norms	0.07 (0.04)	.669	-0.07	0.10
Negative Reciprocity Norms	-0.01 (0.02)	.559	-0.06	0.03
Age	0.08 (0.05)	.107	-0.02	0.19
Sex (0 = female, 1 = male)	-0.19(0.37)	.616	-0.54	0.92
Experimental Conditions				
Accept a donation[(a)]	-0.24 (0.48)	.614	-1.19	0.71
Make a donation[(a)]	-0.32 (0.49)	.509	-1.28	0.64
VRA (accept + make) [(a)]	-0.54 (0.50)	.284	-1.52	0.45
Donate Money (0 = no, 1 = yes)	-0.33 (0.48)	.485	-1.29	0.61
Family Involved in Charity (0 = no, 1 = Yes)	0.88 (0.37)	.020*	0.14	1.61
Fundraising (0 = no. 1 = yes)	-0.16 (0.47)	.735	-1.09	0.77
On the Organ Donor Register (0 = no. 1 = yes)	0.82 (0.36)	.025*	0.11	1.53

			95% CI	
	B (se)	p	Lower	Upper
Active Donors				
Positive Reciprocity Norms	0.10 (0.04)	.016*	0.02	0.18
Negative Reciprocity Norms	0.05 (0.03)	.053*	-0.0006	0.11
Age	0.07 (0.06)	.264	-0.05	0.20
Sex (0 = female, 1 = male)	-0.21 (0.45)	.623	-1.07	0.64
Experimental Conditions				
Accept a donation[(a)]	-0.32 (0.34)	.345	-0.98	0.34
Make a donation[(a)]	-0.30 (0.34)	.370	-0.97	0.36
VRA (accept + make) [(a)]	-0.43 (0.35)	.341	-1.03	0.36
Donate Money (0 = no, 1 = yes)	0,16 (0.30)	.591	-0.43	0.76
Family Involved in Charity (0 = no, 1 = Yes)	-0.13 (0.25)	.611	-0.62	0.36
Fundraising (0 = no. 1 = yes)	0.02 (0.39)	.953	-0.59	0.61
On the Organ Donor Register (0 = no. 1 = yes)	0.54 (0.25	.033*	0.04	1.04

Note. Reference group in non-donors. Total N = 385. (a) Reference category for experimental manipulation is the control condition

Table 2. *Promax Rotated Factor Matrix for Fairness Beliefs*

	Reciprocal Fairness	***Distributive Fairness***
As others have donated blood it is only fair that I do	**.79**	-.07
I think it is only fair that everyone donates blood	**.67**	-.21
Blood is a resources that is needed so we should share it	**.65**	.13
It is only fair that those who have donated blood get 1st choice on a transfusion	.08	**-.66**
If someone has not donated blood is still fair that they receive a transfusion	.00	**.54**
Correlation between latent factors	1	
	-.05	1
Eigenvalue (% variance)	1.91 (38.18%)	1.40 (27.93)
Reliability	α = .70	*mic* = .36

Table 3. *Seemingly Unrelated Regression for Reciprocal and Distributive Fairness Beliefs*

			95% CI	
	B (se)	p	Lower	Upper
Reciprocal Fairness				
Donor Status				
Lapsed[(a)]	1.31 (0.66)	.048*	0.01	2.61
Active[(a)]	2.53 (0.65)	.000***	1.25	3.82
Age	0.02 (0.06)	.732	-0.09	0.13
Sex (0 = female, 1 = male)	-0.23(0.39)	.551	-1.00	0.53
Experimental Conditions				
Accept a donation[(b)]	1.18 (0.55)	.032*	0.10	2.26
Make a donation[(b)]	-0.42 (0.54)	.433	-1.47	0.64
VRA (accept + make) [(b)]	-0.19 (0.55)	.731	-1.26	0.88
Donate Money (0 = no, 1 = yes)	0.42 (0.49)	.386	-0.54	1.40
Family Involved in Charity (0 = no, 1 = Yes)	-0.39 (0.41)	.341	-1.19	0.41
Fundraising (0 = no. 1 = yes)	0.37 (0.48)	.430	-0.56	1.32
On the Organ Donor Register (0 = no. 1 = yes)	1.05(0.42)	.012*	0.23	1.87
R^2 .11; p = .000				

			95% CI	
	B (se)	p	Lower	Upper
Distributive Fairness				
Donor Status				
Lapsed[(a)]	-0.51 (0.41)	.212	-1.31	0.29
Active[(a)]	0.62(0.40)	.123	-0.17	1.41
Age	0.01 (0.04)	.780	-0.06	0.08
Sex (0 = female, 1 = male)	-0.85 (0.24)	.000***	-1.33	-0.38
Experimental Conditions				
Accept a donation[(b)]	-0.32 (0.34)	.349	-0.98	0.35
Make a donation[(b)]	-0.30 (0.33)	.366	-0.95	0.35
VRA (accept + make) [(b)]	-0.34 (0.34)	.319	-0.99	0.32
Donate Money (0 = no, 1 = yes)	0.16 (0.30)	.593	-0.43	0.76
Family Involved in Charity (0 = no, 1 = Yes)	-0.13 (0.25)	.615	-0.62	0.37
Fundraising (0 = no. 1 = yes)	0.02 (0.29)	.953	-0.56	0.59
On the Organ Donor Register (0 = no. 1 = yes)	0.54 (0.26)	.034*	0.04	1.04
R^2 .07; p = .002				

Note. Total N = 394. (a) Reference category for donor status is non-donor; (b) Reference category for experimental manipulation is the control condition

Figure 1. *Ultimatum Game Schematic of Procedure*

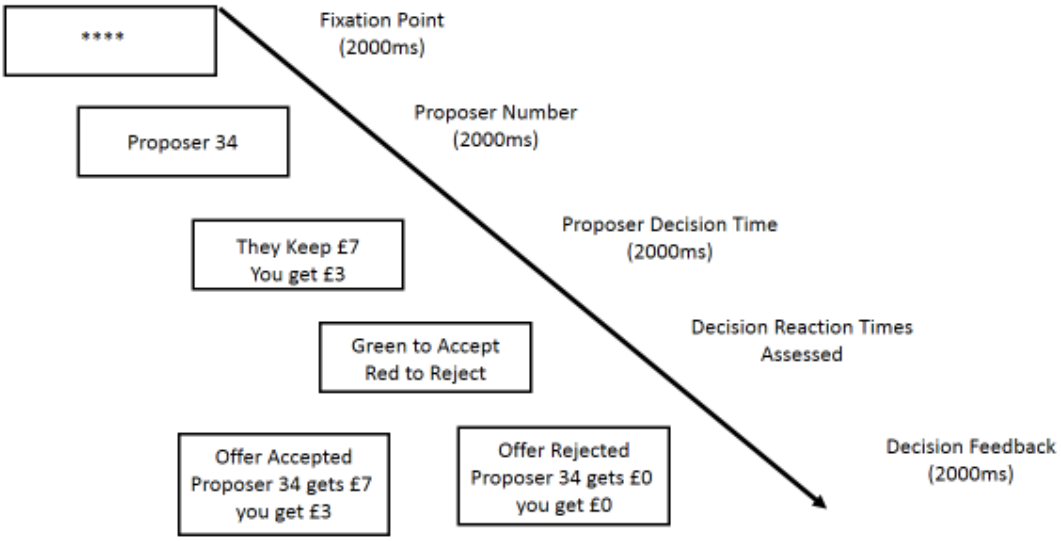


Figure 2. *Mean Difference in Acceptance Rates for Unfair Offer between Donors and Non-Donors (error bars = 95% CIs)*

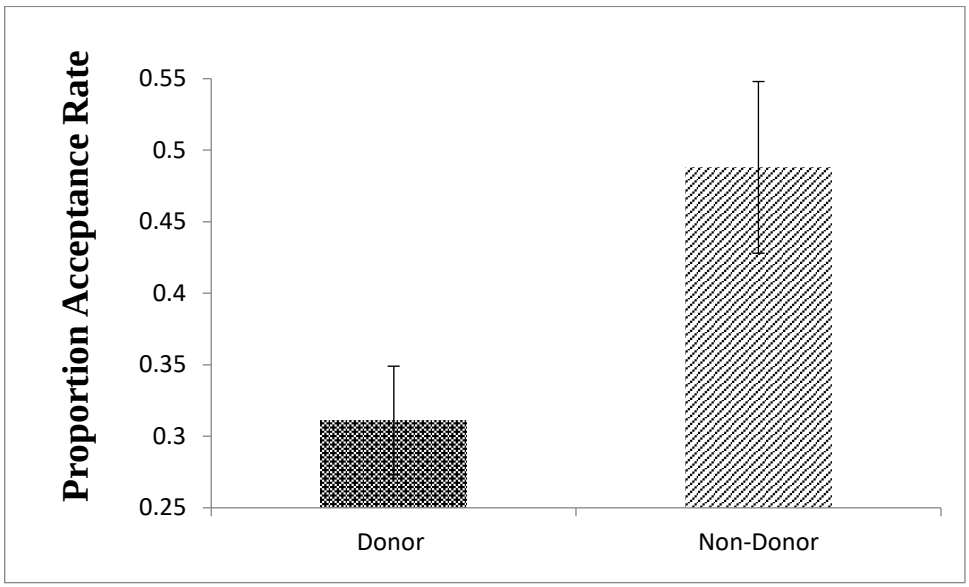
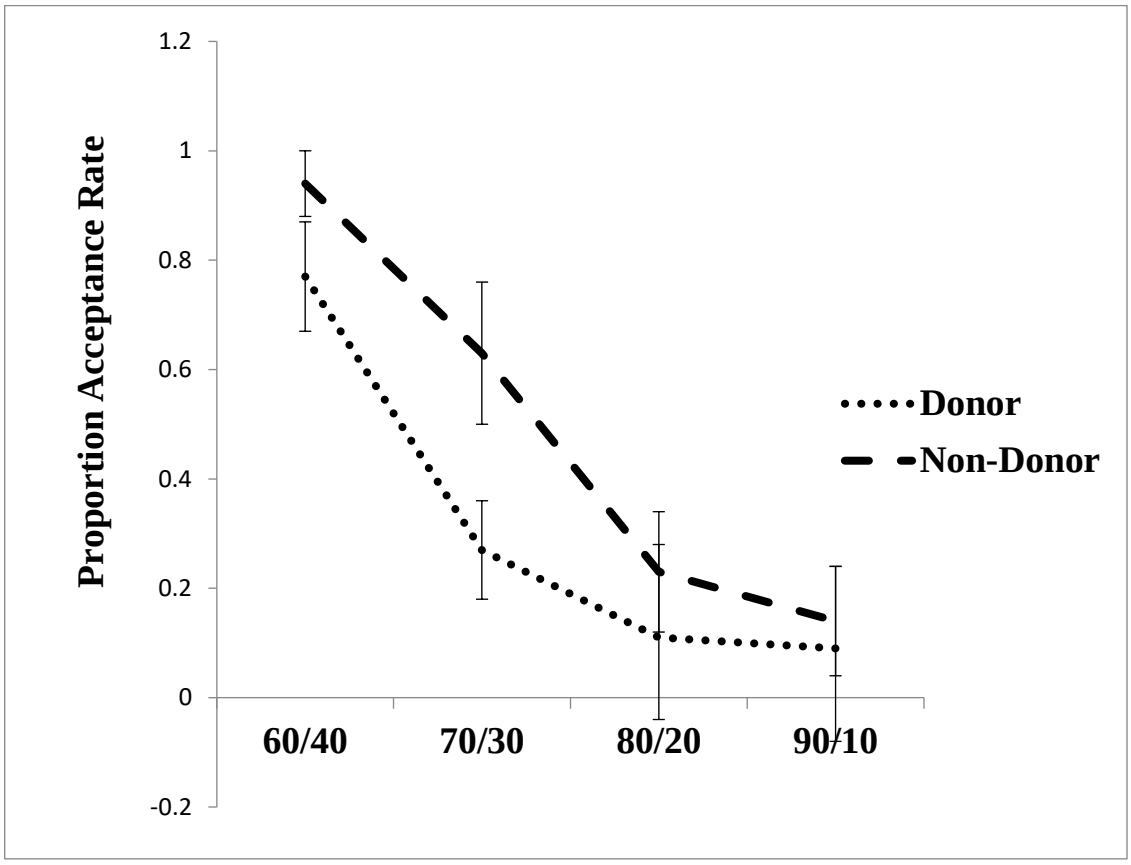


Figure 3. *Interaction between donor status (donor vs non-donor) and Degree of Unfairness in Offers (error bars = 95% CIs)*



Supplementary Files

Supplementary File S1: Sampling Strategy & Sample Size Estimations

This file details sampling strategy used in the two studies and the sample size estimations**.**

Sampling Strategy

Blood donor recruitment/retention campaigns (1) take place distally to donation and (2) people's emotional response to blood donation changes the more proximal they are to making a donation [1]. Thus, sampling at blood drives may lead to biased results for recruitment/retention purposes. Also actively recruiting blood donors to laboratory studies may bias sampling. Thus, rather than recruit blood donors to studies we ask people to self-classify as blood donors which is a reliable index of blood donor status [2-4]

Study 1: Psychometric Study

The N of 400 was based on the following considerations. A Cohen's d of 1.05 for people's preferences to donate blood has been reported for a VRA manipulation [5]. Thus to achieve 80% power with α of .05 requires 32 per cell [6]. Ferguson et al [7] reported an average effect size with a d of 0.65 comparing blood donors vs non-donors on an economic game, which equates to an N of 39 per cell to compare lapsed or active donors to non-donors. Given that 20-26% generally self-categorize as a donor in these types of studies [7] we sampled 400 participants to give approximately 80 reporting donating in the past. Whether these would be split equally between active and lapsed donors would be observed rather than predicted.

Study 2: Ultimatum Game

Bethel-Haurwitz et al [8] reported a significant effect on UG rejection rates for 16 living altruistic kidney donors compared to 29 controls. . Furthermore, main effects for blood

donors vs controls has been reported with similar sample sizes on other economic games [7]. Thus given that 20-26% usually report being a blood donor we recruited 60 participants to sample 20 donors.

References

[1] Rebeska C, Masser, B. Right here, right now: The impact of the blood donation context on anxiety, attitudes, subjective norms,, self-efficacy and intentions to donate. *Transfusion* 2012; 52: 1560-1566.

[2]. Ferguson E, Bibby PA. Predicting future blood donor returns: past behavior, intentions and observer effects. *Health Psychol* 2002; 21:513-518.

[3]. Ferguson E, Farrell K, Lawrence C.. Blood donation is an act of benevolence rather than altruism. *Health Psychol* 2008; 27*;* 327-336.

[4]. Holdershaw J, Gendall P, Wright M. Predicting willingness to donate blood. *Australian Marketing J*. 2003;11:87-96

[5]. Ferguson, E (2017). *What really motivates people to donate and what can we do with what we find out?* Australian Red Cross Transfusion Update Meeting Sydney 2017 (27th to 28th April).

[6]. Cohen J. A Power Primer. *Psychol Bull* 1992; 112: 155-159

[7]. Ferguson E, Taylor M, Keatley D, Flynn N, Lawrence. Blood Donors' Helping Behavior is Driven by Warm Glow More Evidence For the Blood Donor Benevolence Hypothesis. *Transfusion* 2012; *52:* 2189-2200

[8]. Bethel-Haurwitz KM, Stoycvos SA, Cardinale EM, Huebner B, Marsh AA. Is costly punishment altruistic? Exploring rejection of unfair offers in the ultimatum game in real world altruists. *Sci Reps* 2016; 6: 18974

Supplementary File S2: Additional analyses for Study 1

This file contain addition analyses to support the conclusion drawn from study 1

Table S1. *Logistic Regression Models Prediction Other Pro-social Behaviours*

			95% CI	
	OR	p	Lower	Upper
Organ Donor Status				
Positive Reciprocity	0.98	.481	0.93	1.03
Negative Reciprocity	0.98	.315	0.95	1.02
Age	0.98	.564	0.92	1.05
Sex (0 = female, 1 = male)	0.72	.180	0.46	1.16
Experimental Conditions				
Accept a donation[(b)]	1.34	.369	0.70	2.55
Make a donation[(b)]	0.95	.889	0.50	1.82
VRA (accept + make) [(b)]	1.60	.143	0.85	3.02
Donate Money (0 = no, 1 = yes)	1.79	.067	1.0.96	3.35
Family Involved in Charity (0 = no, 1 = Yes)	1.15	.561	0.72	1.84
Fundraising (0 = no. 1 = yes)	1.66	.090	0.92	3.01
Blood Donor Status				
Lapsed [(a)]	**2.38**	**.018**	**1.15**	**4.92**
Active [(a)]	**9.99**	**.000**	**4.16**	**24.03**
$\mathbf{R^2}$; p = .000	0.11			

			95% CI	
	OR	p	Lower	Upper
Donated Money				
Positive Reciprocity	1.06	.053	0.99	1.12
Negative Reciprocity	0.96	.087	0.93	1.00
Age	1.12	.065	0.99	1.26
Sex (0 = female, 1 = male)	0.60	.084	0.34	1.06
Experimental Conditions				
Accept a donation[(b)]	0.77	.513	0.34	1.69
Make a donation[(b)]	0.77	.494	0.37	1.61
VRA (accept + make) [(b)]	1.53	.308	0.67	3.49
Organ Donor Status (0 = no, 1 = yes)	**1.90**	**.050**	**0.99**	**3.61**
Family Involved in Charity (0 = no, 1 = Yes)	1.56	.155	0.84	2.92
Fundraising (0 = no. 1 = yes)	**4.66**	**.000**	**2.58**	**8.43**
Blood Donor Status				
Lapsed [(a)]	0.75	.558	0.29	1.94
Active [(a)]	0.63	.384	0.22	1.78
$\mathbf{R^2}$; p = .000	.16			

			95% CI	
	OR	p	Lower	Upper
Familial Pro-Sociality				
Positive Reciprocity	**1.05**	**.048**	**1.00**	**1.10**
Negative Reciprocity	1.00	.765	0.97	1.04
Age	0.98	.522	0.91	1.04
Sex (0 = female, 1 = male)	0.71	.153	0.45	1.13
Experimental Conditions				
Accept a donation[(b)]	0.84	.589	0.45	1.57
Make a donation[(b)]	0.74	.333	0.40	1.37
VRA (accept + make) [(b)]	0.57	.074	0.30	1.06
Donate Money (0 = no, 1 = yes)	1.61	.129	0.87	2.96
Organ Donor Status (0 = no, 1 = Yes)	1.15	.554	0.72	1.85
Fundraising (0 = no. 1 = yes)	**1.91**	**.030**	**1.07**	**3.44**
Blood Donor Status				
Lapsed [(a)]	**2.43**	**.016**	**1.17**	**5.00**
Active [(a)]	**2.41**	**.019**	**1.15**	**5.04**
$\mathbf{R^2}$; p = .000	.07			

			95% CI	
	OR	p	Lower	Upper
Fundraising				
Positive Reciprocity	0.95	.083	0.89	1.01
Negative Reciprocity	0.99	.959	0.96	1.04
Age	0.98	.703	0.91	1.07
Sex (0 = female, 1 = male)	0.67	.153	0.39	1.15
Experimental Conditions				
Accept a donation[(b)]	**4.76**	**.001**	**1.97**	**11.47**
Make a donation[(b)]	0.99	.995	0.51	1.95
VRA (accept + make) [(b)]	1.31	.448	0.64	2.67
Donate Money (0 = no, 1 = yes)	**4.42**	**.000**	**2.46**	**7.93**
Family Involved in Charity (0 = no, 1 = Yes)	**1.97**	**.025**	**1.09**	**3.56**
Organ Donor Status (0 = no. 1 = yes)	1.67	.093	0.92	3.02
Blood Donor Status				
Lapsed [(a)]	0.81	.660	0.32	2.03
Active [(a)]	1.04	.938	0.39	2.77
$\mathbf{R^2}$; p = .000	.15			

Note. Total N = 385 for each model. (a) Reference category for donor status is non-donor; (b) Reference category for experimental manipulation is the control condition

Table S2. *Seemingly Unrelated Regression for Reciprocal and Distributive Fairness Beliefs including Norms of Reciprocity*

			95% CI	
	B (se)	p	Lower	Upper
Reciprocal Fairness				
Donor Status				
Lapsed[(a)]	**1.31**	**.050**	**-0.002**	**2.63**
Active[(a)]	**2.22**	**.001**	**0.88**	**3.55**
Age	0.008	.889	-0.11	0.12
Sex (0 = female, 1 = male)	-0.26	.520	-1.06	0.53
Experimental Conditions				
Accept a donation[(b)]	0.89	.115	-0.22	1.99
Make a donation[(b)]	-0.50	.358	-1.57	0.57
VRA (accept + make) [(b)]	-0.43	.438	-1.51	0.65
Donate Money (0 = no, 1 = yes)	0.35	.491	-0.65	1.35
Family Involved in Charity (0 = no, 1 = Yes)	-0.54	.195	-1.35	0.28
Fundraising (0 = no. 1 = yes)	0.49	.323	-0.48	1.45
On the Organ Donor Register (0 = no. 1 = yes)	**1.18**	**.005**	**0.34**	**2.01**
Positive Reciprocity	**0.11**	**.016**	**0.02**	**0.19**
Negative Reciprocity	-0.003	.911	-0.06	0.05
R^2 .12; p = .000				

			95% CI	
	B (se)	p	Lower	Upper
Distributive Fairness				
Donor Status				
Lapsed[(a)]	-0.61	.133	-.40	0.19
Active[(a)]	0.75	.068	-0.06	1.56
Age	0.004	.896	-0.06	0.07
Sex (0 = female, 1 = male)	**-0.60**	**.015**	**-1.07**	**-0.11**
Experimental Conditions				
Accept a donation[(b)]	-0.32	.346	-0.99	0.3
Make a donation[(b)]	-0.34	.309	-0.98	0.32
VRA (accept + make) [(b)]	-0.33	.330	-0.98	0.33
Donate Money (0 = no, 1 = yes)	0.06	.846	-0.55	0.67
Family Involved in Charity (0 = no, 1 = Yes)	-0.08	.738	-0.57	0.41
Fundraising (0 = no. 1 = yes)	0.07	.808	-0.51	0.65
On the Organ Donor Register (0 = no. 1 = yes)	0.43	.093	-0.07	0.93
Positive Reciprocity	0.03	.194	-0.02	0.09
Negative Reciprocity	**-0.07**	**.000**	**-0.11**	**-0.04**
R^2 .11; p = .000				

Note. Total N = 384. (a) Reference category for donor status is non-donor; (b) Reference category for experimental manipulation is the control condition

Supplementary File S3: Decision Time Data

There is now a growing debate about how to interpret decision time data of this type. Results show that extreme responders – very fast and very slow – may be more cooperative [1] and the recommendation now is not to use DT data to explore intuitive cooperation but rather experimentally manipulated time delays. As such, DT data are not presented here.

Reference

[1]. Evans, A. M., Dillon, K. D., & Rand, D. G. (2015). Fast but not intuitive, slow but not reflective: Decision conflict drives reaction times in social dilemmas. *Journal of Experimental Psychology: General, 144*(5), 951-966.