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**Mechanism of Altruism (MOA) Approach to Blood Donor Recruitment and Retention:**

**A Review and Future Directions**

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**Running Header**: Altruism and Blood Donation

# Abstract

**Background and Objectives**. Why do people donate blood? Altruism is the common answer. However, altruism is a complex construct and to answer this question requires a systematic analysis of the insights from the biology, economics and psychology of altruism. I term this the Mechanism of Altruism (MOA) approach and apply it here to understanding blood donor motivation.. The answer also has enormous implications for the type of interventions we choose to adopt as a society.

**Methods**. A review of the literature on altruism and blood donation.

**Results.** A MOA approach so far shows that blood donors are a mixture of (1) warm-glow givers (donation is emotionally rewarding) and (2) reluctant altruists (cooperate rather than defect when free-riding is high). Donors also show 'saintly sinning' with the extra 'moral currency' form blood donation allowing them to be less generous in other contexts. The MOA suggests why financial incentives, in terms of gifts/lottery tickets, are effective and suggests a number of novel interventions for donor recruitment: 'voluntary reciprocal altruism' and 'charitable incentivization'. It highlights the need for an intervention for both recipients to show their gratitude and society to celebrate blood donors and suggests a 'Monument to Blood Donors' will achieve this. The approach suggests a number of novel research questions into (1) donor self-selection effects, (2) conditional cooperation and (3) construct overlap with Theory of Planned Behaviour (e.g., affective attitudes and warm-glow).

**Conclusions**. The MOA offers a powerful way to understand blood donor motivations around altruism and develop theoretically driven interventions.

Why do people donate blood? On the surface this question appears simple: donors are altruistic (Steinberg, 2010). However, this question is much more complex when one considers that, while, as a behaviour blood donation may be regarded as altruistic, the motivations underlying it may not be (Ferguson & Lawrence, 2015; Nuffield Council, 2011). Answering the motivational question – Why do people donate blood? – also carries implications for the type of interventions we choose to adopt (Nuffield Council, 2011). For example, if blood donation is motivated by pure altruism (i.e., helping another, at a personal cost, without personal gain), are we justified in using interventions that directly benefit the donor (financial incentives) or highlight benefits to the donor (i.e., highlighting personal emotional rewards)? In this paper I describe the mechanisms of altruism (MOA) approach which helps to answer, in a theoretically systematic way, the question: Why do people donate blood?, The MOA approach draws on insights from the biology, economics and psychology of altruism to identify the key mechanisms that can be used to describe the motivations of blood donors and ultimately inform interventions. Box 1 provides a brief summary of what the review and what the MOA approach adds to the existing literature.

## Blood Donation and Mechanisms of Altruism (MOA)

Can blood donation be described as an altruistic act? The answer is broadly *yes***.** The, act of blood donation conforms to all the main criteria for altruism, as defined in the social sciences (Ferguson & Lawrence, 2015). It is voluntary, benefits another in need and is costly to the donor (Steinberg, 2010). Furthermore, the vast majority of donors cite pure altruistic/humanitarian as their main motivation for donating (Bednall & Bove, 2011). However, while a behaviour, such as blood donation, may appear altruistic, it may actually be selfishly motivated (Milinski, Semmann & Krambeck, 2002). Thus we need theoretical framework in which to understand blood donor motivations, and the MOA approach provides one such framework.

Across a wide variety of disciplines (e.g., psychology, economics, biology, sociology, and philosophy) a number of MOA have been proposed to explain the survival of altruism in the population, (Andreoni, 1990; Batson, 1991; Fehr & Fischbacher, 2004a-b; Nowak, 2006). However, this theoretically rich vein of research has rarely been brought to bear directly and systematically on the study of blood donor motivations (Ferguson et al., 2008). Below I briefly describe the different MOA that have been proposed and explore their implications for blood donor behaviour.

### MOA: Biological altruism, behavioural altruism and psychological altruism

A useful framework to organize the literature on MOA distinguishes (1) biological (B-altruism), (2) behavioural ($\beta$-altruism) and (3) psychological ($\psi$-altruism) altruism (Clavien & Klein, 2010).

Biological altruism refers to Darwinian fitness, where the long-term survival and fecundity of the recipient is achieved at a cost to the 'altruist' (Sober & Wilson, 1998). Indeed, products arising from blood donation, may bestow such long term survival for some recipients. *β*-altruism refers to people's performance on economic games. These games examine how people allocate resources (usually money) between themselves and others. The pattern of allocations is used to infer MOA which are referred to as pro-social/other-regarding preferences in the economics literature. Table 1 describes the basic games and the standard findings. Table 1 also acts as a reference to these methods for those interested in applying the MOA approach to the study of blood donor motivations. Finally, $\psi$-altruism examines people's expressed motivations to act altruistically (Batson, 1991).  I will examine B-, $\beta$- and $\psi$-altruism separately and explore their implication for understanding altruistic blood donor behaviour.

**Biological MOA and Blood donation**

From an evolutionary perspective a number of MOAs have been suggested to address the paradox of altruism: how does a costly behaviour, that benefits another, survive in the population (Nowak, 2006)? These MOAs and their relevance to understanding blood donor motivations are detailed in Table 2 and discussed below.

**Reciprocity**. The general concept of *reciprocity* can be used to group a set of these MOA: direct, indirect, and strong reciprocity (Nowak & Sigmund, 2005; Nowak, 2006). *Direct reciprocity* requires directly repaying help received (Nowak, 2006). As blood donors and recipients are anonymous, and never meet, donors cannot be motivated by direct repayment.

*Indirect reciprocity* comes in two forms: (1) *downstream* and (2) *upstream* (Nowak & Sigmund, 2005) (see Tables 2 & 3) .The role of downstream and upstream indirect reciprocity depends on whether the source of the reciprocation is the donor or the blood transfusion service (BTS) (Table 3)

*Downstream indirect reciprocity* functions via reputation building (Nowak & Sigmund, 2005), with those who develop a good reputation more likely to be helped by others (Milinski et al., 2002). Indeed, blood donation is viewed by others as an act that signals the donors good reputation as an altruistic person (Lyle, Smith & Sullivan, 2009). More specifically, the act of blood donation has been characterized as a *costly signal* for altruism (Lyle et al., 2009). Costly signals indicate costs (e.g., energy, time, pain) or attributes (e.g., altruism) that are not fakable, as the organism sustains the cost of the signal without detriment. Importantly, this signals an organisms value as a mate relative to others who cannot sustain such a cost (Zahavi, 1977). Thus, if reputation building is a key MOA for the donor (Table 3: Cell A) signalling to others you are a blood donor would be a powerful

signal (Zollman, Bergstrom, & Huttegger, 2013). However, evidence shows that donors rarely talk to others about their donor status (Ferguson & Chandler, 1995). However, this study was small scale and described how often donor's talk about their donor behaviour. Costly signalling theory (CST) suggests we need ask not *how often* people display a costly signal but *who* is most likely to signal and *when*. Applied to blood donors, CST suggests that donors should be more likely to communicate about being a donor when they are childless and in their reproductive years. Thus, it remains to be seen if reputation building is part of the motivation framework of blood donors. There is also another way in which downstream indirect reciprocity may work to foster donor recruitment. That is, when a friend/relative of a person who has benefited from a blood donation becomes a donor to repay their gratitude to the transfusion service (Cell B, Table 3).

*Upstream indirect reciprocity* occurs when the person receiving help goes on to help a different individual (Nowak & Sigmund, 2005) (Table 2). It is argued that gratitude arising from being helped motivates helping others (Nowak & Sigmund, 2005)[1]. Upstream indirect reciprocity is unlikely to function as a mechanism for recruiting blood donors, as a recipient of blood is unlikely to be able to go on and donate blood (Cell C, Table 3). However, the recipient may feel gratitude to the transfusion service and persuade others to donate (Cell D).

*Strong reciprocity* is '… a willingness to sacrifice resources for rewarding fair and punishing unfair behavior *even if this is costly and provides neither present nor future material rewards for the reciprocator*' (Fehr, Fischbacher & Gatcher, 2002: p 2: their italics). Thus helping is conditional on the perceived positive reputation of the recipient, but crucially not on a future reward from the recipient. Strong reciprocation could motivate blood donors as they (1) do not expect a future reward, and (2) are likely to perceive both the recipient of

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[1] Helping does not always result in gratitude in the recipient. A sense of indebtedness may also ensue, in what is referred to as the 'tyranny of the gift' (Mauss, 1990) and people may actively avoid being helped or retaliate against their helper (Ma, Tunney & Ferguson, 2014)

blood and the transfusion service as deserving. This would also imply, however, that the blood donors would be more likely to punish unfair behavior, than non-donors.

**Kin Selection**. *Kin selection* is predicated on the proposal that the degree of helping is proportional to the degree of genetic relatedness, with individuals preferentially helping kin over non-kin (Nowak, 2006). Although reported by blood donors as a motivation (Kuruvatti, Prasad, Williams, Harrison, & Jones, 2011), kinship cannot sustain donation since blood cannot be donated directly to relatives.

## Behavioural (*β*) Altruism

A number of MOA have been identified in terms of peoples' patterns of responses on economic games (see Table 1). These are discussed below in relation to blood donation.

**Pure Altruism**. The degree of pure altruism (a direct concern for the welfare of the recipient) may be inferred from responses to the dictator game (DG). In a DG (Table 1) the rational response, is to donate nothing, in an anonymous context with no negative consequences for not giving. This maximizes the dictator's payoff. Any positive amount donated indicates degrees of altruism.[2].

**Warm-Glow.** In terms of a pure altruism, the person should only be interested in the recipient (individual or organization) receiving sufficient allocations to meet their needs. However, people continue to give, even when external agencies provide sufficient resources to the recipient. This causes the individual donor's donations to make no difference to the recipient (Andreoni, 1990). To explain this, Andreoni (1990) suggests that people gain extra utility from the act of giving itself – the 'warm glow' of giving. Combining warm-glow and pure altruism results in *impure altruism:* the individual donates to attain warm-glow and

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[2] However, others has questioned that allocation in a standard dictator game reflect solely altruistic preferences (Camerer & Thaler, 1995).

benefit others simultaneously. Fong (2007) characterizes warm-glow as an unconditional motivation for helping, as it is unrelated to the characteristics of the recipient. As blood donors never know the recipient, the unconditionality of warm glow makes this a probable key motivation for blood donors.

It can be argued that Andreoni's (1990) conceptualization of warm-glow suggests it can be both (1) *experienced* at the time of giving as well as (2) *anticipated* (Ferguson & Flynn, 2015). Indeed, the "Donor Identity Survey', based on self-determination theory, identifies a factor called 'intrinsic regulation' that reflects, to an extent, aspects of anticipated warm-glown (e.g., item: "I enjoy donating blood") (France, Kawalsky, France, Himawan, Kessler & Shaz, 2014).

Warm-glow, both experienced and anticipated, has implications for blood donor recruitment and retention. If we consider blood donor motivations as a phenotype, then theoretical models of *environment-phenotype* matching (i.e., people seek out environments that match their phenotype) suggest that donors will seek out environments that match their motivations (Dickens & Flynn, 2001). There is some evidence to support this in general (Davis, Mitchell, Hall, Lothert, Snapp & Meyer, 1999). People who have a stronger preference for anticipated warm-glow, for example, should prefer contexts where they can experience more warm-glow. Donating blood may be classified as a behaviour affording a high potential for warm-glow, as it is both worthy as well as high cost. Therefore, making a successful donation should be emotionally very rewarding. A potential donor, motivated primarily by warm-glow, may seek out contexts that provides maximum warm-glow and therefore, be attracted to blood donation.

Anticipated and experienced warm-glow are linked, and this linkage may alter the motivation itself (Ferguson, Heckman & Corr, 2012). That is, if the anticipation and

experience of high levels of warm-glow are matched or exceeded, positive reinforcement is likely to occur and the donor may become addicted to donation: 'a warm-glow junkie' (Piliavin & Callero, 1991). This would result in donors with a strong preference for warm-glow self-selection to remain as donors. It may even be that over time these donors come to require "extra" warm-glow (see Charitable Incentives section below). However, when the level of experienced warm-glow does not match the anticipation of high warm-glow, retention may be low.

**Conditional Cooperation.** Conditional cooperation is observed when a person is aware of the average contributions of others in a public goods game (see Table 1) and matches that contribution in a linear fashion, but gives slightly less (Fehr & Fischbacher, 2004b). A stylised graph of a typical conditional cooperation function is given in Figure 1. The fact that conditional cooperators do not match others' contribution exactly shows some degree of self-interest. In experimental studies approximately 50% of the samples are classified as conditional cooperators (Fehr & Fischbacher, 2004b). Are samples of blood donors similarly made up of 50% conditional cooperators, or are donor samples more or less likely to contain conditional co-operators? If blood donor samples consist of at least 50% conditional cooperators the manner in which information on normative donor behaviour is presented is crucial. For example, focusing on the *number of donors* rather than the *donation rate* will be problematic and potentially lead to a reduction in donor recruitment and retention. Telling donors, who are conditional cooperators, that the number of active donors is low, informs them that they do not need to donate. However, telling conditional cooperating donors about the average rate of donation (i.e. 'Donors in your donor centre donate 3 times a year on average') may motivate them to adopt this rate. Thus, we need to explore what percentage of blood donors are conditional cooperators.

**Equality and Fairness Norms.** Norms of equality suggest that people are averse to inequality between themselves and others and thus motivated to *reduce any inequality* (Fehr & Schmidt, 1999). Inequality is *advantageous* if you are better off than others. This results in feelings of guilt, and reducing the inequality is one way to reduce the adverse feelings of guilt. The healthy donor is by definition better off than potential recipients. Thus, this leads to the suggestion that maybe blood donors could be motivated by guilt. Consistent with this, the 'Donor Identity Survey' identifies a factor called 'introjected regulation' that reflects this idea of guilt driven advantageous inequality aversion as a motivation for blood donors (e.g., item: "I would feel guilty or ashamed of myself if I did not donate blood") (France, Kawalsky, France, Himawan, Kessler & Shaz, 2014).

Norms fairness (Fehr & Schmidt, 1999) can be further identified via 3rd party punishment games (Fehr & Fischbacher, 2004a), dictator game (DG) allocations and rejection rates in ultimatum games (Ferguson, Maltby, Bibby & Lawrence, 2014). In the 3rd party punishment game, the 3rd party, is not involved in the actual exchange between players. However, the 3rd party can choose to pay, at a personal cost, to punish players who transgress. As 3rd party punishers would maximize their payoff by not punishing, this behaviour is believed to reflect enforcing norms of fairness (Fehr & Fischbacher, 2004a & b). Similarly in the ultimatum game, the recipient is always better off if they accept any offer. However, as offers become increasingly unfair, recipients reject at higher rates and both the proposer and recipient receive nothing. One possibility is that the recipient is signalling disapproval to the proposer, to encourage them to act more fairly in future interactions (Ferguson et al., 2014). Thus we could ask if blood donors have stronger norms of fairness and inequality aversion.

**Psychological (ψ) Altruism**

Psychological research focuses primarily on identifying the motivations people express for their altruistic acts.

**Pure Altruism and Negative State Relief**. Similar to economics, a *pure altruistic* motivation reflects an ultimate desire to reduce others' suffering, at a personal cost, without any personal benefit (Batson, 1991). An alternative proposal suggests that people help primarily to relieve their own negative mood, arising from observing or imagining another in need, rather than reduce others' suffering (Cialdini, Schalle, Houlihan, Arps, Fultz & Beaman, 1987).

**Reluctant altruism.** Studies of conditional cooperation (Figure 1) show that free riding occurs at a high rate (approximately 30%). For blood donation this is much higher at about 96% (Abasolo & Tsuchiya, 2014). Thus, research has focused on identifying mechanisms to reduce free-riding and increase cooperation. Dominant among these is 2$^{nd}$ party punishment (Fehr & Fischbacher, 2004a: see Table 1). That is, when people have the provision to identify and punish free-riders, cooperation rates rise. Anger is believed to motivate punishment and fear of punishment to motivate reductions in free-riding, even if punishment is merely threatened (Skatova & Ferguson, 2013). The standard account, therefore, is that anger directs punishment at free-riders to promote cooperation. However, Ferguson, Atsma, de Kort and Veldhuizen, (2012b) identified a pattern of motivation in blood donors that is the opposite of this standard account. They termed this *reluctant altruism*.

Reluctant altruism represents a preference for helping rather than punishing, when faced with free-riding. This is founded on two mechanisms that run directly opposite to the standard accounts. First, *reduced* trust in others' willingness to cooperate is linked to *increased* cooperation. The standard account indicates that *increased* trust is linked to

*increased* cooperation (Balliet & van Lange, 2012). Second, the negative emotions directed towards free-riding, as well as resulting from a lack of trust in others (Dunn & Scheitzer, 2005), are instead directed towards energizing helping rather than punishment. This indicates that the reluctant altruists should (1) persist in helping as long as free-riding is high and (2) want to reduce levels of free-riding by 'inspiring' others to help. As levels of free-riding are constantly high for blood donation, reluctant altruist should persist as blood donors and be more likely to evangelise about blood donation to try inspire and recruit others donors.

The third pattern of responses observed in the conditional cooperation experiments is referred to as the 'humped' distribution (Figure 1) and has received little discussion (Fehr & Fischbacher, 2004b). However, this may be a behavioural signature of reluctant altruists. The 'humped' responder shows a proportional increase in cooperation when others cooperate, on average, below 50%. Once average levels of cooperation in others increases above 50%, 'humped' responders reduce their cooperation in a proportionally inverse fashion. Thus 'humped' responders help when free-riding is high, but reduce helping once cooperation becomes the norm. As reluctant altruists are hypothesised to help preferentially when others are not trusted to help and help less when others' helping is established, the humped shape conforms behaviourally to the definition of a reluctant altruists. Ideally, for a reluctant altruist signature, the level of cooperation given by reluctant altruists should be above the line of proportionality when others' cooperation is low.

## MOA and Donor's Self-Reported Motivations

Above a number of motivation for altruistic acts have been identified that may be relevant to blood donation. However, are these represented in the way in which donor motivations have been assessed?

In terms of psychometric scales, the self-reported altruism (SRA) scale (Rushton, Chrijohn & Fekken, 1981) has been used predominantly to examine *general trait altruism* in blood donor (Otto & Boole, 2011; Steele, Schreiber, Guiltinan, Nass, Glynn, Wright, Kessler, Schlumpf, Tu, Smoyh & Garratty, 2008; Schlumpf, Glynn, Schreiber, Wright, Steele, Tu, Hermansen Higgins, Garratty, & Murphy, 2008). However, the evidence shows that the SRA does not predict actual blood donation (Schlumpf et al., 2008). There are a number of reasons why the SRA may not predict in the context of blood donation. First, The SRA assesses a general trait towards low cost helping (example item: "Given directions to a stranger"), while blood donation is a high cost behaviour. Second the SRA does not assess specific MOA that are pertinent to blood donation. To address these issues, Evans and Ferguson (2014) developed an index of blood donor motivations based on the MOA pertinent to blood donation (appendix A). Furthermore, in terms of traits it may be the case, for repeat prosocial acts like blood donation), that conscientiousness which represents being organized and methodical, rather than altruism, is more important and predictive (Ferguson, 2004, 2013).

Rather than examining responses to pre-defined questionnaire items, like the SRA, we can ask people to freely describe what motivations them to donate blood. Bednall and Bove (2011) reviewing this literature showed that prosocial motivations (altruism, collectivism) dominate. Donors also express motivations based on indirect reciprocity and warm-glow (they termed these intrinsic motivations). Their coding frame, as well as the coding frames of others, have not been set within a MOA approach. So to examine the extent to which expressed motivations match with MOA, I examined data from a survey of 309 blood donors across both fixed (N = 215: 137 females, 75 males, 3 missing; mean age = 23, range = 18-57) and mobile sites (n = 94: 49 females, 43 males; mean age of 34.1, range 18 - 66) which was part of a larger study (Ferguson, Singh & Cunningham-Snell., 1997). Donors were asked: "In the space below please list as many reasons you have for deciding to give blood today". Free

responses were content analysed for manifest categories by two raters (blind to the research

hypotheses) who took half of the questionnaires each and analysed them for common themes.

The resultant coding frame was applied to all the questionnaires.

34 reasons for donation were identified (inter-rater agreement = 93%) and a sub-group

were categorized into six MOA: 'altruism', 'indirect reciprocity', 'warm-glow', 'self-

interest', 'reluctant altruism' and 'advantageous inequality aversion' (See Table 4). The other

reasons were categorized either as miscellaneous motivations, interventions or the blood

donation context. People could freely respond by mentioning more than one reason. An

overall summed score was calculated for each of the 6 MOA. For example, 'altruism' has 3

associated reasons for donating. So any individual could score between 0 (not altruistic) to 3

(strongly altruistic). In total, across the 309 participants, the 6 MOA were mentioned 426

times. Figure 2 indicates the percentage (out of 426) that each MOA is mentioned.

'Altruism', 'indirect reciprocity' and 'reluctant altruism' are mentioned with the highest

frequency. Thus MOA are present in donors reported motivations, but do any of these predict

actual donation.

## Combining β- and ψ-Altruism: Saintly Sinners and Warm-Glow Givers

Both ψ-altruism (self-reported motives) and $\beta$-altruism (behaviour indicators of pro-

social preferences) have their strengths and weaknesses: (1) self-reported motivations can be

biased in terms of presenting a socially desirable image (Bednall & Bove, 2011) and (2) pro-

social preferences may represent a number of alternative underlying motivations (Camerer &

Thaler, 1995). Therefore, to identify the MOA underlying blood donation converging

evidence across ψ- and $\beta$-altruism is needed. To what extent has this been shown?

**Saintly Sinners and Warm Glow Givers** A number of the theoretically derived

motivations for blood donation (pure altruism, warm-glow, strong reciprocity, conditional

cooperation, fairness enforcement) can be identified behaviourally and cross validated

psychometrically. In the only series of studies to apply β-altruism methods to blood donation,

Ferguson et al. (2012a) compared blood donors and non-blood donors on variants of the

dictator game (Table 1) – the charity dictator game (CDG). This was used to assess altruism

and warm-glow giving. The CDG is proposed as a more ecologically valid index of altruism

(Eckel & Grossman, 1996). The structure of the basic CDG is shown in Figure 3. Participants

have to decide how much ("some, none or all") of an endowment (£2 in 20p pieces) to donate

to a charity of their choice. In a second study participants were presented with an ID card

from a charity collector, who was collecting on behalf of a specific charity and decide how

much of £2 in 20p pieces to donate to that charity. A final variant of the CDG, developed by

Crumpler and Grossman (2008), was used to assess warm-glow (WG-CDG). The WG-CDG

game is shown in Figure 3. Participants choose to donate some, none or all of their

endowment - £2 in 20p pieces – to a charity of their choice. However, in this variant the

donation results in no financial benefit to the charity. The participant is informed that the

charity already has been given £2, by the experimenter, and that any money the participant

donates to their chosen charity the experimenter will take the equivalent amount from the £2

the experimenter has allocated to that charity. If the participant donates 40p, the experimenter

removes 40p from their £2 allocation to that charity. The charity will always have £2

regardless of what the participant donates. As the participant's donation is of no financial

benefit to the charity, the only motivation for donation is 'warm-glow'. In all three

experiments the donation decisions are real, as participant are aware that they keep what they

choose not to donate and the charity is sent whatever they choose to donate or sent £2

regardless of what they donated in the WG-CDG..

The pattern of results across these three experiments was very informative (Figure 4).

In the two variants of the standard CDG, while both groups were generous, blood donors

gave significantly less than non-donors. This reflects what may be referred to 'saintly sinning' (Sachdeva, Iliev & Medin, 2009). A person who defines themselves as good – the blood donor – feels that they may have some 'moral licence' to behave less pro-socially due to an accumulation of moral currency. A complete reversal, however, is observed in the WG-CDG. Again while both groups are generous, blood donors are now more generous than non-donors. The simple change in the focus of the CDG alters how blood donors choose to donate, suggesting that blood donors are driven to help by warm-glow. These behavioural data resonate with psychometric field data, where expressed preferences for personal benefit and warm-glow predicts both behavioural intentions to donate in *experienced blood donors* (Ferguson et al., 2012b) and actual attendance to donate (Ferguson et al., 2008).

**Strong Reciprocity** Ferguson et al. (2012a) also showed that, consistent with strong reciprocity theory, participants were more likely to reward fair behavior and punish free-riding. However, this pattern was observed equally for blood donors and non-donors. Thus blood donors are no more likely to be strong reciprocators than non-donors.

## Psychometrics: Reluctant Altruism

Ferguson et al (2012b) showed that reluctant altruism emerged as a factor predicting intentions to donate for first time and novice donors (up to 3 previous donations) but not experienced donors. However, the reluctant altruist should persist as a donor, as the free-riding in blood donation remains high. Warm-glow should kick in as a motivator as the donor becomes more experienced, with the warm-glow donor self-selecting to remain as a donor. The index of donor motivations developed by Evans and Ferguson (2014) identified a reluctant altruism factor that correlated with warm-glow and donation intentions in donors and non-donors.

**Implications for Research and Interventions**

If blood donors are classified as saintly sinning, warm-glow giving, reluctant altruists what are the implications of this and the other MOA for research and interventions? Table 5 lists each of the MOA and the novel research questions and intervention implications of each.

**Research**

A number of new research questions and hypotheses are suggested by the MOA approach. These are summarized in Table 5. Key among these are self-selection effects. Self-selection suggests that those donors with a higher preferences for warm-glow should be both attracted to blood donation and more likely to remain as donors. Reluctant altruists should be attracted to be new donors and remain as donors especially if their warm-glow preference is high.

What percentage of blood donor are conditional cooperators? This unanswered question has clear implications for interventions that focus on the normative information. It is hypothesises that if blood donors are conditional cooperators, then interventions that focus on the number of donors would be ineffective and those that focus on the donation rates should be effective.

**Interventions**

Three driving criteria need to be considered when discuss the efficacy of intervention design. First, they are theory based (Abraham & Michie, 2008; Ferguson, France, Abraham, Ditto & Sheeran, 2007). Second, there needs to be congruency between the intervention focus and the prevailing motivations of the recipient (e.g., Clary et al., 1998). Third, the Nuffield Council (2011) suggests that the interventions we choose have implications for the sort of society we wish to live in. Interventions that do not reflect societal values may not be

accepted. With these criteria in mind, I will look at interventions that focus either directly (e.g., warm-glow) or indirectly (e.g. financial/charitable incentives) on MOA.

**Warm-Glow**

Below I describe the implication of warm-glow preference for intervention design.

**Pure Altruism vs Warm-Glow Interventions.** As empirical evidence shows that blood donors are warm-glow givers, then it maybe ethically justified to highlight personal benefits of blood donation (Nuffield Cuncil, 2011). Furthermore, this implies that interventions that focus on pure altruism ('save a life') may not be as effective as warm glow interventions. Ferguson et al. (2008) compared a warm-glow message (e.g., "By donating blood you may feel pleased, fulfilled, contented, and proud of yourself") with a pure altruism message (e.g., "By donating blood you are helping to treat patients recovering from diseases such as leukaemia, cancer, sickle cell disease, and thalassemia"), and showed that the warm-glow message increased willingness to donate blood in committed donors.

However, a recent meta-analysis suggests that altruism focused interventions can be effective (Godin, Vezina-Im, Bedlanger-Gravel & Amireault, 2010). However, examining 3 of the 4 altruism interventions, in the meta-analysis, suggests that they may not be assessing pure altruism. The study reported by Paulhus, Shaffer and Downing (1977) focused on the donor's good will to support their community, which may represent societal duty rather than altruism. Social duty is more akin to moral norms which predict donor intentions (Bednall, Bove, Cheetham & Murray, 2013). Similarly, Ferrari and Leippe (1992) emphasised moral norms and civil duty. Reich, Roberts, Laabs, Chinn, McEvoy, Hirschler and Murphy (2006) manipulated empathy rather than altruism, and the mechanism here may be warm glow arising from empathy (Ferguson, 2015). Thus, it is unclear that these studies actually manipulated pure altruism and none contrasted it directly with warm-glow.

**Charitable Incentivization.** The possible benefits of charity-based financial incentives for blood donation have been proposed (Sass, 2013). Here the donor receives cash for donating blood that they can donate to another charity. This intervention may work by providing the opportunity to gain *extra warm-glow*. If blood donation is not charitable enough, to generate the full amount of warm-glow the donor wants, than extra 'warm-glow' potentially comes from the opportunity to help a second health based philanthropic cause (Martin, 2013). This may have real appeal for the warm-glow motivated blood donor. In terms of the societal values can we justify such incentives? As blood donors are likely warm-glow givers rather than pure altruists, and this type of intervention leads to additional societal benefits, I feel such interventions are justifiable. Indeed, the Nuffield Council (2011) observes that "… In circumstances where altruism does not play a central role, there appears to be much less justification for avoiding the use of financial reward as a form of recognition (p 14)". Furthermore, as MAO approach so far suggests that, in fact, blood donation is not motivated primarily be pure altruism then a wider range of incentives, including financial ones is justifiable.

## The Reluctant Altruist

What are the implications of reluctant altruism in the donor pool for intervention design? These are detailed below.

**Financial Incentives, Gifts and Lotteries**: Titmuss (1971) famously stated that financial incentives would lead to a reduction in both donor numbers and the quality of blood, by crowding out intrinsic motivation. However, the effectiveness of financial incentives to enhance blood donor recruitment, while not reducing blood safety, has received strong empirical support (Lacetera, Macis & Slonim, 2013). For example, in a large-scale field based experiment, of approximately 100,000 donors, Lacetera, Macis and Slonim (2014)

showed that donor attendance was proportional to the level of incentive (a gift card for various shops) offered. Similarly, Goette and Stutzer (2008) showed that lottery tickets increased donation rates. However, it must be noted that these financial incentives are in the form of lottery tickets and gifts vouchers and not direct payment. Lacetera, Macis and Slonim (2013) have pointed out that framing incentives as 'gifts' rather than 'payment' may be crucial to the effectiveness of incentives with Steinberg (2010) suggesting that the incentive should be 'trivial' relative to the discomfort of the act of donation.

These incentivized effects for 'gifts' may, in part, reflect the idea that the blood donor pool contains reluctant altruists. If free-riding remains high, even when a 'gift' is offered, the reluctant altruists should be more motivated to help. That is, if people still cannot be trusted to help, even when they get something in return, the reluctant altruist should be more determined to help and inspire others to donate (see Table 5).

If reluctant altruists are more motivated to help when incentives do not lead to a reduction in free-riding, what about warm-glow? If warm-glow is considered an *intrinsic* motivation, incentives should act to undermine it, leading to a reduced donation rate. However, warm-glow, in the context of blood donation, is linked to helping the community (Evans & Ferguson, 2014), so also has an other-regarding aspect to it and is not a pure 'selfish' motivation. Furthermore, the strength of the warm-glow in the blood donor context this likely to be a very strong and this strength reduces the likelihood of it being crowed out by a small gift voucher (Table 5).

**Voluntary Reciprocal Altruism (VRA).** VRA draws on norms of fairness and reciprocity, whereby self-interest is seen as leading to a fair and just outcome (Landry, 2006). Landry (2006) showed that VRA lead to increased intentions to be an organ donor.

VRA, as conceived by Landry (2006), is activated by a two question strategy. The first question is designed to highlight and align the concept of reciprocity and self-interest with fairness: "I would want a blood transfusion to save *my* life: YES or NO". If the responder answers YES, this highlights (1) a *personal* potential future need, and (2) to meet this need we *all* need to contribute (general *solidarity*, *reciprocity* and *fairness*). The second question asks the respondent's willingness to donate blood: "I would be willing to donate blood: YES or NO".  If they are willing to take blood, by answering 'Yes' to question 1, it is only *fair* to give blood back and thus answer YES.  Considering answering NO to this question highlights a potential harm. That is, if others also answer NO, but are still willing to accept blood, this could result in a shortage. Highlighting a potential shortage may activate reluctant altruism. That is, the potential donor questions the trustworthiness of others to act fairly and donate blood. This leads to a simple set of empirical questions: (1) Does this simple two-question strategy results in increase donations? and (2) Is VRA more effective for reluctant altruists?

**Inequality aversion**

Models of inequality aversion indicate that emphasising guilt arising from not donating ("guilt primes") may be an effective intervention (Table 5). However, Figure 2 suggests that guilt is mentioned relatively rarely by donors. Given the relative rarity of this motivation, highlighting guilt linked to not donating may put potential donors off (O'Carroll, Shepherd, Hayes & Ferguson, 2015). Further France et al (2014) report that guilt is not predictive of blood past donations when other motivations are considered simultaneously. This type of intervention also raises concerns about whether highlighting anticipated negative mood, as a means to recruit donors, is the sort of intervention we want as a society.

**Celebrating the Donor and the Recipient: A Monument to Blood Donors**

As a society we may want to afford recipients of blood the opportunity to say 'Thank you' to donors. Recipients of blood may wish to express their gratitude. However, as they are most likely unable to donate blood they have no direct means to repay blood (Table 3 Cells C & D). The idea of reciprocating a gift, is central to many MOA, and theories of the gift-exchange (Mauss, 1990). Thus, an intervention is needed that gives the recipients a potential voice, as well as celebrating the contribution of blood donors. An approach pioneered in the field of whole body donation, to have a monument to those who have donated their bodies, could be adopted (Bolt, 2012). Monuments to celebrate blood donation would not only establish a mechanism for recipients to express their gratitude, but also may inspire future donors and acknowledge as a societal valuable contribution of blood donors. Recipients could make financial donations towards the creation of monuments, thus offering a tangible means of reciprocating. Recipients could leave tokens of thanks and inspiration (flowers, narratives about how the transfusion helped etc.). These could be cited in all major towns.

**Parsimony in Theory: Implications for Theory of Planned Behaviour**

One final implication of adopting a MOA approach is parsimony of theoretical constructs applied to blood donation. Two questions are pertinent: (1) How do the constructs in other models theoretically relate to MOA? and (2) What extra predictive value do MOA add?

It is suggested in the review that a new measures of donor motivation the 'Donor Identity Survey" (France et al., 2014), may tap constructs such as advantageous inequality aversion and warm-glow. While this is a new and important index the Theory of Planned Behaviour (TPB) is the main motivation theory applied to blood donation (Bednall et al., 2013; Ferguson, 1996). TPB suggests that behaviour is predicted proximally by intentions,

with intentions predicted in turn by (1) attitudes, (2) subjective norms (i.e., people who are important to the donor approve) and (3) perceived behavioural control (PBC: i.e., Feeling able to adopt the behaviour despite possible barriers). PBC also has a direct effect on behaviour. Attitudes are further split in to affective (i.e., anticipated positive or negative emotional responses towards blood donation) and cognitive (i.e., the pros and cons of donation) (Conner, Godin, Sheeran & Germain, 2013).

In the prosocial domain two of these constructs, affective attitudes and subjective norms, overlap with warm-glow and reputation building respectively. Affective attitudes reflect anticipated feelings, both positive and negative, associated with the act of giving (Conner, et al., 2013) with the positive feelings reflecting warm-glow. There is evidence that positive affective attitudes predict blood donation (see Lemmens, Abraham, Ruiter, Veldhuizen, Dehing, Bos & Schaalma, 2008). Donating blood because others think it is a valued activity (subjective norm) may ultimately be concerned with reputation regulation – what others think of you matters.

Indices of 'altruism' have also been added to TPB. For example Lemmens et al. (2008) included an altruism index and showed that it did not add incrementally to the prediction of donor behaviour. This may be because the index was domain non-specific (example item: "Helping those in need, is a good deed"), whereas the TPB items were blood donation domain specific.

**Conclusions**

This review has highlighted that understanding blood donor behaviour, using the concept of altruism, is more complex than first appears. Adopting a MOA approach suggests that blood donors can be described as "saintly sinning, warm-glow giving, reluctant altruists", and not simply as pure altruists. The MOA approach requires moving away from over

reliance on self-report to cross-validating models with behavioural methods designed to assess MOA. The MOA suggests why, in part, certain interventions – such as financial incentives with gifts– that traditional theory has dismissed as likely ineffective, are potentially effective. The MOA suggests a number of novel interventions for donor recruitment and retention (warm-glow messages, voluntary reciprocal altruism, charitable incentives, guilt primes) that could be effective. It also highlights a societal level intervention to allow both recipients of blood to express their gratitude and publically celebrate the contribution, to society, of blood donors ('Monuments to donation'). It also highlights a series of novel research questions. Are blood donors a self-selected group, self-selecting on reluctant altruism, and in the long term on warm-glow? It highlights the dangers of using normative information in terms of donor number as an intervention and highlights the benefits of using donation rates. These and other implications of the MOA approach are summarised in Table 5.

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**Figure Legends**

Figure 1. Stylized Conditional Coopetition Function (MUS = Monetary Units). Adapted from Fehr & Fischbacher (2004b)

Figure 2. Expressed MOA for Donation

*Legend to figure 2*: These percentages represent the frequency with which each MOA is expressed out of the total of 426 times they were expressed.

Figure 3. Charity Dictator Game (A) and Warm-Glow Charity Dictator Game (B)

Figure 4. Results from the Charity Dictator Games as Described in Ferguson et al (2012b). MUS = Monetary Unit and the maximum that could be offered was 10 in all game. Error bars = standard errors.

# Appendix A: Mechanism of Altruism Index_Blood (MOAI_Blood)

*Please read the following statements and indicate how much you agree or disagree with them by circling the number that best describes your opinion.*

| I would donate blood because … | Strongly agree | | | | | | Strongly disagree |
|---|---|---|---|---|---|---|---|
| 1. I would be doing something to help others | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 2. I would want to let members of the opposite sex know I am a good, kind person | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 3. I can take time off work or lectures | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 4. I would want to show people that I am a good, kind person | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 5. I cannot trust others to donate blood | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 6. you get a free cup of tea and biscuits when you have donated blood | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 7. I would feel good about myself after donating blood | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 8. I would want to let my friends know that I am a good, kind person | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 9. other people can't donate blood, so I would have to | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 10. I believe we are responsible for helping others | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 11. if I gave blood there is more of a chance of friends receiving it if they need it | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 12. I think the world would be a better place if everyone who could, gave blood | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 13. you get a free blood test/ find out what blood type you are when you donate blood | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 14. You receive stickers, badges and pins when you have donated blood | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 15. if I gave blood there is more of a chance of family receiving it if they need it | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 16. donating blood is the right thing to do | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 17. I would feel proud by helping people | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 18. by donating blood I could save someone's life | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 19. by donating blood I can give back to the community | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 20. I believe donating blood is a personally rewarding experience | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 21. donating blood would make me feel physically good | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 22. if I gave blood I would be fulfilling my duty to society | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 23. so few other people donate blood someone has to | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 24. if I gave blood there is more of a chance of close relatives receiving it if they need it | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

*Scoring*: Impure Altruism = 1, 7, 10, 12, 16, 17, 18: Self-Regarding = 2, 3, 4, 6, 8 13, 14: Kinship = 11, 15, 24: Reluctant Altruism = 5, 9, 23: Egalitarian Warm-Glow = 19, 20, 21, 22

Box 1. What the Mechanisms of Altruism (MOA) approach adds

| **Altruism in the transfusion literature: The current state of play** |
|---|
| 1. Altruism is generally treated as a generic construct. <br> 2. Altruism is viewed as the main motivation for blood donation and as the basis for interventions and policy discussions. <br> 3. Motivations are assessed by self-report. |
| **Altruism in the transfusion literature: What MOA approach has added so far** |
| 1. The application of the MOA approach so far has: <br> • shown blood donors motivations reflect specific MOAs, with donors described as warm-glow givers (motivated to donate primarily because it makes them feel good), <br> • lead to the discovery of a new MOA: 'reluctant altruism'. Reluctant altruists are those who donate because they cannot trust to do so and try to encourage others to donate <br> • shown reluctant altruism to be a strong motivation for early career donors, <br> • suggested that blood donors are saintly sinners. |
| **Altruism in the transfusion literature: The MOA approach and future suggestions** |
| 1. The MOA suggests a number of new research themes and interventions <br> **Research** <br> • Selection-effects may be operating. Reluctant altruist should be attracted to blood donation because blood donation is characterised by high free-riding. Warm-glow givers should be attracted to blood donation, as this context maximizes experienced warm-glow. <br> • Based on costly signalling theory blood donors should communicate about their donor status maximally in their fertile years and when childless. This effect should be stronger for reluctant altruists who should be more prone to evangelise about blood donation. <br> • Conditional cooperation is a primary MOA in humans, yet we do not know what percentage of blood donors are conditional cooperators. This has important implications for norm based interventions. If blood donor samples have a large number of conditional cooperators, norm based interventions focusing on 'donor rate' may be effective, but interventions based on the 'number of donors' may not be. <br> **Interventions** <br> • Interventions should be based, directly or indirectly, on MAOs and not generic 'altruism'. <br> • A 'one-size fits all' intervention strategy will not be effective, as MOA vary across the donor career (reluctant altruism in the early stages and warm-glow later on). <br> • Interventions based on charitable incentives or voluntary reciprocal altruism, should be effective. <br> • Suggests, in part, why financial incentives (gifts/lottery tickets) have been shown to be effective. <br> • Highlights the need to consider interventions aimed at recipients as well as donor. It is suggested that building 'monuments to blood donors' will allow recipients to express their gratitude, inspire new donors and as a society allow us to celebrate the contribution of blood donors. <br> • The MOA approach suggests why certain norm focused interventions may not be effective. |

Table 1. Basic Economic Games to Assess Preferences for Cooperation, Altruism, Fairness and Norm Violations

| Games for Preferences for Cooperation, Altruism, Fairness | | |
|---|---|---|
| *Games* | *Description* | *Indexes* |
| Dictator Game | There are two players – a dictator and a recipient. The dictator has a financial endowment and can choose to transfer some, none or all to the recipient, who has nothing. The payoff for each is whatever the dictator decides. While the rational choice is to give nothing. The mean is to offer 20-30%. | Altruism |
| Trust Game | There are two players – an investor and a trustee. The investor has a financial endowment and can choose to invest some, none or all with the trustee, where the amount invested is multiplied (usually by a factor of 3 or 4). The trustee then decides how much (some, none or all) of this multiplied sum to return to the investor. | Investors behaviour index trust and the trustees reciprocity |
| Standard Public Goods Game (PGG) | Played in groups of four anonymous players. Each has an equivalent endowment (private account) and can contribute some, none, or all to a group (public) account. Whatever is contributed is summed, doubled and paid back equally to all members regardless of their initial contribution. Each person's payoff equals what they keep in their private accounts plus what is returned from the public account. The maximum payoff for the group is when everyone contributes maximally and equally. However, not contributing (free-riding) will maximize the individuals' payoff, as long as other group members contribute something. When played over a number of rounds cooperation levels start high and tend towards free-riding. | Amount given to the public account indexes cooperation |
| Prisoners Dilemma | There are two players (A and B) who simultaneously decide to cooperate (C) to benefit ($b$) the other at some cost ($c$) (be altruistic) or defect (D) by acting selfishly. If both choose D then neither gains the maximum payoff. If A chooses C and B chooses D then B gains as they have paid no cost and gain while A has paid a cost. If both choose C then both gain as long as $b > c$. | Cooperation and Defection |

Table 1 cont/d. Basic Economic Games to Assess Preferences for Cooperation, Altruism, Fairness and Norm Violations

| | Games for Preferences Punishments of Norm Violations | |
|---|---|---|
| *Games* | *Description* | *Games* |
| Public Goods Game – With Punishments | As the Standard PGG. However, there is an option to punish free riders (2nd party punishment) at a cost. Usually participant pays 1 monetary unit to punish the free-rider by 3 units. This is open to 2nd order free riding (non-punishers free-riding on others punishment). Punishment options lead to increased cooperation, but reduced efficiency (less overall resources for the group). | Punishing to enforce norms of cooperation. Potentially motivated by anger. |
| Third Party Punishment | A player who is not part of a Dictator Game, Trust Game or PGG (a third party) observes players and can punish. For example, in a Dictator Game they can choose to pay to punish the dictator (usually again at a 1:3 ratio) based on the dictators allocations | Punishing to enforce norms of fairness. Potentially motivated by anger or moral motivation |
| Ultimatum Game | Two players: a proposer and recipient. The proposer has an endowment and the recipient knows the value of that endowment. The recipient has nothing. The recipient chooses to accept or reject any offer the proposer makes. If the recipient rejects the offer both parties get nothing, if they accept both parties get the offer as proposed. Recipients are more likely to reject offers as they become increasing unfair (moving from a 50:50 share to a 90:10 - where the first figure reflects the proposers share and the second the recipients). The recipient should accept all offers as even 10% of any endowment is a better payoff than they started with (which is zero). Unlike the Dictator Game the power now resides with the recipient. | Spite, Norm of Fairness |

Table 2. Mechanism for Altruism (Solid arrows indicate helping preferentially given and dashed arrows when help is less likely to be given)
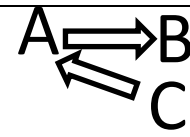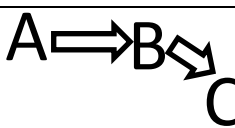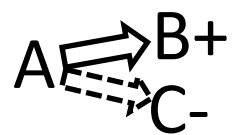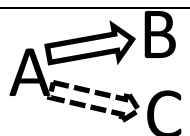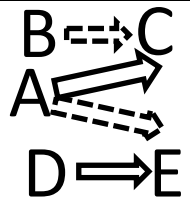
| Mechanism | | Definition | Blood Donation |
|---|---|---|---|
| Direct Reciprocity | A ⇄ B | (A) directly helps (B) who returns the favour by helping (A) at some future date. | This mechanism cannot underlie blood donation as donor and recipient never meet or interact. |
| Down Stream Indirect Reciprocity | A ⇒ B ⟸ C | (A) directly helps (B). In so doing (A) gains a positive reputation (either via the help given to (B) being observed or via gossip). Given the positive reputation (A) is more likely to be helped by others (C). | Unlikely mechanism for blood donation as donors rarely publicize they are donors, but may work if the transfusion service is the source of help (See Table 3 for more detail). |
| Up Stream Indirect Reciprocity | A ⇒ B ⇒ C | (A) directly helps (B). (B) goes on to help (C). It is suggested that (B) helps (C) due to positive affect – specifically gratitude – that (B) feel as a result of help received by (A). | This is an unlikely mechanism for blood donations as B (recipient of a transfusion) is unlikely to be able to donate (See Table 3 for more detail). |
| Strong Reciprocity | A ⇒ B+ ⇢ C- | Regardless of future reciprocation the strong reciprocator (A) will preferentially offer help to those with a good reputation (B+) and punish those with a poor reputation (C-) | Are blood donors more likely to respond positively to other's good reputation and punish transgressor? The answer is no. |
| Kin | A ⇒ B ⇢ C | (A) shows preferential helping to relatives (B) than non-relatives (C) | Unlikely to underlie blood donation as donors cannot give blood preferentially to their relatives. |
| Reluctant Altruism | B ⇢ C, A ⇒ C, A ⇢ E, D ⇒ E | Reluctant altruism is a positive response to free-riding. The reluctant altruist (A) will offer help preferentially in the context where little help is given by others (in this case helping C who receives little help from B) compared to a context where help is frequently offered (it is case where E is helped a lot by D). This is especially the case if C is a 'good cause' or has a good reputation. | Blood donation is characterized by free-riding and is a good cause. As such, blood donors should be more likely to be reluctant altruists. This is the case for first time donors. |

Table 3. The Potential Roles of Up Stream and Down Stream Indirect Reciprocity as a Function of  the Donor or Transfusion Service as the Target

| | Down Stream Indirect Reciprocity | | Up Stream Indirect Reciprocity | |
|---|---|---|---|---|
| **The Donor** | A ⟹ B<br>Donor   Recipient (stranger)<br><br>↖ C<br>Other<br><br>Cell A | Based on present data this is an unlikely mechanism for motivating blood donation as donors rarely publicize they are donors. As such, are unlikely to gain the positive reputation that attracts preferential help from others. | A ⟹ B ⟹ C<br>Donor   Recipient   Other<br><br><br>Cell C | Unlikely mechanism for motivating blood donation. The recipient (B) feels grateful to the donor (A) and helps others in some way as they cannot repay A directly. B is unlikely to help others (C) by becoming a blood donor, as those how have been transfused may not be eligible to donate. This will not have any benefit (reputation or preferential helping) for the donor (A). B may encourage others (C) to donate. |
| **The Blood Transfusion Service (BTS)** | BTS ⟹ Recipient<br>A   B<br><br>↖ ⇣ C<br>Donor<br>(Relative/<br>Friend of B)<br><br>Cell B | Potential mechanism for blood donation. The recipient of a transfusion (B) from the BTS (A), is known to a potential donor (C) (relative or friend) and therefore C reciprocates with the transfusion service by donating. | A ⟹ B ⟹ C<br>BTS   Recipient   Other<br><br><br>Cell D | The recipient (B) feels grateful to the BTS (A) but as with Cell C is unlikely to be eligible to donate blood to help others (C) |

Table 4. MOA and Self-Reported Reasons to Donate Blood

| MOA Motivation | Reasons for Donating |
|---|---|
| Altruism/Communal | 'Help others/worthwhile' (45.6%), 'Duty' (11.7%) 'Save a life' (13.3%) |
| Indirect Reciprocity | 'In case self, friends, or relations need it' (16.8%) 'Friends, Relations, I have needed blood in the past (4.2%) |
| Warm-Glow | 'Feel Good about myself' (7.6%), 'I enjoyed it, make me feel good' (7.6%) |
| Self-Interest | 'Free health check' (5/5%), , Tea and Biscuits, Stickers' (5.2%), Miss lecture/work, get drunk quicker' (3.2%), 'Overcome anxiety/challenge' (2.3%), 'Reach Target' (1.0%), 'Reduce nose bleeds (0.3%) |
| Advantageous Inequality Aversion | 'Guilty, ease conscience' (2.6%) |
| Reluctant Altruism | 'Important, Necessary, Useful and Needed' (16.2%) 'Set an example to others' (1.6%), 'Blood in short supply' (10.4%), |
| Miscellaneous | 'I wanted to' (3.6%), 'Never done it before and wanted to find out about it' (1.3%), 'So don't have to import suspect blood' (0.3%), 'Not given for a while' (1.3%), 'No reason why I should not, it's easy' (4.9%) |
| **Interventions** | |
| Direct from Transfusion service | 'Advertised' (3.2%), 'Sent a letter' (5.8%), 'Special appeal' (0.3%), 'Extra invitation, useful blood group' (4.2%) |
| Social | 'Friend and relation who are blood donors persuaded me' (10%) |
| **Context** | |
| Personal | 'Lucky to be healthy' (3.6%), 'Convenient' (5.2%), 'Free time' (6.1%). 'Regular donor' (5.5%), 'Have a dull existence' (0.3%) |
| Organizational | 'To support the BTS' (5.2%). 'Research' (0.3%) |

*Note*. Percentages are the percentage of those who reported each motivation. As people could report more than one motivation percentage add to greater than 100%

Table 5. New Research Predictions and Intervention Suggestions Derived from the MAO Approach

| MOA | Research Predictions and Questions | Interventions Suggestions and Questions |
|---|---|---|
| **Warm-Glow** | • *Selection Effect*: There should be a selection effect towards those with greater anticipated warm-glow (1) being attracted to donate blood compared to other charitable acts and (2) those with greater anticipated and congruent experienced warm-glow remaining as blood donors. That is, the proportion of warm-glow givers should increase in experienced donors. These may be described as 'warm-glow' junkies and may require warm-glow boosts.<br>• *Affordance*: Compared to other charitable acts, blood donation should be rated as more likely to generate warm-glow.<br>• *Parsimony of theory*: Affective attitudes for prosocial acts, from the Theory of Planned Behaviour, should be equivalent to warm-glow.<br>• *Crowding out*: Warm-glow associated with blood donation should not be crowded out by financial incentives. | • For following 'warm-glow' slogans have been used in campaigns in the past: 'Feel good, Give blood', 'Look good, Give blood, Feel Great'. However, these have not been systematically evaluated. As warm-glow is likely a strong motivation for blood donors, trials evaluating these slogans are needed.<br>• Charitable incentives to attract donors should be more effective for those with high levels of anticipated warm-glow, as the opportunity to donate to another health charity, contingent on donating blood, should generate an extra 'warm-glow' boost. This needs testing in a simple RCT (charitable incentive vs personal financial incentive vs personal gift voucher vs health check vs donation as usual) with experienced warm-glow assessed as the mechanism. Some work along these lines has been started by Mellstrom and Johannesson (2008). |
| **Indirect Reciprocity** | • Those who know someone who has had a successful transfusion should be more likely to donate. | • For following badge has been issued in the past: 'Be nice to me, I gave blood today'. However, its impact has not been systematically evaluated. A key question here is "Who would choose to display such badges?" Costly Signalling Theory suggested that childless donors in their reproductive years should be more likely to display such badges. Also reluctant altruists should be more likely to display such badges. |

| | | |
|---|---|---|
| | | • Monuments to Blood Donors to allow recipients an opportunity to say thank you, inspire new donors and celebrate the contribution of blood donor to society. These could be cited as a National monument as well as by region. As a simple public service intervention, these should be implemented very quickly. |
| **Costly Signals Theory (CST)** | • A basic prediction form CST is that the prevalence of communicating about being a donor (talking about blood donation, wearing a badge saying 'Be nice to me, I gave blood today') should be greatest during the fertile years and for those who are childless. | |
| **Reluctant Altruism** | • There should be a higher prevalence of reluctant altruists in first time and novice donors.<br>• Reluctant altruists who also have a higher preference for warm-glow giving should remain as blood donors.<br>• Reluctant altruists should be motivated to donate more when free-riding persists in the face of incentives such as financial gifts.<br>• Reluctant altruists should be more likely to evangelise about blood donation and recruit new donors. | • Highlighting that blood is needed and that consistently very few people donate blood should motivate the reluctant altruist to donate and to set an example to others.<br>• Voluntary Reciprocal Altruism (VRA) should increase donations by enhancing a sense of reluctant altruism. A simple RCT (comparing VRA to standard recruitment or a control arm) is needed to test the predicted effectiveness of this intervention and also if the effect of VRA is stronger for reluctant altruists.<br>• Reluctant altruists should be motivated to donate more when free-riding persists in the face of incentives. |
| **Conditional Cooperation** | • What percentage of blood donor populations are 'conditional cooperators'? This can be tested by exploring the conditional cooperation function in samples of blood donors and non-donors.<br>• Conditional cooperators will judge the number of donations to make relative to their reference group. | • Highlighting how often other donors in a donor's reference group donate per year will increase the number of donations. A simple RCT (comparing the message 'On average donors at you centre donate 2 time a year' vs a control) is needed to test this prediction. |

| Inequality Aversion | • | • Highlighting the relative resources the healthy donor has, compared to the unhealthy recipient, should generate feelings of guilt. (For example, "As a healthy person, you can give blood, and help those less healthy than you"). Feelings of guilt will drive the desire to donate. This could be tested using a simple RCT comparing the about message to a non-message or standard message control. |
| --- | --- | --- |

Fig 1
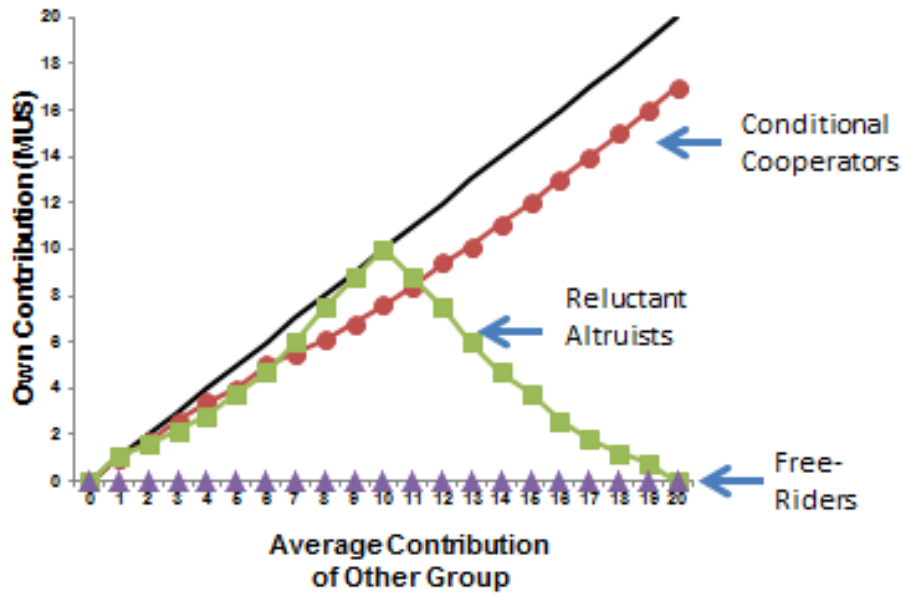


Fig 2
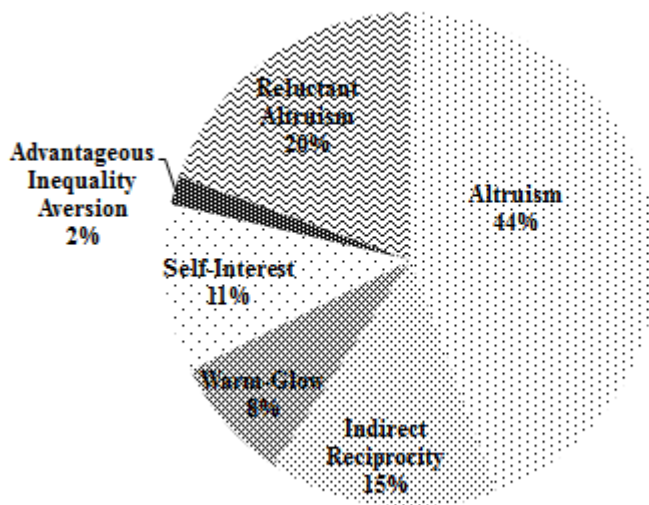
Fig 3



# (A)
# Charity Dictator Game

### Step 1: Initial Endowment
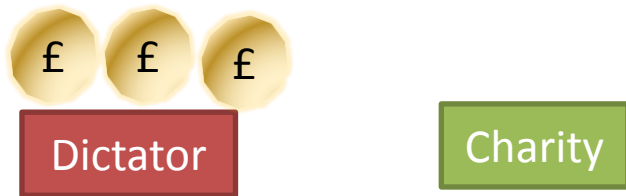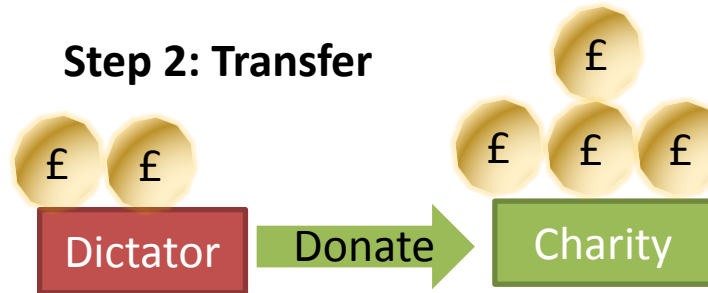
### Step 2: Final Payoff
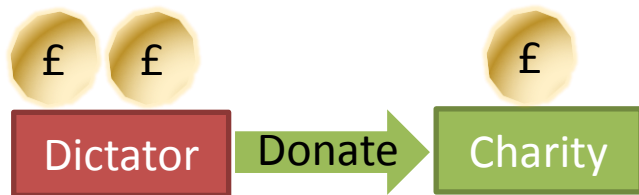
# (B)
# Warm Glow Charity Dictator Game

### Step 1: Initial Endowments

### Step 2: Transfer

### Step 3: Final Payoffs

Fig 4



**Chatity Dictator Game Results**