

What Motivates Other Regarding Behaviour? Investigating with the Dictator Game

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October 7th 2014

Statement of Candidate

I certify that the work in this thesis entitled “What Motivates Other Regarding behaviour? Investigating with the Dictator Game” has not previously been submitted for a degree nor has it been submitted as part of requirements for a degree to any other university or institution other than Macquarie University.

I also certify that the thesis is an original piece of research and it has been written by me. Any help and assistance that I have received in my research work and the preparation of the thesis itself have been appropriately acknowledged.

In addition, I certify that all information sources and literature used are indicated in the thesis.

The research presented in this thesis was approved by Macquarie University Ethics Review Committee, reference number: 5201400413 on May 6th, 2014.

A handwritten signature in black ink, reading "Matthias Oldham". The signature is written in a cursive style with a large, stylized 'O' at the end.

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7th of October, 2014

Abstract

The purpose of this thesis is to develop the existing literature on other regarding behaviour. The dictator game experiment, which is commonly interpreted as a “test for fairness”, is used as the main analytical tool. Within a general investigation of the factors motivating dictator behaviour, a specific research question is addressed. Take-option dictator game experiments have established that dictators who may take from recipients overwhelmingly do so, undermining an other regarding interpretation of their behaviour.

This thesis investigates the apparently drastic shift in behaviour through the analysis of a novel dictator game. This experiment contrasts the effect of a take option on participants facing an anonymous recipient with those facing a known charity. The economics, psychology and neuroeconomics literature are drawn upon to establish a number of factors relevant to interpreting dictator behaviour. These relevant factors are included in a post game questionnaire, responses from which are used as variables in an interval regression analysis.

It is established that a take-option effect persists with a charity recipient, but is diminished relative to the take option effect seen with an anonymous recipient. In light of the regression analysis, it is suggested that the diminished effect is the result of a greater desire on the part of dictators to act altruistically, and greater dictator confidence in the validity of the experiment. This result implies that an other regarding explanation of the take option effect is tenable, but the conclusion is tentative and further analysis is required.

Acknowledgements

Three groups of people helped me complete this thesis. The first group were my supervisors - Professors Tony Bryant and Daehoon Nahm - who readily offered their time and expertise. I cannot thank them enough. I also thank my third “unofficial” supervisor, Prof. Massimiliano Tani, for jump starting the project with his helpful advice.

The second group are my Master of Research in economics cohort, the “magnificent seven”. Being part of a group of such committed, engaged fellow students improved my productivity and made the whole process more fun. I would especially like to thank Alex Zhang, Paul Chapko and Meg Bhasin Sambyal for their invaluable contributions as research assistants for the experiment.

Finally, I would like to thank Wan Wan for supporting me with her love, and putting up all those flyers.

Contents

1	Introduction and Motivation	8
2	Literature Review	11
2.1	Introduction	11
2.2	Rational Self Interest	12
2.3	What Motivates Other Regarding Behaviour?	15
2.4	The History and Significance of the Dictator Game	37
2.5	Proposed Experiment	43
3	Methodology	45
3.1	Research Strategy	45
3.2	Research Method	48
3.3	Questionnaire Design	50
3.4	Interval Regression Analysis	58
3.5	Benefits and Limitations of Design	60
4	Analysis of Results	62
4.1	Transfer Distributions	62
4.2	Interval Regression Analysis	68
4.3	Discussion of Results	74
5	Conclusions	79
A	Experiment Documents	82
A.1	Allocation Forms	82
A.2	Questionnaire	86
A.3	Participant Consent Form	89
A.4	Table of Charities	90
B	Statistics	91
B.1	Correlation Coefficients	91
B.2	Fisher’s Exact Tests	96
B.3	Two-sample Kolmogorov-Smirnov Tests	96
B.4	Interval Regression Normality Test Output	97
B.5	Demographic Characteristics	97
B.6	Questionnaire Response Averages	98
	Bibliography	99

List of Figures

2.1	Inequity aversion equation - n person and 2 person versions. Reprinted from: Fehr, E. & Schmidt, K. M. (1999). A Theory of Fairness, Cooperation and Competition. Quarterly Journal of Economics, 114.3:822.	20
2.2	Social welfare and reciprocity equation. Reprinted from: Charness, G. & Rabin, M. (2002). Understanding social preferences with simple tests. Quarterly Journal of Economics, 117.3:822.	26
2.3	Allocation distributions in experiment 3. Reprinted from: Bardsley (2008). Dictator game giving: altruism or artefact?. Experimental Economics, 11(2), 126	39
2.4	Significant determinants of dictator transfers. Reprinted from: Engel (2011) Dictator games: A meta study. Experimental Economics, 14(4), 606	42
4.1	Percentage of participants choosing a particular transfer amount	62
4.2	Comparison of typical game transfers for session 1 (blue), List (2007) “baseline” (red) and Engels (2011) 328 treatment meta study (green)	63
4.3	Comparison of transfer distributions: session 2 (blue) and “take \$5” (red) (List 2007)	64
4.4	Comparison of transfer distributions: sessions 3 and 4	67
A.1	Sample allocation form from session 1	82
A.2	Sample allocation form from session 2	83
A.3	Sample allocation form from session 3	84
A.4	Sample allocation form from session 4	85
A.5	Questionnaire page 1	86
A.6	Questionnaire page 2	87
A.7	Questionnaire page 3	88
A.8	Participant information and consent form	89
A.9	List of 10 charities with short descriptions	90

List of Tables

2.1	Dessert decision (RS) shown in matrix form	15
2.2	Dessert decision - FS payoffs	21
2.3	Dessert decision - dynamic payoffs	22
2.4	Dessert decision - FS new payoffs	23
2.5	Dessert decision - A's reciprocity payoffs	28
3.1	Experiment Sessions	45
3.2	Select Subject Characteristics	49
4.1	Transfer Summary	63
4.2	Full Sample Regression (N=93)	69
4.3	Sessions 1 and 2 Regression (N=45)	72
4.4	Sessions 3 and 4 Regression (N=48)	73

Chapter 1

Introduction and Motivation

Other regarding behaviour is defined here as behaviour which follows from a consideration of the effects of an individuals actions on others (in monetary terms or otherwise). Such considerations produce economically important phenomena not adequately explained by income maximisation, such as charitable giving, providing an impetus for their study. In fact, the idea of explicitly incorporating such behaviour into economic analysis has a long history (Kao and Vellupillai 2013). However, in the last 20 years there has been a concerted effort to identify, quantify and model other regarding behaviour (Forsythe et al 1994, Fehr and Schmidt 1999, Engel 2011). This has generally been attempted through augmenting, rather than replacing, the neoclassical foundations of modern economics (Rabin 2002).

Since the early 1980's, a series of simple yet powerful experiments have shown that individuals do not simply maximise income in a variety of experimental situations (Osterbeek et al 2004, Engel 2011) and in field experiments (Falk 2007, Benz and Meier 2008, Franzen and Pointner 2013). However, it has not been as straightforward to show why they do not maximise income. That is, whether or not they positively value the welfare of others beyond the benefits it can accrue to them, and the costs they can avoid from considering it. This thesis investigates other regarding behaviour through one particular experiment - the dictator game. The dictator game asks each "dictator" to choose how to allocate an amount of money between themselves and a (usually anonymous) recipient.

As will be considered in much greater detail in chapters 2 and 3, the dictator game provides a double edged sword in terms of investigating potentially other regarding behaviour. It is simple to understand and implement, and it has shown beyond reasonable doubt that individuals playing the typical version do not simply maximise income (Engel 2011). However, it is not closely analogous to any “real life” situation, and participant behaviour has been shown to be quite susceptible to slight alterations in its design (List 2007, Dana et al 2007). For some researchers, this is its value. List (2007, p. 492) expresses exactly this view when arguing that “suitable manipulations” of the experiment are what allow it to generate insights into other regarding behaviour. List (2007) was concerned with showing that participant giving is strongly influenced by the choice set of the experiment. The implication of his and others research is that the main conclusion drawn from dictator game results may be erroneous. That is, while their results are not found to be significant in the only meta study of dictator games released so far (Engel 2011), they found that dictators are much closer to being income maximisers when given the option to take from recipients (achieved by giving the recipient a smaller endowment).

Their results have left an intriguing unanswered question - why is participant behaviour so strongly influenced by the so called “take-option”? This question is important because behavioural economists continue to cite the dictator game as an important piece of evidence for the contention that individuals do not purely maximise income and that in fact other regarding considerations influence interpersonal decision making (Eckel and Gintis 2010). This thesis investigates the issue from a theoretical and a empirical standpoint. However it is also concerned with more broadly investigating what motivates other regarding behaviour. This question will be addressed in the literature review (chapter 2) by drawing on literature from behavioural economics, psychology and the new field of “neuroeconomics”. A simple example of interpersonal decision making - whether or not to steal a dessert - will be used to drive an analysis of the various factors identified as influencing it.

The latter half of chapter 2 will consider the history, significance and role of the dictator game in both producing and potentially solving the take-option issue. The chapter will conclude by outlining a novel dictator game experiment conceived to help contribute to a better understanding of the take option effect, and more broadly, other regarding behaviour. This experiment will test if the take option effect persists when dictators are faced with a charity recipient. Thus it will act as a test of the strength of the effect and at the same time, the consistency of a hypothesized preference to give. Experiment sessions with an anonymous recipient will also be conducted for comparative purposes. Chapter 3 details the design and execution of the experiment. It addresses various issues involved including desired sample characteristics, experiment advertising, experiment procedure and experiment document design. Some of the information traditionally contained in a “results” chapter, such as experiment sample characteristics, are contained in chapter 3 in order to make evaluation of the degree to which different aspects of the design succeeded clearer.

Chapter 4 contains the analysis of the experiment results. It contains a comparative analysis of the results with previous, similar research (primarily List (2007)) as well as an evaluation of the degree to which the results support the hypotheses derived in chapter 2. The primary method for interpreting the data collected in the experiment is interval regression analysis. It’s coefficients, as they are interpreted as increases or decreases in the desired transfer to the recipient, are intuitive and informative. It allows for a direct test of whether there was a take option effect for the charity sessions, and other auxiliary hypotheses. Chapter 5 concludes the thesis by considering the implications of the results detailed in chapter 4 for current research in behavioural economics. It highlights the contributions of the experiment conducted in informing current debate in the discipline. It also considers how future research can develop results from the experiment to further understanding into the nature and significance of other regarding behaviour.

Chapter 2

Literature Review

2.1 Introduction

This chapter proceeds as follows. Section 2.2 outlines some important economic phenomena economic models that assume rational self interest (RS) can accurately predict and explain. Entitled “Rational self interest” it describes the domain where the predictions of RS models are supported by experimental data. Section 2.1.1 then assesses some limitations of assuming RS. It is shown that certain important economic phenomena observed “in the field” such as the existence of substantial amounts of charitable giving and income redistribution in advanced economies (as well as the degree of support for such redistribution) are not predicted or explained by RS models. Further, the strand of the behavioural economics literature concerned with using novel laboratory experiments to test the postulate of self interest is drawn upon to demonstrate that RS models tend to make erroneous predictions for a wide selection of laboratory games.

Section 2.1.2 discusses the value of modifying RS models to incorporate other regarding or “social” (preferred in behavioural economics) preferences from one theoretical point of view. Further, it is noted that participant behaviour in laboratory experiments for which RS models give erroneous predictions is broadly consistent with the predictions of economic models which incorporate some version of social preferences.

Section 2.3 and its subsections broaden the discussion, considering which factors are generally important in determining interpersonal behaviour. The contribution of various concepts found to be of some importance in predicting and explaining interpersonal behaviour in the economics and psychology literature are evaluated. These include self interest, altruism, inequity aversion, reciprocity, social norms and situational factors. Subsection 2.3.13 relates how some of these factors are central to current research into other regarding behaviour in the subdiscipline of behavioural economics.

Section 2.4 considers the value of the dictator game experiment for investigating a number of the factors covered in section 2.3, relating key research findings and current research questions. One of these contentious questions, namely why dictator behaviour is subject to a take option effect, is the basis for the experiment described in section 2.5. This section provides a overview of the experiment and the main hypothesis to be tested.

2.2 Rational Self Interest

Dawes and Thaler (1988, p. 188) posit that “much economic analysis - and virtually all game theory - starts from the assumption that people are both rational and selfish”. That is, although revealed preference theory does not require agents to be selfish (Binmore and Shaked 2010), it is operationalised in economic models by representing an individual’s utility as exclusively a positive function of their expected income. Thereby, neoclassical market theory has well predicted outcomes in competitive market situations (Smith 1962; List 2004). As Eckel and Gintis (2010, p. 110) make clear, this includes “market-type games such as double auctions, single auctions with private values, procurement contracting, and market search (Smith, 1982; Ketcham et al., 1984; Alger, 1987; Davis and Holt, 1993; Cox et al., 1996; Cox and Oaxaca, 1996, 2000; Cason and Friedman, 2003; Sobel, 2007)”.

Furthermore, in some naturally occurring competitive markets individuals appear to behave in a way consistent with the assumption of self interest being the sole motivator of behaviour, even when they exhibit evidence of other regarding behaviour in the lab (List 2006). Eckel and Gintis (2010, p. 110) summarise the situations in which the neoclassical model works well as follows:

“Neoclassical theory depicts individual choice accurately in market-like contexts involving the interaction of many mutually anonymous agents capable of forming complete, third-party enforceable contracts, so that such other-regarding objectives as fairness and reciprocity cannot be attained or have no normative standing”

2.2.1 Some Limitations of Self Interest

Models predicated on self interest fail to predict some important economic phenomena. One example is charitable giving. The sum of charitable donations from non governmental sources given to developing nations totalled U.S \$59 billion in 2013 (Hudson Institute 2013). Economic models of charitable giving exist, but they require assuming self interest in a wider sense. Andreoni’s (1990) model holds that charitable giving is motivated to some extent by the mental satisfaction or “warm glow” the giver feels from giving. This impure altruism can be argued to be something more than self interest as the satisfaction derived from it is tied to the act of giving. If the individual does not desire the good of others for its own sake, then attaining it would not produce a warm glow.

A second area where self interest alone does not give accurate predictions is median voter theory. A consequence of this theory is that the policy preferences of the median voter, who acts to maximise their own income, will preclude extensive redistribution of wealth. An empirical problem with such models is that they tend to significantly underestimate the actual level of redistribution in advanced economies (Romer and Rosenthal 1979; Milanovic 2000; Scervini 2012).

They also do not predict the extent of support for redistribution from those unlikely to benefit from it (Fong 2001, 2005). Further, the model does not adequately explain why a self interested voter would vote in the first place, given there is negligible probability their vote will alter the result of the election (Simon, 1993). Additionally, while there exists a large body of evidence supporting the conclusion that the self interest model well predicts price and quantity equilibria in double auction experimental markets with exogenously determined good quality (Davis and Holt 1993), it has also been found that when good quality is endogenously chosen, such as work effort in labour markets, the self interest equilibrium is not reached (Fehr and Fischbacher 2002).

Additionally, there is abundant experimental evidence that in situations where self interest models would predict uniform free-riding, such as a repeated public goods game, substantial amounts of co-operation occur, further, given the option to punish free-riders, very high levels of co-operation can be sustained until and including the final round of the game (Fehr and Fischbacher, 2002). A substantial amount of this punishment has been shown to be non-strategic in nature. It has also been found that contracts designed to solve the principal agent problem which assume self interest alone have unintended consequences when applied in experimental situations. Fehr and Gächter (2000) show that a labor contract without option to punish shirking elicits much higher effort levels than one with that option. Finally, self interest models predict that individual company ownership will be preferred over joint ownership, and generally results in more productive investment (Grossman and Hart 1986). However Fehr, Krehmer and Schmidt (2008) show in an experimental context joint ownership is preferred to individual ownership - although the experiment is designed such that sole ownership maximises the return to agents if all agents are self interested. 80% of players chose joint partnerships and achieved significantly higher returns on average.

2.2.2 Expanding the Domain of Economic Models

In light of the findings noted above, the question for economists is: are there any motivators other than self interest that are important for understanding and predicting economic phenomena? In all the instances listed above where the self interest prediction fails, a model motivated by self interest *and* social preferences correctly predicts outcomes while retaining the insights of the purely self interested actor model. One explanation for why this may be the case appeals to methodological individualism - “*ceteris paribus*, the more realistic our assumptions about economic actors, the better our economics” (Rabin 2002, p. 658). Rabin argues that “psychologically inspired” economics which incorporates non-self regarding preferences can replicate the correct predictions made by RS models in some domains but also widen the range of economic phenomena that can be satisfactorily explained.

2.3 What Motivates Other Regarding Behaviour?

In order to investigate the factors which influence interpersonal behaviour, consider the following choice scenario. An actor, who we arbitrarily call “Alex” (A) considers whether to appropriate or destroy a dessert, placed in the communal fridge by his flatmate “Matthias” (M). Let us first consider the situation in terms of rational self interest and present the problem in a decision matrix (Table 2.1). The dessert in question is assumed to cost \$5, and this cost is also assumed to be the subjective value that both A and M attach to the dessert.

Dessert Decision	Matthias Dessert (MD)	Matthias No Dessert (MN)
Alex Dessert (AD)	(0, 0)	(5, -5)
Alex No Dessert (AN)	(0, 0)	(0, -5)

Table 2.1: Dessert decision (RS) shown in matrix form

The payoffs in table 2.1 represent the change in wealth that occurs as a consequence of Alex's decision. They are explained as follows. In the top left cell, A takes M's dessert and replaces it, incurring a \$5 cost but also receiving a \$5 benefit. Thus his payoff is unchanged. M's payoff is also unchanged as he ultimately retains his dessert. In the top right cell, A takes M's dessert and does not replace it. In this case A derives a \$5 benefit and M incurs a \$5 cost. In the bottom left cell A does not take the dessert. He is left no worse or better off monetarily, as is M. In the bottom right cell A takes, and destroys, M's dessert. This action could be the consequence of some perceived harm that A believes M inflicted on him. Thus M is left \$5 worse off. From the matrix we can see that if A is RS, then he will choose the option (AD, MN), as it maximises his monetary reward. However there are a range of other factors which may influence A's decision (and affect interpersonal behaviour more generally). These will be explored below in terms of this example, to show intuitively the potential value of including these factors in economic analyses.

2.3.1 Altruism

Let us first consider that A may be altruistic. Altruism is here defined as an interest in other people for their own sake (Flew, 1984). An altruistic act is one in which an agent improves the welfare of another person. An agent may be motivated to consider the effect of their actions on others for purely selfish reasons - in the dessert example A may be concerned about the potential retribution he faces from M for stealing the dessert. However as anonymous charitable giving demonstrates, agents often act as if they value the welfare of others when the only plausible benefit they might receive is the satisfaction or "warm glow" of improving another's welfare. It has been argued that because of this intrinsic benefit, the consideration of the welfare of others is always to some extent selfish - since it is partly motivated by the desire to feel good. For example, Badhwar (1993) argues that altruism and self interest combine to produce other regarding acts. Her analysis of interviews with "rescuers" (people who assisted Jews during the second world war and were

awarded the designation "rescuer" by Jewish organisation Yad Vashem, as it verified they acted without expectation of material or social rewards) led her to conclude that they chose to behave altruistically in order to affirm values that form part of their identity, and were then satisfied that they did so. These actors furthered their self interest through adherence to values which promoted altruistic behaviour. Actors may also behave altruistically to change their identity - to enhance their self worth or assuage their guilt. An example is former gang members volunteering their time speak with at risk youth about the benefits of not becoming part of gangs.

Actors may also feel that acting to enhance another's welfare is "good" (rather than useful in the sense of providing extrinsic rewards) due to being convinced by others this is the case or feeling it to be the case. It seems plausible that for most people it is a mixture of both. It is taught in many homes, schools and places of religious worship that being good entails being altruistic. It has also been experimentally demonstrated that individuals have emotional reactions to situations where the welfare of others is altered (Glimcher and Fehr 2013). In the sub discipline of behavioural economics, neuroeconomics, the tools of neuroscience have been applied to attempt to relate emotional reactions in situations in which an individual may act altruistically to specific areas in the brain. These natural emotional reactions to unfair treatment may be reinforced by some societally derived value system and and it's myriad social norms. The consequence is that "pure altruism" is produced. That is, the desire to improve the welfare of others for its own sake. By contrast, an act which improves the welfare of another that is motivated by either the anticipation of intrinsic rewards (feeling better about oneself or reducing or avoiding guilt) or the desire to become a more altruistic person is not a purely altruistic act since part of the motivation is self interested. But where do the emotional reactions that produce altruistic behaviour originate? The next section explores the relationship between altruism and humankind's evolutionary past, considering the evidence for and against the proposition that our emotional intuitions have evolutionary origins.

2.3.2 Altruism and Evolution

It may not be obvious to ascribe our moral intuitions and emotional reactions to fitness considerations. However evolutionary biology provides us with at least two well established “Darwinian” mechanisms that may have led to human beings having emotional responses to actions that depend on the perceived fairness of the action. The first to be advanced was “kin altruism” (Smith 1964). This theory argues that altruistic acts (defined in the literature as acts which reduce the actors fitness but improve the recipient’s) towards family members (who share the same genes) increase their fitness and thus will lead to the propagation of individuals who exhibit kin altruism. The second, termed “reciprocal altruism” is what is commonly referred to as “enlightened self interest” (Trivers 1971). Essentially, acting reciprocally (rewarding a kindness and punishing a slight) when there is at least a long-term fitness advantage from doing will improve the actors chances of passing on their genes.

Dawkins (2006) suggests that the emotional response of actors to certain actions which do not concern their kin and which they have no stake in - such as seeing a parent hit their child in the street - is an evolutionary byproduct. The implication of this is that emotional responses to unfair actions are innate - we have some evolved sense of “right and wrong”. Dawkins (2006) points to the work of Cushman et al (2006) which involves using contrived moral dilemmas to show that most people have the same intuitive judgments of the correct resolution. These intuitions appear to be similar across societies as the moral dilemmas have been undertaken online by 160,000 subjects in 120 countries, with consistent responses regardless of age, gender, religion, or cultural background. If the evidence that individuals have a universal “moral grammar” regardless of demographics and generally experience emotional reactions to unfair actions continues to grow, it will lend more support to the social preference research agenda. If morality in an intuitive and emotional sense is hardwired in our brains then it will be a consistent, stable motivator throughout a human life.

An evolved altruism allows us to explain why a substantial portion of individuals sometimes prefer to act fairly even when there is no selfish interest (such as an enhanced reputation) or relevant social norm (experimentally derived or assumed) to motivate their action.

2.3.3 “Simple Altruism” Utility Function

Given the discussion of altruism above and the conclusion that it may be a real force in interpersonal decision making, let us assume A prefers, *ceteris paribus*, to increase the welfare of M. This motivation is termed “simple altruism” in economics, and a utility function representation for the two person case is given below, taken from Charness and Haruvy (2002):

$$U_A(\Pi) = \Pi_A + \alpha \Pi_M$$

If A is altruistic to some degree, then $\alpha > 0$. In the case where $\alpha < 1$, regardless of its precise value, A’s utility maximising choice is still to take the dessert. Thus unless A values his own payoff equally with M’s, the prediction of this model mirrors the RS prediction, in this scenario. If $\alpha = 1$, then he is indifferent between three possible options. In contrast to subsequent models we will consider, regardless of the value of alpha, A’s ranking of the payoffs implies his least preferred option is to destroy the dessert. However A, whether altruistic or not, may also have an egalitarian notion of fairness. Indeed the most well known model to come out of the behavioural economics literature is Fehr and Schmidt’s (1999) “inequity aversion” model, which attempts to explain apparently non-selfish behaviour in a set of laboratory games in terms of a desire to minimise payoff differences. The next section will outline how inequity aversion would affect A’s preferred action, and more generally how assuming that actors care about the equality of outcomes affects their predictions of individual behaviour.

2.3.4 Inequity Aversion

The most widely cited, known and debated (Binmore and Shaked 2010, Fershtman et al 2012) model of social preferences is Fehr and Schmidt's (1999) "inequity aversion" model. It was designed to try to explain the results of several laboratory games that appeared to show that participants put a positive value on more equal allocations of resources. The authors have since made it clear that they regard the model as a useful simplification but not a complete model of social preferences, and have suggested that a more complete model, while potentially not sufficiently tractable for prediction, is a worthwhile theoretical endeavor (Fehr and Schmidt 2010). Nevertheless, the inequity aversion model has a track record of predicting experimental game behaviour quite well at the aggregate level (Blanco et al 2011). The equation that defines the model is shown below.

$$(1) \quad U_i(x) = x_i - \alpha_i \frac{1}{n-1} \sum_{j \neq i} \max [x_j - x_i, 0] - \beta_i \frac{1}{n-1} \sum_{j \neq i} \max [x_i - x_j, 0],$$

where we assume that $\beta_i \leq \alpha_i$ and $0 \leq \beta_i < 1$. In the two-player case (1) simplifies to

$$(2) \quad U_i(x) = x_i - \alpha_i \max [x_j - x_i, 0] - \beta_i \max [x_i - x_j, 0], \quad i \neq j.$$

Figure 2.1: Inequity aversion equation - n person and 2 person versions. Reprinted from: Fehr, E. & Schmidt, K. M. (1999). A Theory of Fairness, Cooperation and Competition. Quarterly Journal of Economics, 114.3:822.

The model centres on two parameters - α and β . Alpha measures the individual i's dislike of unadvantageous inequality, while beta measures their dislike of advantageous inequality. When α and β are zero the model collapses to the standard, income maximising utility function. If individual's have stable distributional preferences then choosing the parameter values based on individual behaviour in one situation where these preferences would be relevant ought to allow prediction in another. In terms of A's decision, to use the Fehr and Schmidt (FS) utility function to predict his choice requires knowledge of his parameters - the degree of his dislike for positive and negative inequality. These values would either need to be derived

from his previous behaviour or assumed to equal the average behaviour of players of some experimental games involving distributional decisions - as is the case here. Assuming, as FS do, using the large body of evidence from ultimatum game experiments, that 30% of the population (of ultimatum games) have values of α equal to 1 and β equal to 0.6, and A also has these values, we can use the FS model to predict his choice regarding the dessert.

FS - A's payoffs	Matthias Dessert (MD)	Matthias No Dessert (MN)
Alex Dessert (AD)	0	-3
Alex No Dessert (AN)	0	-1

Table 2.2: Dessert decision - FS payoffs

As shown in table 2.2, Alex is now indifferent between the status quo and taking but replacing M's dessert, as both achieve equality in payoffs. Note that in the other two possible outcomes there is advantageous inequality for A. A is worst off in the situation where he takes the dessert, since the inequality in payoff's is greater (\$10) than when he simply destroys M's dessert (\$5).

2.3.5 Dynamic Effects

We have so far not considered that the choice may be influenced by issues bound up with time. Theses include the benefit to A of having the dessert now rather than later purchasing it and the cost to M if he is inconvenienced by A appropriating the dessert, even if A eventually replaces it. We may consider the payoff matrix when payoff's reflect the benefit of having the dessert now, and the possibility of being inconvenienced. This requires an assumption about A and M's discount rates. In this situation it might be assumed that M's discount rate is non-linear. That is, he may not discount at all up to a certain point (tonight's dinner), then discount mildly from that point on till the expiry date, after which the dessert has no value to

him. By contrast, A may have a very high discount rate from the present moment, either because taking the dessert was a sudden desire or because he is very hungry. It may be that he anticipates a reduction in his welfare if he does not take it. Incorporating this anticipated loss into the model is easy if we arbitrarily specify a cost equal to \$2 that represents a welfare loss from not taking the dessert. However any model that aimed to predict behaviour in situations like this *generally* would have to incorporate the individual agents perception of the welfare loss, which would require something like a wealth parameter which proxied for the agents health. Additionally, it raises the issue that A and M's subjective valuations of the dessert in terms of its characteristics may not be equivalent to its monetary cost. This complication is not addressed here, although their valuations could in theory be derived from their previous purchasing decisions or elicited directly. At the aggregate level, valuations for particular products have been estimated by looking at the effect of price changes on demand.

New Pay-offs	Matthias Dessert (MD)	Matthias No Dessert (MN)
Alex Dessert (AD)	(\$0,\$0)	(\$5,-\$5)
Alex No Dessert (AN)	(\$-2,\$0)	(\$-2,-\$5)

Table 2.3: Dessert decision - dynamic payoffs

We can see from table 2.3 that if A is RS, he will once again take the dessert. This is also the case if his preferences are captured by the simple altruism utility function. If A is egalitarian, as formulated by the inequity aversion model, his payoff's for each alternative will be as shown in table 2.4 below.

Table 2.4 shows that A's utility maximising choice is to take the dessert and later replace it. The result is contingent on A immediately replacing the dessert. The model also has the counter-intuitive prediction that A would prefer to destroy M's

FS - A's pay-offs (Beliefs)	Matthias Dessert (MD)	Matthias No Dessert (MN)
Alex Dessert (AD)	(0)	(-1)
Alex No Dessert (AN)	(-4)	(-3.8)

Table 2.4: Dessert decision - FS new payoffs

dessert rather than not take it at all. This follows from the fact that the parameter values used to calculate the inequity aversion model payoffs imply that agents are more averse to disadvantageous inequality. A second reason for this result is that A's beliefs about M have not been incorporated into the model. In the next section the concept of reciprocity is introduced. Further, an economic model of reciprocity is used to illustrate its use in modeling interpersonal interactions.

2.3.6 Reciprocity

Alex's decision regarding the fairness of his action will likely take into account his previous interaction with Matthias. Does he like Matthias? Does he consider him a person who "deserves" to lose a dessert - perhaps because of some previous slight he has inflicted on Alex. We can characterise this consideration in terms of reciprocity - punishing the unkind and rewarding the kind. Reciprocity has played an important role in the study of other regarding behaviour as it appears to strongly motivate behaviour in laboratory experiments such as the ultimatum and trust games (Oosterbeek 2004). Balliet (2011), in a meta study of experiments concerning reward and punishment, affirms the importance of reciprocity in interpersonal behaviour.

One important finding in research on reciprocity has been that participants in experiments behave reciprocally beyond what can be explained by a desire to influence future actions to their benefit. Even in one-shot games, where the participants will never meet again, reciprocity appears to play a role.

This has led some economists to define the concept of the strong reciprocator , who exhibits “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” (Fehr et al 2002).

2.3.7 Strong Reciprocity

A body of research supports the conclusion that people will exhibit ”strong reciprocity” (Gintis et al 2003), that is they will reward good intentions and punish bad intentions even at a cost to themselves. This behaviour is observed even in situations where there is no long term benefit to punishing perceived bad actions e.g. one shot experimental games such as the ultimatum game (Henrich et al 2001). Such a tendency might be explained by a sort of evolutionary overshooting (maladaptation) i.e. an established tendency to punish bad behaviour is sufficiently instinctual that it drives behaviour even when it is not “rational”. However Gintis et al (2003) show that it has been demonstrated repeatedly that individuals can distinguish between one shot situations and those likely to be repeated, and that cooperation rises with the expected frequency of future interactions (Gächter & Falk, 2002). They conclude that this is incompatible with a maladaptation explanation.

However, if the motivating factor in one shot interactions is primarily *emotional* then this would still be consistent with a maladaptation explanation. That is, since an individual's sensation of the “unfairness” of an action in a one shot situation is a byproduct of the evolutionary advantage associated with exhibiting reciprocity in repeated interactions, whether on a rational level the individual can distinguish the situation from one likely to be repeated is irrelevant. As Johnson et al (2003, p. 911) put it “kin selection, reciprocal altruism and indirect reciprocity need not explain why altruism fails to conform to rationality theory today; rather, they explain why it became ingrained in our brains in the past”.

However Boyd et al (2003) show that “strong reciprocity” may under plausible conditions be a product of the interaction between cultural and genetic evolution. Falk, Fehr, and Fischbacher (2001) show that in an ultimatum game, when responders know that the decision maker is limited to give either \$2 or \$8 from a \$10 pie, the rejection rate of low offers is reduced to almost zero. This suggests that people are far from slaves of their emotions. Since the decision makers intention can be seen as not fully selfish in this context, it does not inform us about whether or not the individual is motivated by strong reciprocity.

However, it does provide evidence against an alternative “relative fitness” hypothesis provided by Price, Cosmides, and Tooby (2002), which argues that experimental data can be explained by participants acting to avoid leaving others with a relative “fitness advantage” by, for example, rejecting low offers in the ultimatum game. While there is substantial support for strong reciprocity in an experimental context, Guala (2012) argues that strong reciprocity is not prevalent outside of the laboratory, as there is little evidence of costly punishment. Yamagishi et al (2012) argue that the interpretation of ultimatum game rejections as evidence of strong reciprocity is incorrect, as participants who reject low offers do not exhibit similar degrees of positive reciprocity. However laboratory evidence for strong reciprocity is not limited to the ultimatum game. Carpenter et al (2009) show a model of strong reciprocity predicts behaviour in a modified trust game.

Returning to the case of Alex, he may be motivated to either take or destroy the dessert from a desire for revenge. Destroying the dessert is consistent with strong reciprocity. More generally, his actions can be incorporated into an intentions based model of reciprocity. If we know that M has behaved in a way which A feels is unfair, prior to A’s consideration of the present action - then we can alter how A values M’s utility according. To be more precise, let us consider Charness and Rabin’s (2002) model.

2.3.8 Charness and Rabin's model

Charness and Rabin (2002) argue that “difference aversion” models like inequity aversion may predict the results of common experimental games well due to “the fact that in many of the games studied their predictions happen both to be the only way that subjects can depart from self-interest, and to be the same as the predictions of reciprocity.”. Charness and Rabin (2002) attempt to incorporate a more general specification of social preferences and reciprocal behaviour into a single model. They increase the number of parameters from two in the inequity aversion model to three, as can be seen from the defining equation below. π_A and π_B represent the payoff of each player.

$$U_B(\pi_A, \pi_B) \equiv (\rho \cdot r + \sigma \cdot s + \theta \cdot q) \cdot \pi_A + (1 - \rho \cdot r - \sigma \cdot s - \theta \cdot q) \cdot \pi_B,$$

where

$$\begin{aligned} r &= 1 \text{ if } \pi_B > \pi_A, \text{ and } r = 0 \text{ otherwise;} \\ s &= 1 \text{ if } \pi_B < \pi_A, \text{ and } s = 0 \text{ otherwise;} \\ q &= -1 \text{ if A has misbehaved, and } q = 0 \text{ otherwise.} \end{aligned}$$

Figure 2.2: Social welfare and reciprocity equation. Reprinted from: Charness, G. & Rabin, M. (2002). Understanding social preferences with simple tests. *Quarterly Journal of Economics*, 117.3:822.

The authors chief interest was in establishing the power of social welfare preferences and reciprocity in predicting participant behaviour. Social welfare preferences correspond to $1 \geq \rho \geq \sigma > 0$. That is, participants prefer more for themselves and the other person, but put greater weight on their own payoff when they have less than the other person. However, the model also “encapsulates variants of existing models” (Charness and Rabin 2002, p. 818) including simple altruism and inequity aversion. The authors tested the relative predictive power of the different models over a large number of games specifically designed to “test existing theories more directly” (Charness and Rabin, 2002, p. 818). The model that included the reciprocity parameter, θ , had significantly better fit, as measured by the log likelihood, than a self interest, simple altruism and “behindness aversion” model.

However, a charity model, which contains only ρ , holding the other parameters equal to zero, did almost as well. This suggests the most parsimonious social preference model may be one which says that individuals value others welfare positively when their payoff exceeds that of the other player, but not otherwise. The self interest, charity and simple altruism models all imply that having a higher absolute payoff is always better for a player, regardless of the distribution of payoffs. However the charity and simple altruism models also put positive value on the other players payoff. The difference between the two is that the charity model suggests players only care about increasing the others payoff when they have more, but not when they have less. When they have less, they only care about their own payoff. So what the model says is they will not feel better if the other players payoff is increased when they have less. However, the utility is derived from the payoffs. So what is implied is that the individual feels no satisfaction that the other player has a positive payoff, when that payoff exceeds theirs. The simple altruism model by contrast assumes (by the restriction $\rho = \sigma$) that the player values the other player's payoff equally positively regardless of whether the player receives more or less.

Both these assumptions have limitations. It seems improbable that people completely disregard the payoff of another when they receive less - it would likely depend on context. For example, if reciprocity plays a role in utility, then another player who had previously acted generously to our agent would potentially have their payoff valued positively by the agent regardless of whether their payoff exceeded the agent's. This would imply a "conditional altruism" model might do better. However the simple altruism assumption that individuals always value another's payoff positively, while it may generally be true, may not capture that individuals may also be adverse to very unequal distributions (citations). Thus while an individual may value another players payoff positively if they receive \$10 more, in a linear fashion, they may value an additional \$10 slightly less positively.

In fact they may value additional amounts less and less positively, to the point that the valuation became negative. This sort of non-linear relationship may occur even when the agent is predisposed to positively value the others payoff (due to reciprocity for example). Charness and Rabin include a more general model which incorporates non-linearity in the appendix to their paper (Charness and Rabin, 2002).

In terms of our example, let us consider how using the social welfare preference specification will affect the agents payoff's. We will use the parameters estimated by Charness and Rabin (2002). Let us assume first that A believes that M has previously acted poorly towards him, and therefore $q = -1$. Then the payoff's are as shown in table 2.5.

A's Reciprocity Payoff's	Matthias Dessert (MD)	Matthias No Dessert (MN)
Alex Dessert (AD)	(0.93)	(-0.35)
Alex No Dessert (AN)	(-1.73)	(-3.61)

Table 2.5: Dessert decision - A's reciprocity payoffs

The results are qualitatively similar to the inequity aversion model. Alex will still prefer to take and replace the dessert. However, he now receives greater utility from leaving the dessert than he does from destroying it. This reflects the fact that Charness and Rabin's estimated ρ and σ imply that Alex is moderately altruistic when he is better off than the other actor, and weakly altruistic when he is worse off. Further, the reciprocity parameter is unintuitively negative, implying that A values M's payoff more when M was previously unkind to A.

2.3.9 Emotions

Evidence from neuroeconomics suggests that different brain regions appear to moderate the degree of behaviour exhibited which can be described as other regarding. For example, Haruno and Frith (2010) found that higher levels of activity in the right amygdala after the presentation of a situation with a large absolute difference in payoffs (such as receiving 0% of the dessert you bought) predicted, at the individual level, the degree of dislike for the situation. In their experiment, 67% of participants were classified as “pro social” according to the triple dominance measure of social value orientation, which classifies individuals as either pro social, individualistic or competitive. Of the remaining 33% of participants 29% were classified as “individualistic”, and there was found to be no statistically significant relationship between their emotional reaction to a situation and its fairness - amygdala activity was slightly negatively correlated with the absolute value of the payoff difference.

The authors conclude that “pro social value orientation is driven by an intuitive aversion for the inequitable division of resources”. What this conclusion implies for Alex is that if he is a “pro social” individual, then his amygdala will cause him to feel some dislike for the outcome where he eats Matthias’s dessert, whereas if he is “individualistic” then he will feel no such emotional pull. However these sorts of conclusions which relate brain activity to emotional states have been criticised as not taking into account the broad variety of behaviours to which variations in activity in different brain regions have been linked. Anderson (2010) points out that “amygdala activity has been associated with the perception of biological motion, the detection of oddball tones, the perception of sharp contours, and framing effects in economic decisions, in addition to various other perception, memory and emotion-related functions”. Thus at this early stage in the development of neuroeconomic research on social preferences (the textbook for the field is in its second edition) claims like those made by Haruno and Frith (2010) must be treated with some caution.

2.3.10 Situational Effects

So far we have reasoned that Alex's choice is affected by his desire to eat the dessert, his beliefs about the possible reprisal of his flatmate, his evaluation of his flatmates previous actions, his abstract (culturally derived) notions regarding the importance of fairness for its own sake and whether he feels a negative sensation when considering an action that will cause an unequal payoff. To further complicate matters, let us consider the possible reputation effect of stealing the dessert. Let us specify that there are four flatmates. Alex may consider the potentially negative effect of having been identified as the thief. Of course this in turn requires an evaluation of the likelihood of this being the case which itself requires an assessment of Matthias's likely difficulty in figuring out that it was Alex who took the dessert. It further depends on the specific situation that Alex finds himself in when considering whether to take the dessert. Is he alone in the flat or are other flatmates around?

Without expanding too much it can be seen that his behaviour crucially depends on aspects of the situation, some of which are not under his control. The importance of the interaction between his individual beliefs and the situation he is part of is well explored in social psychology. It has been shown that taking account of both the individual and the situation can account for a significantly larger portion of the variance in individual behaviour across situations than a model which considers only attributes of the individual or aspects of the situation (Bowers 1973, Dworkin and Kihlstrom 1978). The individual may be influenced in several ways by aspects of the situation. Different aspects may either inhibit or encourage certain behaviours. In social psychology aspects of the situation which strongly encourage certain behaviours are known as "channel factors" (Ross and Nisbett 1991). In the motivating example above a relevant channel factor would be the absence of the other housemates, especially Matthias. In a famous experiment, Darley and Batson (1973) found that young seminarians on their way to give a talk on the parable of the good Samaritan (or another religious topic) were significantly less likely to stop

to help a shabbily dressed stranger moaning for help when they were told they were late for the talk - 63% helped in the “low” hurry condition but only 10% in the “high” hurry condition. There was no significant difference in help offered between those delivering a talk on the good Samaritan and those on another non-helping relevant topic. Situations can also *over time* shape individual identities and values e.g. by individuals internalising different environment specific social norms. Consider Akerlof and Kranton’s (2010) example of changes in smoking demographics in the United States. Early in the 20th century few women smoked cigarettes, however by the 1980’s women were smoking at similar rates to men. Akerlof and Kranton argue that changes in relative prices and income were too small to explain this trend and that a change in gender norms regarding smoking over time better explain the large shift in behaviour - from smoking being deemed “un-womanly” in the 1950’s to advertisers actively targeting the “liberated woman” of the 1970’s.

2.3.11 Social Norms

We have yet to exhaust the ingredients that shape Alex’s choice. Alex may have “culturally derived” notions about fairness. This specifically relates to his conception of fairness at an abstract level, that is, any general principles of ethical behaviour he has internalised or are emotionally intuitive. In addition to principles of action, he may have internalised rules of behaviour tied to specific situations. We might call these “social norms” or “socially appropriate” behaviour (Krupka and Weber 2008). These rules - such as “don’t steal” overlap with any personal ethical code Alex may have but are distinguished by their general adoption within the society he belongs to and by being defined over actions rather than outcomes (Elster, 1989). There is a further distinction to be made between injunctive norms which specify the permissibility of an action e.g. don’t steal, and descriptive norms, which are conventional actions e.g. thanking the bus driver.

Experimental studies such as Krupka and Weber (2008) have shown individual beliefs regarding the social appropriateness of a range of choices have significant predictive power. Krupka and Weber (2013, p. 496) purport to show individuals have “a stable preference for complying with social norms”. However other recent research such as that by Gächter et al (2013) finds that the predictive power of “social preferences” derived from previous behaviour is comparatively larger. Evidently there will be interaction between social norms and other considerations, including preferences.

For example, if there are several socially appropriate actions then other considerations, such as self interest, may govern which of them is chosen - for example, if Alex decided that Matthias would not mind if he replaced the eaten dessert then he may choose this course rather than the other appropriate action - refraining. Fehr and Schmidt (2010) argue a limitation of the social norms approach is the “complete freedom to rationalize any result ex post that is compatible with a Nash equilibrium by choosing the appropriate social norm that explains the behavior”. Social norms may drive behaviour in some situations when there is a single, strong norm but merely act as a sort of “menu” of choices that the actor considers equally viable when there are many to choose from, thus at best acting as a framing device for the actor.

The social norm elicitation method developed by Krupka and Weber (2008, 2013), by both showing what action is seen as most appropriate and then demonstrating the predictive power of “appropriateness”, gives researchers the ability to identify norms from survey choices. However, this method requires that an experiment take place to identify the appropriate norm every time a researcher wishes to predict behaviour in a novel situation. Further when there are several norms then the one shown by the survey may simply reflect a more fundamental motivator of behaviour that is being expressed through the norm.

That is, the norm is real, but reflects other motivations. Norms will vary with culture, ethnic group and religion, among other factors, so it is not simple to derive a tractable model of behaviour from norm elicitation (citation). In Alex's case, how do we get from information regarding his demographic characteristics to his choice of social norm. Perhaps we know from experimental evidence that the devout believe it to be less acceptable to steal, and we know Alex is devout. Thus the norm "don't steal" may be more likely to be chosen. However, without a specification of all relevant norms how can we know which norm Alex is predisposed to choose. Another option would be to argue that within a particular culture it has been experimentally (and/or otherwise) established that certain norms prevail, such that these can be used to predict behaviour. The influence of the norm would then need to be quantified and weighted against other considerations in order to establish whether (given the multitude of considerations involved in just the simple example of Alex's dessert decision) norms alone can provide sufficient predictive power for any compelling theory of interpersonal behaviour. Finally, this method would also require a method for deciding which norms are relevant to a situation.

2.3.12 Summary of Motivational Factors

The example used to motivate this section was chosen partially to demonstrate the complexity of modeling the decision process involved in the prediction of a simple choice. It lends intuition to the evidence from social psychology that predicting behaviour merely from individual traits is likely to capture only a moderate fraction of the total variance. Its main purpose however, was to serve as a convenient platform for exhibiting a substantial number of factors influencing individual decision making. The annotated list below summarises those factors for which there is a considerable literature within economics and other disciplines concerned with modeling interpersonal decision making. To summarise, the following factors have theoretical and or empirical support for being influential in interpersonal decision making.

Self Interest

Most economic analysis assumes that an individual wishes, *ceteris paribus*, to maximise their own income. This is a method of representing rational self interest. Further, the individual may consider how their actions will affect their relationship with others in order to maximise future income or more broadly their own utility - thus we can include reputation effects (Andreoni and Bernheim 2009) and weak reciprocity - providing aid in expectation of future rewards - in this category.

Altruism

There are various strands of evidence demonstrating that many individuals sometimes act altruistically. They may do so for a number of reasons that are not concerned purely with the welfare of other people (Elster, 2007), such as attaining the “warm glow” (Andreoni 1995) acting altruistically may provide. However, there is qualitative and quantitative evidence that concern for others, “for their own sake” (Flew 1984) does motivate some altruistic acts (Badhwar 1993).

Inequity Aversion

There is experimental (Dawes et al 2007) and societal evidence (Fong 2001) that many individuals dislike large amounts of inequality. This may explain part of the established predictive power of the inequity aversion model (Blanco et al 2011). This may also be partially due to the fact that inequity aversion may capture other motives, such as as altruism, when they align (Charness and Rabin 2002).

Reciprocity

Reciprocity is a powerful force in interpersonal behaviour (Balliet et al 2011). Further it has been demonstrated that agents appear to act reciprocally even in situations where they will derive no future benefit, such as one shot ultimatum games (Henrich et al 2001). Investigating this “strong reciprocity” has

become an active research area, although the degree of empirical support for the concept varies between the lab and the field (Guala, 2012).

Emotions

There is a substantial evidence being accumulated in neuroeconomics that supports the contention that many individuals have emotional reactions regarding the fairness of an action like eating someone else's dessert (Fehr et al 2013). If such emotional reactions are proved to be stable, widespread in the population and actually predictive of behaviour (Haruno and Frith 2011), this will provide a strong argument for modelling the social preferences that such emotions produce.

Situational Factors

Aspects of the situation both produce behaviour and interact with other relevant factors. Social psychology has well documented the importance of various factors such as time constraints and authority in affecting the degree of other regarding behaviour displayed by individuals (Darley and Batson 1973 and Milgram 1961). Further, social psychology studies have shown that a focus on individual dispositions alone, such as social preferences, has lower explanatory power than an analysis which also includes situational determinants of actions (Dworkin and Kihlstrom 1978, Ross and Nisbett 1991).

Social Norms

The individual may be influenced by generally (the relevant reference group is a contentious point) held beliefs about the, *sometimes* singularly, appropriate behaviour in a certain situation. In the example in this section "don't steal" is a relevant norm. Krupka and Weber (2008, 2013) have shown participant behaviour in the dictator game is strongly predicted by previously elicited norms about each transfer amount.

2.3.13 Motivational Factors in Behavioural Economics

The behavioural economics literature focuses on social preferences and social norms in particular, investigating the extent to which such concepts predict behaviour. Fehr and Schmidt (2010) suggest future research should aim to classify populations into “social preference types” (107), by which is meant something akin to the triple dominance model (Van Lange 1999) but focused on classifying individuals by the types of social preferences emphasised in the behavioural economics literature. Kranton et al (2013) use the finite mixture classification approach, finding their sample population could be divided into four types that were either consistently dominance seeking (corresponding to “competitive” in the triple dominance approach), fairness seeking (corresponding to “pro-social”), social welfare maximising (utilitarian or “efficient” in the sense of neoclassical economics in that total societal payoffs are maximised) or selfish (corresponding to “individualistic”).

Another approach is to focus on the influence of social norms. Krupka and Weber (2008, 2013) have developed a norm elicitation method which allows for norms to be deduced by surveying individuals on the “social appropriateness” of a range of behaviours. They show the elicited norms explain the majority of variation in behaviour for simple laboratory games (Krupka and Weber, 2013). However, another study by Gächter et al (2013) shows that hypothetical social preferences predict a greater share of the variation in play than social norms in a labour market game.

What these studies have in common is the use of the Dictator Game as a tool for detecting the influence of norms and preferences. The next section details why this particular experiment can be of value in analysing the motivations behind apparently other regarding behaviour.

2.4 The History and Significance of the Dictator Game

2.4.1 Dictators and Self Interest

The dictator game was introduced into the behavioural economics literature by Kahneman, Knetsch and Thaler (1986) as a variation of an earlier game known as the ultimatum game, first subjected to experimental analysis by Güth et al (1982). The ultimatum game involves asking participants to divide an endowment between themselves and another participant, who may reject the offered division. A meta study of 37 ultimatum game experiments by Oosterbeek et al (2004) reports that the mean division of the endowment was 40%, and the mean rejection rate of offers was 16%. The prediction of non-cooperative game theory for an ultimatum game, as outlined by Rubinstein (1982), is that the divider will offer the recipient a token amount, which they will accept.

This prediction assumes agents are rational and practice backward induction. Binmore and Shaked (2010) point out that backward induction is a controversial assumption and without it any allocation choice in the ultimatum game is an equilibrium. More generally, dropping backward induction implies a larger set of Nash equilibria for several other common experimental games. In direct response to Binmore and Shaked (2010), Eckel and Gintis (2010) assert that “it is plausible to assume that players will choose strategies that survive one or two rounds of backward induction” since they are rational, while agreeing that common knowledge of rationality i.e. Harsanyi consistency (Harsanyi, 1967) is unlikely to hold and hence complete backward induction will not occur. This position allows Eckel and Gintis to continue to characterise the neoclassical prediction as a unique sub-game perfect equilibrium in simple games like the ultimatum game.

Oosterbeek et al (2004) made clear that the unique subgame perfect equilibrium (with backward induction) predicted for the ultimatum game did not occur. The results could be speculated to derive in part from social preferences but there were still serious confounds. In order to eliminate strategic behaviour (the decision maker's concern that a low offer will be rejected) and reputation concerns (the decision maker wanting to be seen as fair) as possible explanations for the results the dictator game was created. In the dictator game the recipient has no influence on their payoff nor the payoff of the dictator. Further the dictator is generally anonymous to the recipient and the researchers, and vice versa. Forsythe et al (1994) ran both ultimatum and dictator game experiments and found a statistically significant difference in amount offered or given to the recipient, with a significantly smaller mean transfer to the recipient in the dictator game.

2.4.2 Dictators and Social Preferences?

Forsythe et al (1994) attributed their results to a preference for “fairness” being more purely measured by the dictator game. However, Eckel and Grossman (1996) argued that in a situation in which dictators have no knowledge about the potential recipient, and thus cannot “know whether their partner is poor, or otherwise deserving of their generosity” (183), there is “little or no basis for altruism to play a part in their decision” (183). This is based on the assumption that “For fairness...to affect a decision, a donor must obtain some value from his donation” (184). This explanation is not congruent with the neuroeconomic evidence that people have emotional reactions to unfair dictator offers when the recipient is an hypothetical, anonymous individual (Haruno and Frith 2010). However, they establish experimentally that the identity of the recipient is important. They show that when an anonymous individual is replaced by a known charity there is a significant increase in the amount transferred by the dictator. Eckel and Grossman (1996, p. 189) interpret this as altruistic behaviour and argue that “the importance of social factors can only be introduced by abandoning, to some extent, abstraction”.

In a meta study of 129 dictator game experiments, Engel (2011) reported that the unweighted mean transfer to the other player by the dictator was approximately 30%, suggesting a consistent preference for improving the recipients situation. However, the “take-option” studies, such as Bardsley (2008) and List (2007), have cast serious doubt on this interpretation of dictator games. Bardsley (2008) conducted an experiment where both the dictator and potential recipient had an endowment, but the recipient’s was half that of the dictator. Two treatments were run. In the first dictators were allowed to transfer an amount between and including 0-30% of their endowment. In the second, dictators were allowed to take between 0-60% of the recipients endowment. It was found that while a majority of participants in the first treatment gave a positive amount, a majority took a positive amount in the second treatment, with the modal amount being the maximum 60%. The results are shown in Figure 2.1 below.

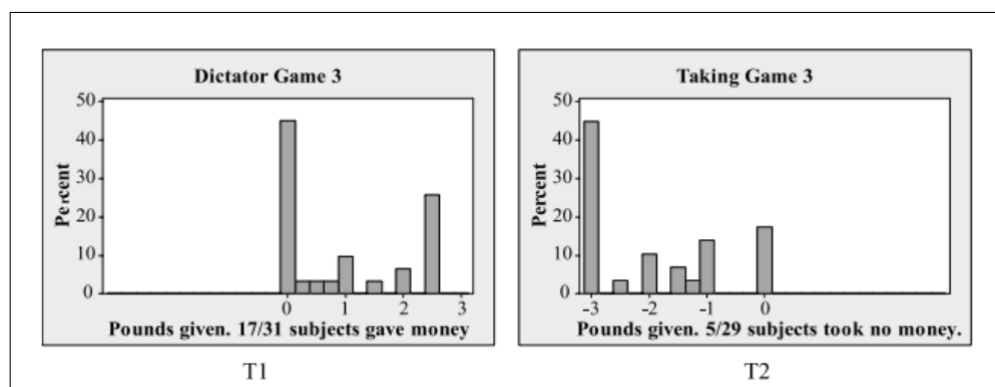


Figure 2.3: Allocation distributions in experiment 3. Reprinted from: Bardsley (2008). Dictator game giving: altruism or artefact?. *Experimental Economics*, 11(2), 126

List (2007) found that given a symmetrical menu of choices between giving and taking, very few dictators gave a positive amount and the modal choice was again to take the maximum amount possible. Oberholzer-Gee and Eichenberger (2008) found that allowing dictators to choose between playing a dictator game and playing a lottery with negative expected value caused the median offer to the recipient to fall from 41% in a dictator game only treatment to zero in the treatment where participants had a choice between the lottery or the game.

Cooper and Kagel (2012) interpret this result, Bardsley (2008) and List (2007), as an resulting in part from an experimenter demand effect. That is, dictators in the take option experiments took simply because the option existed ‘and the experimenter must therefore want it to be chosen ’ (Cooper and Kagel 2012, p. 39). Further, they interpret the lottery treatment as implying that when a concern to take an action is not necessarily linked with a opportunity to be generous, participants no longer feel the need to be generous.

Dana et al (2007) included treatments where dictators could choose from two alternative allocations between themselves and the recipient. In one treatment they had the opportunity not to have the recipients payoffs revealed. 44% of dictators chose this option. Of those dictators who revealed the recipients payoffs, significantly less chose the more equitable alternative than in a control treatment. In another treatment, dictators knew that recipients could not be sure that an unfair transfer was the result of a deliberate choice by the dictator or not, this addition significantly reduced the number of more equitable transfers relative to the baseline. Engel (2011) finds that “concealment” of this sort significantly reduces dictator giving in meta regression (see figure 2.4).

Dana et al (2006) gave dictators in one treatment the opportunity to exit the game while receiving a payoff (\$9) less than the maximum they could earn by playing the game (\$10). 28% of dictators chose this option. It might be explained by a experimenter demand effect, but Dana et al (2006) include another treatment with an exit option where recipients do not know how the money they receive is decided. In this treatment only 4% of dictators use the exit option. Dana et al (2006) and Cooper and Kagel (2012) interpret this as evidence that some participants are concerned with appearing fair. Andreoni and Bernheim (2009) develop a model that explicitly attempts to account for a desire to appear fair and find it has greater predictive power than a model based on distributional outcomes alone.

Altogether these results have led some authors to conclude that dictator giving is an “artifact” of the specific experimental conditions (Bardsley 2008, Cooper and Kagel 2012) and does not represent any real social preference. However, Franzen and Pointner (2013) find that a participants generosity in a typical dictator game significantly increases the probability that they will return a misdirected letter (containing cash) sent to them by the researchers either a few weeks or 2 years after they participated in the experiment. Further, Engel (2011) finds that a take option does not significantly reduce dictator giving in any of the regression variants (meta, OLS, Tobit, Logit) used in his meta study. Eckel and Grossman (2012) played three dictator games with a charity recipient. In one session participants were initially allocated \$20 and the charity nothing. In another, the charity was allocated the entire \$20. They found that there was no significant difference in the mean transfer to the charity between these two sessions, which they interpret as evidence for a greater consistency in dictators preferences when the recipient is deserving.

2.4.3 Dictators and Norms

Some researchers (Cooper and Kagel (2012), Krupka and Weber (2008, 2013)) interpret the variability of dictator giving as being driven by context dependent social norms. Krupka and Weber (2008) tested whether social norms can explain the change in participant behaviour observed when a take option is introduced. They ask participants to fill out a questionnaire regarding the degree of “social appropriateness” of a list of possible actions in a standard dictator game and one with take option. They found that the social appropriateness of giving small amounts was significantly greater when the option to take was introduced, and that the social appropriateness of giving nothing in the standard game was not significantly different from that of taking a small amount in the experiment with take option. Further the social appropriateness survey predicted actual in game behaviour in an actual dictator game they ran with different participants. Fershtman et al (2012) also advance a social norm explanation.

2.4.4 Moderated Giving

Figure 2.4 below shows all factors that were found to significantly affect dictator transfers in meta regression (Engel 2011). Both Bardsley (2008) and List (2007) have features identified by Engel (2011) as significant reducers of dictator transfers. Firstly, the participants were all students (although List’s results were replicated by Cappelen et al (2013) with Danish adults).

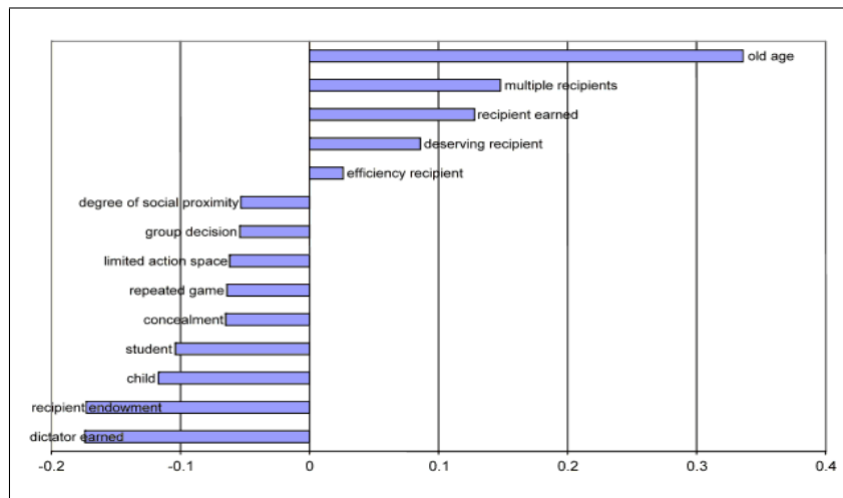


Figure 2.4: Significant determinants of dictator transfers. Reprinted from: Engel (2011) Dictator games: A meta study. *Experimental Economics*, 14(4), 606

Secondly, (by necessity) recipients were given an endowment. Thirdly, the dictators did not handle real money, instead indicating their preferred allocation on paper and then being paid it after the experiment. Engel (2011) shows that handling real money significantly increases dictator giving. Finally, the dictators knew nothing of the characteristics of the potential recipient and did not interact with potential recipients before, during or after the experiment. According to List (2007, p. 486) “The two groups did not have any contact before, during, or after the session”. As argued by Eckel and Grossman (1996), this makes the interpretation of the results as measuring the degree of altruistic behaviour problematic. Frohlich, et al (2001) found that when dictators had no evidence recipients existed beyond what they were told by researchers, they were less inclined to believe they did than in a situation where recipients were seated in the same room, and acted more selfishly on average.

2.5 Proposed Experiment

I aim to reproduce two treatments from List's (2007) experiment - the standard dictator game, and the symmetrical dictator game where dictators are allowed to take up to an amount equal to the amount they may give. Unlike List I will also conduct these games with a deserving recipient, specifically a charity. Using such a recipient has three effects. Firstly, Engel's (2011) Meta study shows a number of factors which positively influence the amount given by the dictator, of which one is whether the recipient is 'deserving'. Secondly, if Eckel and Grossman's (1996) interpretation of dictator behaviour is accepted, the deserving recipient treatments will be a more meaningful test of the degree of preference for altruism since the dictators can better evaluate whether a positive transfer is beneficial. Thirdly, I hypothesize that dictators are more likely to accept the validity of the experiment when the recipient is a well known charity rather than an anonymous, potentially fictitious individual, as suggested by Frohlich et al (2001).

2.5.1 Hypotheses

The main research question to be tested is whether the take-option effect persists when the recipient is identified as deserving - specifically, a charity. It is hypothesized that the take-option effect will be severely diminished when the recipient is a charity. This is, firstly, because altruistic participants will have greater confidence that a positive transfer is beneficial to the recipient. Secondly, I hypothesize that participants will feel more confident about the validity of the experiment instructions when they face a charity recipient.

The rationale for this claim is that the charities are organisations the participants know to exist outside of the experiment. The validity claim will be tested for using interval regression, as detailed in section 3.4 and chapter 4 (results). It is also hypothesized that the take option effect will not be completely eliminated. This is because a number of dictator game studies contain participants who act as money

maximisers, regardless of the deserving nature of the recipient (Eckel and Grossman 1996, Engel 2011). A subset of these participants may be motivated by financial need, which will be investigated by including a questionnaire question regarding the participants financial situation. Such participants would likely maximise income regardless of the experimental situation. A full set of auxiliary hypotheses investigated through the questionnaire will be detailed in section 3.3: questionnaire design.

Chapter 3

Methodology

3.1 Research Strategy

The research strategy was to undertake a dictator game experiment with four treatments. The design of the treatments follows List (2007) closely, while aspects of the session design are taken from Eckel and Grossman (2012). The main features of the four sessions undertaken are shown below in table 3.1.

Session	Defining Characteristics
A1	Anonymous recipient, standard game
A2	Anonymous recipient, take-option game
C1	Charity recipient, standard game
C2	Charity recipient, take-option game

Table 3.1: Experiment Sessions

All sessions were double blind, in order to mitigate reputation and experimenter demand effects. Those administering the experiment did not include the researcher. No participant participated in more than one session. As List (2007, p. 487) points out this means the results rely purely on “between subject variation”. The minimum desired session size was 20. Actual session sizes were 24, 21, 24 and 24. In the anonymous recipient sessions, no recipients actually existed. Dictators were however told that they had been paired with an actual participant, and any participants who questioned the existence of the recipient were reassured that they existed. Omitting recipients in these sessions ensured the total number of participants was sufficient for valid statistical inference using regression techniques and monetarily feasible.

3.1.1 Stakes

Similarly to List (2007) both dictator and recipient were initially endowed with \$5 (five Australian dollars), and an additional \$5 was endowed to the dictator, which they had to allocate between themselves and the recipient, choosing their preferred option to the nearest 50 cent increment. In the symmetrical game, they might instead opt to take an amount up to \$5 of the recipient's endowment. \$10 is the standard stake in dictator games (Engel 2011). There was also a \$15 show-up fee to encourage participation and participants were paid what they had allocated to themselves. When the recipient was a charity, all allotted funds were donated by the researcher - this was made clear to participants by a research assistant.

The inclusion of a show-up fee provides the potential for participants to be more generous than otherwise but also reduces the selection bias of the sample in the sense that it widens the interested subject pool from just students who like to take part in economics experiments to anyone interested in earning at least minimum wage for one hours participation. Since the experiment was well compensated (maximum earnings = \$30), the questionnaire included a question on the financial situation of participants in order to establish whether those in need of financial assistance dominated the sample. 28% of all participants ticked the box for "struggling" as their response to a question asking how they would describe their financial situation. Thus financial need does not seem to have driven participation. Furthermore, any positive effect on participant transfers from the show up fee ought to have a level effect across sessions, thus it would not affect inter session comparisons.

Another issue considered whether or not to allocate a show up fee to the charities. Providing charities with a show up fee would be consistent with the anonymous sessions, but also hard to explain to participants since the charity did not require such a fee. It was decided not to mention the show-up fee in the charity session allocation forms. Instead the presentation focused purely on the \$10/\$5 split between the

dictator and the charity of their choice (see session 3 allocation form in appendix A). This choice may be problematic if inequity aversion was a motive driving transfers, as participants might consider the inequality between themselves and charity as greater, due to the show-up fee, and thus allocate more than otherwise.

3.1.2 Procedure

All experiment sessions had the following common procedure - after the distribution, signing and collection of participant consent forms (see appendix A), research assistants distributed allocation forms and slips of paper with unique 5 digit codes (similar to Eckel and Grossman 2012). These codes were also written on corresponding allocation forms. An assistant then explained the role of the participants (which was also written on the allocation forms). They were to decide whether to allocate some of the extra \$5 dollars (or take some of the recipient's endowment in the take option treatments) that they had been allocated to a charity of their choice or a anonymous participant situated in another room. The allocation had to be to the nearest 50 cents. The use of the 50 cent intervals allowed for faster data processing and distribution of earnings to participants, as it is not necessary to round up participants choices. The results can could also be more easily transformed into valuable statistical information, such as the mean transfer, that aids interpretation of the results.

The participants were then told they had five minutes to indicate their preferred allocation on the allocation form. Once five minutes were up, the allocation forms were collected but participants kept the 5 digit code slip. A questionnaire with the same 5 digit code as their allocation form was now distributed to all participants, which they then completed. The questionnaire design is detailed in subsection 3.1.3 and can be viewed in appendix A.

Following the completion of this questionnaire by all participants and its collection by assistants, the participants received their experiment earnings in an envelope with the code as on their slip. They were then instructed to exit the room and check that the amount they had received in the envelope was correct. They were also told that after having done this they were to approach a research assistant sitting outside the experiment room (who was otherwise not involved in administering the experiment). This researcher then instructed them to sign a form confirming the amount of money in the envelope was the correct amount. Once every participant was confident they had received the correct amount, the assistant then immediately returned the form to the faculty finance office. This procedure aimed to ensure participant anonymity while maximising the value of the information obtainable from the participants. Being able to link allocation and questionnaire responses made it possible to check at the individual level whether those responses matched the participants' choice. For example, whether a participant who said they wanted to improve the recipients' situation actually transferred a positive amount.

3.2 Research Method

The data collected is all primary data comprising each dictator's allocation choice and survey answers. These were collected during the experiment and subsequently collated, sorted and cleaned by the researcher.

3.2.1 Sample characteristics

In order to be comparable to List (2007), the main target group for participants was university students. Although List used exclusively undergraduate students, in order to maximise participation rates this restriction was not implemented. Advertising was conducted through five channels - flyers, social media, advertising in lectures, email lists and the University career service website. Flyers were posted around the University campus. A modified flyer was also posted on a Facebook page used by

Macquarie university students to recruit experiment participants. In cooperation with lecturers, the experiment was advertised in class and via email to students undertaking various undergraduate and post graduate economics courses. Finally, an advertisement for the experiment was posted on the university career service website, which hosts a job board accessible only to students. Data from demographic questions in the questionnaire (shown in appendix A) allow for an assessment of subject characteristics. These are broken down by session in table 3.2.

Table 3.2: Select Subject Characteristics

Session	N	Avr. Age (s.d.)	Women	White	Econ Major	Understood
1	24	23 (6)	46%	29%	38%	75%
2	21	28 (13)	57%	52%	29%	88%
3	24	26 (5)	38%	29%	13%	90%
4	24	24 (5)	54%	33%	17%	83%

For the entire sample, students formed the overwhelming majority of participants (87%). Further, economics majors formed a significant minority of the whole sample (23%). Eckel et al (2005) have shown that economics majors are significantly less generous than other students, results on this issue are given in chapter 4. As shown by Eckel and Grossman (2008) and Engel (2011), women give significantly more in dictator games. Fershtman et al (2012) addressed this issue by using a 50% male, 50% female sample. In this case 48% of the sample reported as female. This is slightly less than 55%, which is the number of Macquarie University students listed as female.

55% of participants reported as “asian”, which well exceeds the 35% of the student population that are identified as “international” in official reports on university demographics. However, the quiz did not distinguish between Australian citizens and foreign nationals, so it is not possible to establish whether the ratio is reflective of the general student population, or alternatively over represents international students.

Substantial minorities of participants reported being charitable (defined as making charitable donations at least monthly) or religious (defined as attending religious services at least fortnightly), 24% and 20% respectively. These percentages were sufficiently large to allow for valid analysis of the effects of these factors on participant transfers.

The median participant age was 23 and the mean was 25, with a standard deviation of approximately 8 years. 95% of the sample was aged between 18 and 38. Thus participants are on average older than those in List’s sample, which consisted of only undergraduates. The survey has a few questions which test for the power of social norms to motivate giving - these use the “social appropriateness” scale of Krupka and Weber (2008, 2013).

3.3 Questionnaire Design

The questionnaire has four types of question. The first seven questions collect demographic information on participants in order to assess whether characteristics previously found to influence giving such as gender are important in this sample (Andreoni and Vesterlund 2001, Engel 2011). The second set of 14 questions asks participants how strongly they agree or disagree with a variety of statements, which are designed to reflect different motivations for giving and identify whether participants believed what they were told, and understood their task. The third type was a question taken from Krupka and Weber (2008), which asked how “socially appropriate” a participant felt their transfer choice was. This and its follow up question were included to assess whether participants believed their choice to be normal, and if not, what they thought a “socially appropriate” choice would be. The fourth type of question was a open answer question which asked participants plainly why they chose the transfer amount they did. The following subsections will explain the choice of questions within each type more fully. The full questionnaire can be viewed in Appendix A.

3.3.1 Demographic Questions

The first seven questions aimed to sort participants demographically so that demographic characteristics could be used in statistical analysis of the results in order to establish whether they significantly affected the transfer decision. The specific demographic questions were chosen based partly on those found to be important in the literature. The main source on which the decision for inclusion was based was Engel (2011) meta study. The meta study, as well as several individual studies, identified age, gender, whether the participant was a university student and whether the participant was an econ major made significant differences in the amount transferred, so questions asking about these characteristics were included. Furthermore, questions were included on the following characteristics, for the following reasons.

A question was included on the participant's financial situation. Participants were asked to choose one of the following terms to describe their financial situation - either "comfortable", "stable" or "struggling". The motivation for this question was to establish whether the substantial participation fee had led to a large proportion of participants who were "struggling" financially. In fact, 27% of the sample reported as struggling, a substantial minority but not so many as to suggest the participation fee was overwhelmingly driving participation. The question was also included to allow for a test of whether a participants (perception of their) financial situation significantly affected the amount they would transfer.

A question was included asking whether the participants regularly attended religious services (defined as at least once a fortnight). The rationale for the inclusion of this factor was that all major religious traditions teach some variant of the golden rule (treat others as you would like to be treated), and several teach that charity is mandatory, such as Islam. Thus religious participants might be expected to be more generous than the average participant.

Another question was included, asking whether the participant regularly gave to charity (defined as at least once a month). This was included in order to assess whether being charitable made a participant more likely to give to a stranger or a charity. Alternatively, someone who is already charitable may feel less motivated to give to a charity in an experiment, as they may feel satiated with their currently level of giving.

3.3.2 Motivational Factor Questions

The second group used a 5 point Likert scale (Likert, 1932) to assess the influence of various factors identified in the literature review or otherwise hypothesised to be important in motivating participant behaviour. Responses to these questions were used as explanatory variables in a regression analysis on the full sample of 93 observations and on sub samples of just the charity sessions and the anonymous recipient sessions. This method helped to establish which were important in determining participant transfers. The seven factors and their associated questionnaire questions are explained individually below.

The first factor to be investigated was whether participants felt that their emotions were an important influence on their choice of allocation. The first question of this set of questions asks participants how strongly they agreed or disagreed with the statement that they “chose what they *felt* was right”. The question concerns the role of emotion in motivating the choice. The justification for including this statement, and another similar statement - “My emotions influenced the amount I chose to transfer” - was previous research establishing a link between a subjects emotional reaction to a choice and the amount transferred (Haruno and Frith, 2011). The latter statement has a somewhat clearer meaning than the first.

The first question can be interpreted as asking if the participant feels their choice was “right” (correct), rather than felt right, although felt is italicised to elicit the

latter interpretation. The control by contrast is quite clear, asking directly if the participants emotions influenced their choice. Responses to the control question was used in regression analysis to establish whether those more strongly agreeing with the statement gave a significantly different amount.

The second factor investigated was conformity. The second question from the motivation set asked participants how much they agreed with the following statement - “I chose an amount that I expected many other people to choose”. Its control asked if they agreed their choice was close to the average choice. The correlation coefficient for responses to the two questions was .62 and highly significant, suggesting participants interpreted the two questions similarly.

The rationale for these questions was to identify whether participants generally believed that their choice would be close to the average, and if they did believe the choice to be close to the average, whether this significantly affected the amount they transferred. This information is valuable for evaluating a social norm explanation of transfers. Krupka and Weber (2008, p. 3) define norms as “jointly recognized perceptions” of socially appropriate actions. Therefore if dictator transfers are largely determined by a desire to reach certain norms, such as an equal split, the coefficient for a variable built from the conformity question responses should be consistent with this desire. For example, if transferring the maximum was the modal choice in the charity sessions, then the social appropriateness coefficient and the conformity coefficient should both be positive. Otherwise the “jointly recognised” part of the norm is not supported. However on explanation for the conformity coefficient not being positive would be that individuals recognise the norm but do not believe others will implement it.

Only 29% of participants (of 93 in total) agreed (chose 4 or 5 as their response) with the statement that they chose an amount they expected many others to choose. 41% felt their choice was close to the average. In the charity sessions, the amounts drop to 19% and 35% respectively. Thus participants generally did not expect their choice to be popular or the average throughout the experiment, undermining a norm based explanation.

The third factor investigated was what could be loosely termed “social preference”. The first of the two statements under this heading was “I chose an amount I thought would be fair”. This statement is somewhat subjective, as evidenced by answers to the questionnaires long answer question - “Please explain, as fully as you like, how you chose the amount you transferred in this experiment?”. Participants who transferred nothing, 10% or 50% of the maximum possible all described their choices as fair, for various reasons. Responses to the question were found to be significantly positively correlated with transfer amount ($r=.24$). The second statement was “I wanted to improve the recipient’s situation”. This statement was included as a method of assessing a participants desire to help the recipient. In this experimental situation, reputation and retaliation were assumed not to strongly determine the amount transferred as participants were completely anonymous. Thus improving another’s situation would only have the benefit of a warm glow and helping the participant attain what they believed to be a fair and/or socially appropriate allocation. Responses to the “improve” statement were used as a factor in statistical analysis.

The fourth factor investigated was concerned with how much the participant considered the choice. The statements used for this factor aimed to identify whether a participant made their choice quickly or slowly, and whether they “carefully considered” their choice. The justification for including this factor was to check if participants who made emotional choices also made quick choices (as measured by

a lower score for the consideration of the choice). This was not found to be the case, with weak or negative correlation coefficients between the two consideration statement responses and the emotional choice statement responses (see appendix B for correlation coefficients).

The fifth included factor concerned whether the participant desired to maximise their monetary reward. This was done with two statements which both expressed this goal in similar language to Erkal et al (2011). The justification for inclusion was to check the proportion of participants who answered in the affirmative, to test whether participants generally perceived themselves to be money maximising and to see if the statement responses predicted significantly lower transfer amounts.

The sixth included factor concerned participants perceptions of the validity of the experiment. Participants responded to the statements “I believed that the money I transferred would be given to the recipient” and “I feel confident that what the researchers told me was true”. The justification for including these statements was Frohlich et al (2001), which assessed whether subjects perceptions of the validity of the experiment affects their conduct, with a survey including similar statements. Frohlich et al (2001) found a significant proportion of dictators in a typical experiment did not believe the anonymous recipient existed, causing them to behave completely selfishly. Thus the two statements were included to check to what degree participants believed the experiment instructions, whether this predicted choice and whether there were significant variations in responses between the anonymous and charity sessions. It is hypothesised that participants would be more likely to accept that their money would be transferred to a known charity than an anonymous recipient for whom they had no proof of existence.

The final included factor concerned whether participants were confused about their task in the experiment. Participants responded to the statements “The instructions

I was given clearly explained my task” and “I would be able to explain the task I just completed to a friend”. The justification for inclusion is that the results would be of little value if a large proportion of participants did not understand their task. The responses to the two statements were highly significantly positively correlated with $r=.48$. The “clarity” heading in table 3.2 refers to the proportion of participants who answered that they agreed or strongly agreed with the statements implying that they understood the experiment instructions. The total for all sessions was 83% and the median response to both statements was 5 = strongly agree (means by session in appendix B.6).

3.3.3 Social Appropriateness Questions

Thirdly, I included questions to test the social norm explanation advanced by Krupka and Weber (2008, 2013), Fershtman et al (2012) and others. These took the form of asking participants about how socially “appropriate” they believed their choice to have been, where social appropriateness was defined as “a behaviour that most people agree is the correct of ethical thing to do. Another way to think about what we means is that if individual A were to select a socially inappropriate choice, then someone might be angry at individual A for doing so” Krupka and Weber (2008, p. 42). Unlike in Krupka and Weber (2008) participants who answer that their choice was very or somewhat inappropriate are prompted to provide what they think to be a socially acceptable allocation. The justification for including these two questions was to test whether participants generally agreed on what were socially appropriate transfers and what a transfer being socially appropriate implied for the amount transferred, on average. It is hypothesized that more socially appropriate transfers will generally be greater than the average, as the equal split has been seen to be a focal point in previous research and in the charity sessions giving everything might be seen as more appropriate. Therefore it is assumed the coefficient for the variable in regression will be significant and positive.

3.3.4 Open Answer Question

The final question of the questionnaire asked participants - ‘Please explain, as fully as you like, how you chose the amount you transferred in this experiment?’. The value of this question was thought to lie in rooting out participants whose actions in the experiment would not contribute to the questions it was designed to answer. An example of this sort of response would be writing “I deliberately choose to keep everything because I feel such experiments cannot reveal how self-interested individuals are”. Such responses could be removed from the results. In fact every participant chose to answer this question but none wrote something of this nature, although some did comment that they did not take the decision very seriously because it was “only a game”.

This highlights that when advertising, caution must be taken to use wording that does not potentially trivialise the task. The long answer responses generally provided valuable explanations by participants of their choices, which would be highly difficult to reveal using strength of agreement questions. For example, one session 1 (anonymous, typical) participant wrote that she wanted the recipient to feel special, so she transferred more than the equal split, as she perceived this would be the average choice. Another session 1 participant, who chose the equal split, justified it on the basis that she did not know if the recipient needed the money more than her and she was financially secure, so she decided to transfer half. The overall impression given by participants responses is that their justifications are diverse, not easy to classify neatly into factors, and that abstract rules or social norms (such as “give 10%”, a tithing rule in several major religions) motivated a substantial number of participants.

3.3.5 Possible Confounds

When conducting a questionnaire concerning actions that participants may feel would be socially inappropriate, there exists the potential for self-serving rationali-

sation and a fear of being sanctioned in some way for expressing selfish or socially inappropriate responses. This may be thought to bias survey responses, such that they underestimate the participants true feelings about certain statements, such as being a money maximiser. However it was felt that given participant anonymity these concerns are minimised. Further, participants who chose low transfers were highly likely to report being money maximisers. The correlation coefficient between an average of the participant's response to the two money maximising statements and the amount transferred was highly significantly negative and of large magnitude, $r=(-).74$. Thus it seems money maximising participants generally identified themselves as such.

The use of a 5 point scale for the statements, while simple for participants to understand and for the researcher to process, has some limitations. Participants may try to avoid "extreme" responses such as "strongly" agree/disagree when these are in fact appropriate, artificially reducing variation in the data, rendering it less informative. Also, regression coefficients derived from using question responses as predictors have the somewhat unnatural interpretation of representing the change in the participants transfer induced from moving one category to the right on the scale, such as from 3 (neutral) to 4 (agree). This also implies that the relationship between the response and the change in the transfer is linear, which may not be the case.

3.4 Interval Regression Analysis

When choosing how to analyze the collected data, the fact that the transfer values are quasi continuous (Engel 2011) and censored at \$5 and -\$5 must be taken into account. The latter issue makes the OLS estimator biased. In order to extract as much information as possible, interval regression analysis, a special type of ordered probit model where the threshold values are given, was chosen as a suitable tool. It is commonly used in estimates in environmental economics to estimate willingness to

pay, for instance Alberini (1995). This was due partly to the intuitive interpretation of the coefficients, which can be interpreted as the change in the desired transfer to the recipient (although this would also be true for the OLS estimation). An interval regression model is more informative in this case than a standard ordered probit or logit model as the threshold values are given in the latter. The main benefit of having the threshold values is that the desired transfer amount, which is latent, can be estimated. This would be impossible if the threshold values have to be estimated because the latent variable would be only ordinal, like a utility level, not cardinal.

However using interval regression analysis means defining intervals to be considered. These were defined as between 25 cents less and more than a particular transfer amount. For example, \$4 would lie in the interval \$3.75 and \$4.25. The use of this model means assuming that the regression error term is normally distributed. In fact normality tests rejected this null for two of the three regressions run after the experiment (see appendix B). However since the dependent variable is discrete, residuals are not a reliable measure of the random error. Further, as the sample sizes were 45, 48 and 93 respectively, a central limit theorem implies so that the estimator of the coefficients would be approximately normal regardless. In this case the estimator is the maximum-likelihood estimator which approximately follows the normal distribution when the sample size is large and the model is correctly specified.

To summarise, the three main benefits of using this approach are that:

1. It effectively takes into account the censored nature of the dependent variable (transfer amount) by leaving the lower bound for the lowest choice and the upper bound for the highest choice open.
2. It also accounts for the discrete nature of the amount to be transferred that is observed, while the desired amount could be any real value and latent.
3. By having the threshold values, the desired transfer amount can be estimated

and analysed.

Multicollinearity

In addition to a non-normal error term, there was also the potential for significant multicollinearity between some of the regressors. For example, the social appropriateness variable and “improve” variable might be strongly correlated, if participants who strongly agree that they want to improve the recipients situation are doing so as they want to achieve a socially appropriate allocation of the equal split. Prior to running regressions, correlation coefficients for all relevant variables were examined to establish if any appeared to be highly correlated. Apart from those for which this would be an issue (deliberately similar questionnaire questions) this did not appear to be the case (correlation coefficients in appendix B). VIF values were checked after each regression was run and for none did the values exceed 5, thus they were well below the conventional threshold of 10, which highlights severe multicollinearity.

3.5 Benefits and Limitations of Design

The experiment outlined above has the potential to provide further evidence that the dominant interpretation of dictator game giving is flawed, or alternatively show that the results of Bardsley (2008) and List (2007), among others, may result from particular features of their experiments that minimised other regarding behaviour. Further it allows for a test of Frohlich et al’s (2001) results on the effects of participants beliefs regarding the validity of the experiment on their transfer amount. It also provides data to test the influence of a variety of factors derived from the economics, psychology and neuroeconomic literature on dictator transfers.

However there are some important limitations to the experimental design. Separating the social norm explanation from the social preference explanation is difficult. There exists both a strong norm in Australian society of charitable giving being a positive act and it is generally considered to be an act motivated by a desire to be al-

truistic. Thus there may not be much difference between what is considered socially appropriate and what is altruistically preferred, making it difficult to distinguish the two motives. It will nevertheless be attempted using the variables entering into the regression analysis, which is detailed in the next section.

Chapter 4

Analysis of Results

4.1 Transfer Distributions

4.1.1 Sessions 1 and 2

Figure 4.1 shows how the percentage of participants choosing particular transfer amounts varies over the four sessions. Table 4.1 adds interpretation to the graphs, showing a variety of summary statistics related to the amount transferred, split by session. From table 4.1 it can be seen that the mean and median offers varied substantially between sessions, as did the percentage of positive transfers.

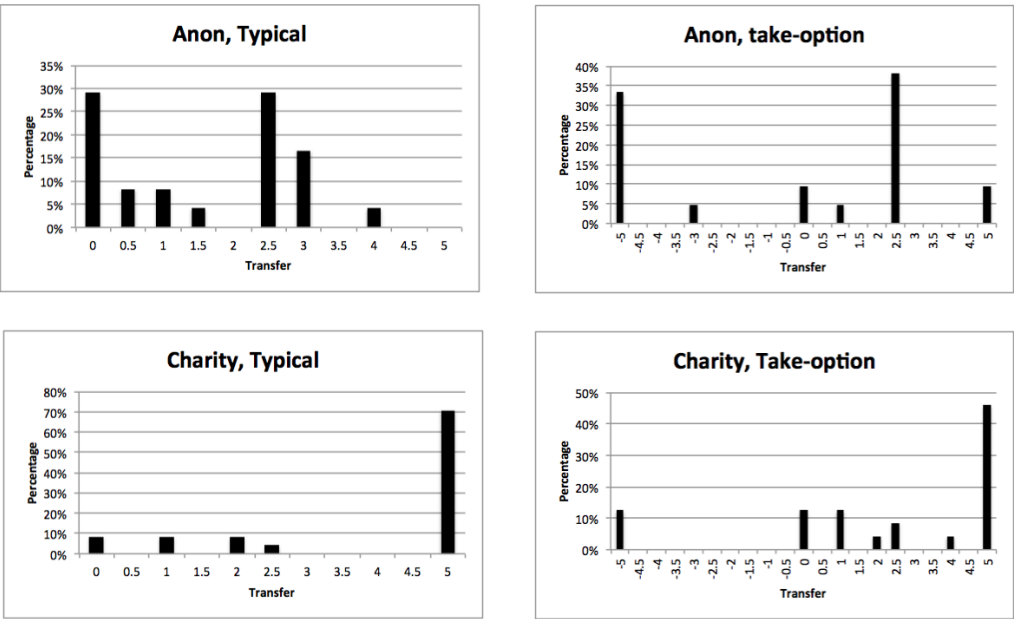


Figure 4.1: Percentage of participants choosing a particular transfer amount

Table 4.1: Transfer Summary

Session	Rate of (+) transfers	Median Offer	Mean Offer	Average (+) offer
1	71% (71%)	2.00 (1)	1.58 (1.33)	.45 (.38)
2	52% (10%)	1.00 (-4.5)	-0.33 (-2.48)	.56 (.42)
3	92%	5.00	3.90	4.25
4	75%	2.50	2.25	3.83

How are we to interpret this table and graph? Firstly, by comparison with the existing literature. Specifically, List (2007), which shares a very similar design. List conducted a typical and a take option game with anonymous recipients. Table 4.1 gives List’s baseline and “take-\$5” session values in brackets adjacent to those from sessions 1 and 2 of this experiment. The overall picture for the typical game (session 1) is that participants behaved very similarly to those in List’s typical (or “baseline”) game, as evidenced by the identical rate of positive transfers and the strikingly similar mean offer and average positive offer (expressed as a percentage of the total possible positive offer, ignoring negative and zero offers). The sample size of session 1 (24) is also equal to List’s baseline session.

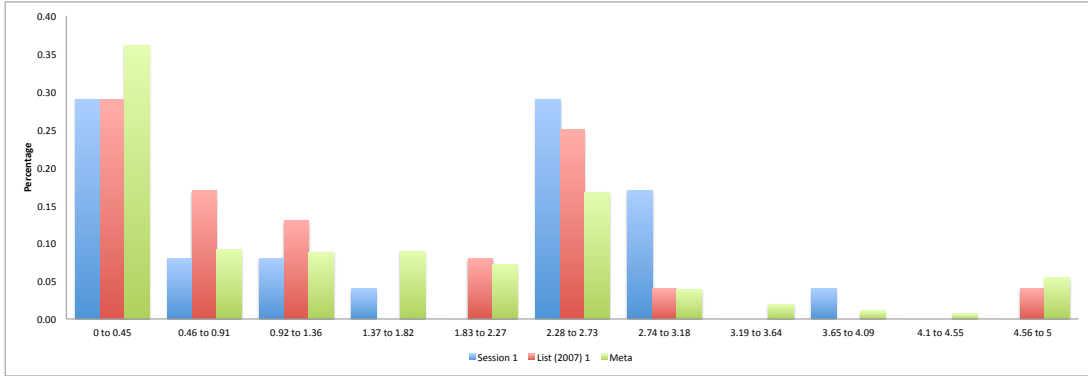


Figure 4.2: Comparison of typical game transfers for session 1 (blue), List (2007) “baseline” (red) and Engels (2011) 328 treatment meta study (green)

We can compare the giving in session 1 with List’s baseline treatment and the average of 328 treatments, $N = 20813$ (Engel, 2011) graphically. This comparison is made in figure 4.2. The samples appear quite similar although session 1 and List’s baseline have substantially more participants choosing to transfer \$2.5 and substantially less transferring nothing. Additionally, no one in session 1 chooses to give the entire \$5, although the meta study indicates that close to 5% of participants do so.

Overall the results from the first session indicate a distribution of giving which corresponds closely to that found in previous research. Only the median offer, which is substantially larger than List’s, predicts the substantial difference between the table values for session 2 and List’s “take \$5” session (shown in brackets). It can be seen from table 4.1 that his participants were substantially less generous on all metrics, although qualitatively the results are the same. As shown by figure 4.3, the distribution of transfers in take-\$5 is somewhat different to session 2.

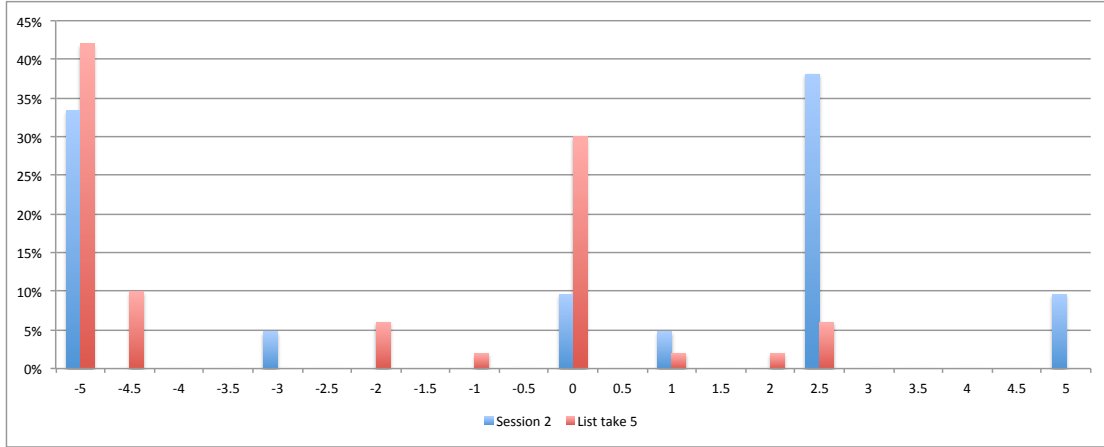


Figure 4.3: Comparison of transfer distributions: session 2 (blue) and “take \$5” (red) (List 2007)

The primary difference is in the amount of participants choosing zero and \$2.5, which are respectively substantially lower and higher in session 2 relative to take-\$5. Further, almost all taking in session 2 is the maximum \$5, while in take-\$5 10% of participants choose to take \$4.50 and 5% took \$2. There are a number of plausible explanations for the difference in the increase in taking between session 2 and take-\$5, relative to their respective baseline sessions. List (2007) interpretation of the difference between transfers between his baseline and session 2 was in terms of moral cost. The drop in giving between the baseline and take-\$5 sessions is interpreted as indicating that “over the \$1 to \$5 range, utility is steeper in wealth than in morality”. The comparatively mild drop in positive offers in this experiment can be explained using the concept of moral cost. In all sessions of this experiment participants were paid \$15 for participating, yet there is no show-up fee reported in List’s paper.

Thus, since participants in this experiment knew they were already \$15 better off merely for participating, their payoff range was between \$20-\$30, rather than between \$5 and \$15. Thus the marginal utilities of morality and monetary reward could be expected to differ between the samples, potentially accounting for the relatively more mild take-option effect in this experiment. However, this explanation would imply that session 1 participants in this experiment ought to have been significantly more generous than List's baseline participants, yet in fact the results are very similar, as shown in table 4.1.

Another interpretation is that subjects in this experiment were significantly less convinced that their choice would remain anonymous than those in List's experiment. Engel (2011) shows that for a typical game, the distribution of giving alters when dictators are identified in some way, such as having to stand up in a room which also contains the recipients. Offers of nothing are significantly decreased and the equal split becomes the modal choice. Figure 4.2 shows some support for this since the equal split is tied for the modal choice with zero for session 1. Thus the distribution is somewhere between that where there is no identification and that where there is. Further, in session 2 the equal split is the modal choice. However, the designs of the two experiments are quite similar, down to the wording of the instructions. But as aforementioned the distribution of session 1 and List's baseline distribution are very similar, which would be unlikely if subjects had substantially different beliefs about their anonymity.

A third explanation is demographic. Meta analysis has found that the older participants are the more they tend to give (although results on middle age are mixed) and women are significantly more generous than men, *ceteris paribus* (Engel 2011). It has also been found that economics students are significantly less generous than other students (citation). List (2007) does not include any subject characteristics other than that his subjects were university undergraduates. It is thus not possible

to assess whether a relatively large number of economics majors or a very small proportion of women might have implied less generosity overall in his sample. Session 2 of this experiment had a particularly high proportion of women (57%) and the average participant age was greater than for the sample as a whole (28, s.d.=13, see table 3.1). Additionally 29% of session 2's participants were not students. By contrast List's sample was exclusively made up of undergraduates. These demographic differences may thus go some way to explaining the milder take-option effect. Regression analysis of sessions 1 and 2 found that female participants gave significantly more.

A fourth explanation concerns sample size. The sample size for session 2 was less than half of take-\$5 ($N=50$). It could be that a larger sample would have shown a distribution more reflective of the take-\$5 treatment. However this seems unlikely, as reducing positive offers to even 25% would have required the extra participants needed to reach a sample of 50 to make not a single further positive offer. A fifth explanation concerns the participants perceptions of the validity of the experiment. A previous study (Frohlich et al 2001) found that a substantial number of dictators playing a typical game did not believe the recipient existed and a dummy variable representing this belief in regression analysis predicted significantly lower transfers.

In order to assess whether participants in session 2 believed what they were told about the recipient the questionnaire included two test questions (see appendix A and subsection 3.3.2). 88% of participants answered that they either very strongly or quite strongly agreed with the propositions that a recipient did exist and that they were confident what the researchers told them was true. There is no way to know to what extent participants in List's experiment believed that they were paired with a recipient but a significant difference could underlie the different results.

The difference in the distributions could plausibly be a combination of differences in demographic factors, validity and some random variation but there is no conclusive evidence. It is clear that the qualitative results fit most of the existing literature on take-option dictator games. The rate of positive transfers falls, a large percentage of participants take (33%) and there is a reduction in median and mean offers. Regression analysis reveals a significant, negative coefficient for session 2.

However, unlike for List (2007), a Fishers exact test of the rate of positive transfers reveals no significant difference between the typical and take option sessions (see appendix B for all statistical test output). A Kolmogorov-Smirnov test rejects the null that the distributions from which the samples are drawn are different at the 10% level. It should be noted that a meta analysis of dictator games found the take option having no significant effect on dictator giving, in contrast to the studies which have explicitly considered it (Engel 2011). In this case, giving is significantly reduced on average but substantially more positive giving remains than List (2007).

4.1.2 Sessions 3 and 4

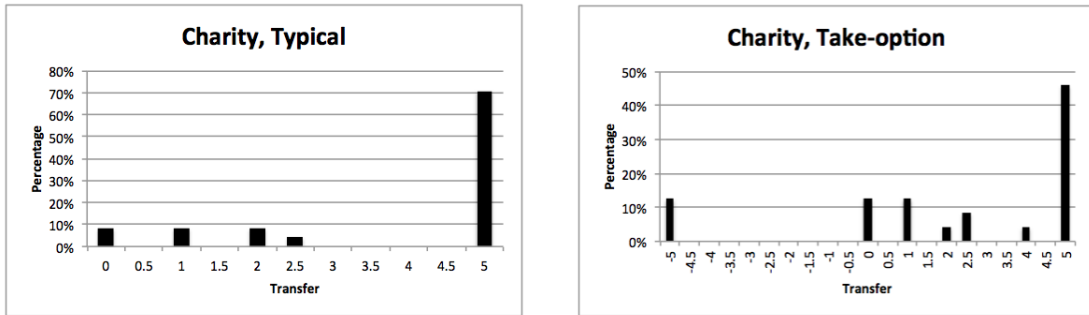


Figure 4.4: Comparison of transfer distributions: sessions 3 and 4

Sessions 3 and 4 were identical to the first two sessions except that participants were told they could pick one of a list of 10 (see appendix A) charities to transfer to. Figure 4.4 shows the distribution of transfers in sessions 3 and 4. It is immediately obvious that the distributions are quite different to the anonymous sessions. Firstly, giving the maximum amount to the charity is by far the modal choice (and

the median choice in session 3), with no other choice attracting more than 15% of participants. The equal split and zero are no longer focal points. Secondly, the take-option appears to have less effect on participant behaviour. In fact, the distributions are almost identical, except for the 13% of participants who chose to take the maximum amount.

Comparing the anon typical and the charity typical sessions (1 and 3), table 4.1 shows that a greater percentage of participants gave a positive amount in session . However, the rate was not significantly different according to Fishers exact test. Nevertheless, the mean, median and average positive offer were substantially higher. This was to be expected since giving the entire \$5 was by far the most popular choice in session 3. Contrasting the session 3 results with session four we can see that the introduction of the take option reduces the rate of positive offers (but not significantly so). The median offer is cut in half, and the mean and average positive offers are substantially reduced. However this effect appears solely due to the 13% of participants that take the maximum possible. A Kolmogorov-Smirnov test cannot reject the null that the two samples are drawn from the same distribution.

4.2 Interval Regression Analysis

4.2.1 Full Sample

Interval regression analysis was employed to establish which factors had a significant influence on the ideal amount a particular participant would wish to transfer. Of interest was whether transfers would vary systematically by session, demographic attributes and/or responses to specific questionnaire questions. Table 4.3 provides the results for the entire sample (all experiment sessions). All regressors for which a prior had been expressed in the methodology section were included, with the exception of university students and participant age. Since 87% of the sample were students, it was deemed unlikely that there would be sufficient variation in the

Table 4.2: Full Sample Regression (N=93)

	Coefficient	Std. Error	z	p-value	Sign.
Constant	1.63938	1.68684	0.9719	0.3311	
Money maximising	-1.01398	0.145154	-6.9855	0.0000	***
Improve	0.431936	0.161402	2.6762	0.0074	***
Session 2	-2.20282	0.443857	-4.9629	0.0000	***
Session 4	-1.60449	0.413054	-3.8845	0.0001	***
Comfortable	0.867250	0.371611	2.3338	0.0196	**
Appropriate	0.503017	0.226958	2.2163	0.0267	**
Validity + Charity	0.189039	0.111265	1.6990	0.0893	*
Woman	0.491395	0.326183	1.5065	0.1319	
Econ Major	-0.199772	0.433597	-0.4607	0.6450	
Religious	0.101825	0.446031	0.2283	0.8194	
Charitable	-0.135411	0.442164	-0.3062	0.7594	
Emotional choice	0.0333613	0.111198	0.3000	0.7642	
Conformity	-0.224189	0.156107	-1.4361	0.1510	
Considered	0.0912863	0.150766	0.6055	0.5449	
Understand	0.0528609	0.220257	0.2400	0.8103	

student variable to capture an effect. Participant age was not included as the vast majority (95%) of participants were adults aged between 18 and 38.

A Note on Goodness of Fit

Three regressions are presented here - one for the full sample of four sessions (charity and anonymous recipient) and two subsamples of just charity and just anonymous recipient sessions. For each of these a few alternate specifications were tried, notably replacing the “comfortable” variable with the “struggling” variable. It was found to be insignificant and worsened the log likelihood of the model. The same was true for participant age. In order to assess the goodness of fit of the model, consider the mean absolute errors. For the full sample regression, the mean absolute error was 1.17, implying that the average error in the predicted transfer amount was +/- \$1.17. For the anonymous recipient sessions this value was \$0.94 and for the charity sessions, \$1.08. Thus the mean absolute error was around \$1 for each session. This was considered to be sufficiently precise for the coefficient interpretations to be meaningful.

Full Sample Results

It can be seen that a single demographic factor was significant for the full sample regression (including all four experiment sessions). If a participant chose the answer “comfortable” when asked to choose the answer which best reflected their financial situation, they would give 87 cents (17% of the total possible) more on average. Women were expected to give significantly more, but although the coefficient was positive and substantial it was not significant at any conventional significance level. Economics majors were predicted to be less generous (Eckel et al 2005), and while the coefficient was substantially negative, it was also not significant.

Of the other 5 factors which significantly predicted giving, two were session dummies. Giving was \$2.20 and \$1.60 less than the average over the whole sample in sessions 2 and 4, respectively. This shows that a take-option effect was present for both the anonymous recipient and charity sessions. The remaining four significant factors related to questionnaire questions. The “max money” factor was an average of participants responses to the two questions regarding a desire to get as much money as possible from the task, as discussed in section 3. It can be interpreted as measuring the effect of the participants strength of agreement with the statements in the questionnaire on their desired transfer amount. The questions had a scale of 1-5, thus every extra 1 corresponds to a decrease in giving of \$1.01 cents on average. A participant who strongly agreed to both statements would be expected to transfer \$5.05 less than the average.

As discussed in section 3, two questions in the questionnaire aimed to provide a measure of the effect of other regarding motivations on the amount transferred. However, as discussed in section 3, the question asking a participant how strongly they agreed with the statement that they chose a fair amount is distinct from the question asking participants whether they wanted to improve the recipients situation. Only the “improve” variable was used in regression analysis as its interpretation was more

straightforward than the “fair” variable, thus it was more likely to capture a other regarding motivation - concern for the recipient. Its coefficient is highly significant with a non-negligible magnitude coefficient for the full sample. This shows that a desire to improve the recipients situation significantly predicted increased transfers.

The social appropriateness variable, named “appropriate”, was also significant and positive, with a similar magnitude to the improve variable. Although used by Krupka and Weber (2008) to elicit the appropriateness of the whole range of possible choices, in this case the appropriateness question was only asked for the participants actual choice. It asks what is the “correct or ethical” thing to do, which is not necessarily the norm. However, it has explanatory power independent of the improve question, implying participants interpreted the two questions somewhat differently. The improve question straightforwardly asks if a better off recipient was important to the dictator. Agreeing with this statement is sometimes consistent with trying to reach a norm such as the equal split. Whether or not participants were motivated by norms or preferences is thus hard to discern. Discussion of this issue, taking into account results from all regressions, is continued in subsection 4.3.

The final significant factor (although only at the 10% level), was an interaction term comprising of whether the session had a charity recipient and the participants strength of agreement with two experiment validity variables. This term was significant at the 10% level, giving weak support to the contention that participants in the charity session had more confidence in the validity of the experiment, and this predicated higher transfers. Further, inspection of the average values to responses to each statement (in appendix section B.6) shows that the average values rose substantially between the anonymous and charity sessions.

Table 4.3: Sessions 1 and 2 Regression (N=45)

	Coefficient	Std. Error	z	p-value	Sign.
Constant	3.30067	2.13854	1.5434	0.1227	
Money maximising	-0.811600	0.184334	-4.4029	0.0000	***
Improve	0.406154	0.179592	2.2615	0.0237	**
Session 2	-2.56220	0.397865	-6.4399	0.0000	***
Comfortable	0.650534	0.437599	1.4866	0.1371	
Appropriate	0.593783	0.264246	2.2471	0.0246	**
Woman	1.05810	0.421567	2.5099	0.0121	**
Econ Major	-0.427797	0.446447	-0.9582	0.3379	
Religious	0.482297	0.604128	0.7983	0.4247	
Charitable	-0.254054	0.629389	-0.4037	0.6865	
Emotional choice	0.459011	0.159108	2.8849	0.0039	***
Conformity	-0.297997	0.186497	-1.5979	0.1101	
Considered	-0.0210588	0.243149	-0.0866	0.9310	
Understand	-0.202808	0.280322	-0.7235	0.4694	
Validity	-0.536857	0.228894	-2.3454	0.0190	**

4.2.2 Sessions 1 and 2

In order to establish more intuitively how the take option affected participant transfers, and to see if any particular variables were important within the anonymous and charity sessions, regressions were run using only the observations from these sessions (1-2 and 3-4). It was found that some factors not significant in the full sample had significant effects in one of the two sub-samples. Table 4.3 provides the interval regression results for sessions 1 and 2. It can be seen that the money maximising variable is again highly significant and negative, inducing a fall in the transfer of approximately 4 dollars, if a participant strongly agreed with the questionnaire statements that they maximised income. Secondly the session 2 dummy variable is highly significant and of large magnitude, implying that a participant in session 2 gave \$2.56 less than those in session 1, on average. Thirdly, unlike in the full sample but consistent with previous literature (Andreoni and Vesterlund 2001, Eckel and Grossman 2008, Engel 2011) the woman dummy was significant at the 5% level and positive, reporting that women would give \$1 more on average than men. Fourthly, unlike in the full sample, the emotional choice variable was significant at the 1% level and positive, indicating that feeling emotional about the choice

implied a significant increase in the amount transferred. The coefficient value was .45, indicating emotional participants (those that strongly agreed with the questionnaire statement) gave on average approximately 2 dollars more. This supports the research on the relationship between emotions and giving explored in subsubsection 2.3.9. Fifthly, the coefficient for the validity composite variable is significantly negative. This result did not support the hypothesis that a greater degree of confidence in the validity of the experiment would imply a greater probability of a equitable transfer. One possible explanation is that participants who treated the choice more abstractly, felt they could afford to be equitable, however the result is still puzzling.

As in the full sample regression, the variables “improve” and “appropriate” were both significantly positive (at the 5% level). Participants who strongly agreed with the improve statement would be expected to give \$2 more, while those who felt their choice was very appropriate would be expected to give \$1.18 more. The first result suggests that participants considered the anonymous recipients welfare to some degree, whether due to empathy, morality, a desire to appear fair and/or a desire to achieve a particular social norm. The second result implies that participants who gave more were also more likely to believe their choice to be ethical.

Table 4.4: Sessions 3 and 4 Regression (N=48)

	Coefficient	Std. Error	z	p-value	Sign.
Constant	-0.641090	2.49461	-0.2570	0.7972	
Money maximising	-1.16771	0.194899	-5.9914	0.0000	***
Improve	0.841714	0.264304	3.1846	0.0014	***
Session 4	-1.50029	0.427595	-3.5087	0.0005	***
Comfortable	0.807874	0.567670	1.4231	0.1547	
Appropriate	0.455632	0.358862	1.2697	0.2042	
Validity	0.158126	0.224520	0.7043	0.4813	
Woman	0.315310	0.508058	0.6206	0.5349	
Econ Major	0.701148	0.760586	0.9219	0.3566	
Religious	-0.914826	0.677294	-1.3507	0.1768	
Charitable	0.181706	0.561503	0.3236	0.7462	
Emotional choice	-0.108035	0.158155	-0.6831	0.4945	
Conformity	-0.546592	0.244059	-2.2396	0.0251	**
Considered	0.174924	0.206027	0.8490	0.3959	
Understand	0.565425	0.310993	1.8181	0.0690	*

4.2.3 Sessions 3 and 4

The regression output from the sub-sample including only the charity recipient sessions (3 and 4) is shown in table 4.4. It shows that as in sessions 1 and 2, strong agreement to statements “money max” and “improve” implied significantly lower or higher transfers, respectively. Unlike the full sample and sub-sample for sessions 1 and 2, the “conformity” composite variable is significantly negative, at the 5% level. Its interpretation is that the more confident participants felt that their choice was a common one, close to the session average, the less they would give. Its coefficient is -0.55, implying a \$2.75 drop in the transfer amount for a participant strongly agreeing to both conformity statements. The final significant variable is “understand” which is a composite of responses to the two statements measuring a participants perception of their understanding of the experiment. Its coefficient, 0.57, implies that a participant who strongly agreed with both understanding statements would give \$1.14 more than a participant who was undecided for both statements.

4.3 Discussion of Results

4.3.1 Main Hypothesis Confirmed

The main hypothesis made was that a deserving recipient would reduce the take-option effect, as participants would feel they have more reason to transfer part of their endowment. As hypothesized a take-option effect persisted but in a diminished form. The coefficient for the session 4 dummy was significant and negative, both for the full sample regression and for the session 3 and 4 sub-sample. Its coefficient value for the full sample, -\$1.6, implied a significant fall in the participant transfer relative to the average across the four sessions. In the session 3 and 4 sub-sample, its value of -\$1.5 implies a drop in giving of one and half dollars relative to the average over the two charity sessions. The take-option effect however appeared less strong than in the anonymous recipient case. The session 2 take-option was estimated to reduce giving by \$2.20 in the full sample and \$2.50 for the anonymous subsample.

The significance of the improve coefficient in all regressions implies that participants were motivated by a desire to improve the recipients situation in all sessions. However its coefficient doubled in magnitude between the anonymous recipient and charity sessions, implying that those motivated to help the recipient were substantially more motivated in the charity sessions. This is consistent with the first reason given for the take option hypothesis - namely that altruistic participants would be more strongly motivated to give to the recipient in the charity sessions.

The second part of the rationale for the take option hypothesis was also (weakly) supported by the data. A interaction term combining a charity session dummy and the average of a participants responses to the two questions asking how confident they were in the validity of the experiment was included in the full sample regression. It was significant at the 10% with a positive coefficient, possibly implying that charity session participants had a greater belief in the validity of the experiment, and as a result gave significantly more. This would tend to dampen a take option effect. However an alternative explanation is that this coefficient merely captured that participants gave more on average in the charity sessions, rather than a substantial difference in validity. As noted in 4.2.1, the mean responses to the validity statements rose substantially between the anonymous and charity sessions.

The third part of the rationale for the main hypothesis was that a small take option effect would still occur due to some participants, possibly out of financial need, acting as income maximisers regardless of the experimental conditions. Indeed in session 4 13% took the maximum amount, similar to the amount that gave nothing in session 3 (8%). Of these 60% reported to be “struggling” financially.

4.3.2 Impact of Emotions

Participants strength of agreement to the statement “My emotions influenced how much I decided to transfer to the recipient” was used as an independent variable

in interval regression analysis. It was hypothesized in chapter 3 that a emotional participant would transfer significantly more on average, in keeping with previous research. It was found that the variable was not significant for the full sample of 93 observations or the charity sessions, but was highly significant for the anonymous recipient sessions. Here it implied an increase in the participant transfer of \$2.25 if the participant strongly agreed with the statement, supporting the hypothesis. One interpretation of this result is that participants in these sessions had less reason to care about the recipient than in the charity sessions and therefore those who were nevertheless generous were those motivated by an emotional reaction to the situation.

4.3.3 Impact of Altruism

There was no variable which could be interpreted as directly measuring a desire to be altruistic. However, the variable “improve” measured how strongly a participant agreed with the statement “I wanted to improve the recipient’s situation”. The interpretation of their response is difficult as agreeing with this statement is consistent with altruism, but also the desire to achieve a particular norm such as the equal split. It is also consistent with a desire to appear fair, while not actually being altruistic. However, the regression output allows for some inference to be made. Firstly, the improve coefficient is highly significant with a non-negligible magnitude for the full sample and both sub-samples of only the anonymous and only the charity sessions, respectively. This implies the desire to improve the recipients situation was a consistent predictor of the transfer amount.

Further, its coefficient value for the charity sessions was twice that in the anonymous recipient sessions (rising from .4 to .8, implying increased transfers of \$2 and \$4 respectively), indicating that participants were more strongly motivated to help the recipient in the charity sessions. As noted in confirmation of the main hypothesis, this is consistent with an explanation of the diminished take option effect in

the charity sessions in terms of recipients being more highly motivated to behave altruistically. The significantly negative conformity coefficient for the charity sessions implies that although most participants gave everything, it was not a choice they felt would be common and those more confident that their choice was close to the norm gave significantly less on average.

In concert with the insignificant appropriateness variable for sessions 3 and 4, this lends credence to the view that increased altruism, rather than the recognition of a shared social norm to give everything, drove increased participant transfers.

4.3.4 Impact of Social Norms

The social appropriateness variable was a significant predictor of dictator transfers for the full sample and anonymous session regressions. For the full sample, a participant classifying their transfer choice as highly appropriate would give \$2 more than otherwise. Clearly thinking your choice was the “correct or ethical” choice and something other people would approve of, as stated in the social appropriateness question, implied a significantly higher transfer. However, for the sample as a whole the appropriateness variable was uncorrelated with the conformity variable. That is, there was no significant association between believing that a choice was socially appropriate and that it was a common choice. Further, as related in subsection 3.3.2, only 29% of participants felt their choices were common. This does not necessarily mean that participants were not trying to satisfy norms. It may have been the case that many were trying to satisfy a norm, but they did not think that many others would do so.

4.3.5 Impact of Demographic Factors

Demographic factors did not play a major role in determining participant transfers, according to the regression analysis. However, two factors did influence dictator transfers. As found in several previous studies (Andreoni and Vesterlund 2001,

Eckel and Grossman 2008), including a meta study (Engel 2011), being female implied a significant increase in the transfer amount, within the anonymous recipient sessions. The coefficient for the woman dummy implies a woman would transfer a dollar more on average than a man. However, for the full sample, women were found to be no more generous than men.

The other factor concerned the financial status of the dictator. Dictators reporting to be financially “comfortable” (rather than “stable” or “struggling”) were significantly more generous, transferring 87 cents more than otherwise according to the full sample regression coefficient. Engel’s (2011) meta analysis of dictator games does not include a variable on financial situation, yet it seems intuitive that more well off participants have less incentive to act selfishly if there is diminishing marginal utility of income.

Chapter 5

Conclusions

The main aim of this thesis was to investigate the extent of and motivations for other regarding behaviour in the context of a novel dictator game experiment. Of interest was whether the take-option effect found in several dictator game studies (List 2007, Cappelen 2013) persisted when dictators faced a charity recipient. Four experiment sessions were run - two with anonymous recipients and two with known charities as recipients. Sessions 2 and 4 gave the dictators the opportunity to take from the recipients. The main conclusion is that the take option effect was diminished but persisted with a charitable recipient, as evidenced by a significant, negative coefficient for a take option dummy variable. This value was however substantially smaller in magnitude than the take option coefficient for the anonymous recipient sessions. Thus the main hypothesis of the thesis was confirmed.

In making this hypothesis, it was suggested that the main reason underlying the reduced take option effect was that altruistic participants would be better able to evaluate the value of their transfer when faced with a known charity rather than an unknown person, who could be better or worse off than themselves, and thus would be more strongly motivated to give. The data gave some support to this view, showing that participants who strongly agreed with the statement “I wanted to improve the recipient’s situation” in the questionnaire gave twice as much more in the charity sessions than in the anonymous recipient sessions. An alternative social norm based explanation, given the most socially appropriate choices in sessions 3

and 4 were \$4.5 and \$3 respectively, was less well supported by the data. A variable representing participants agreement to statements implying they felt confident that their choice was a common one was significantly negative in the charity sessions. This implies that participants who felt their choice was a common one gave significantly *less* than otherwise. This appears inconsistent with a ‘jointly recognized perceptions” (Krupka and Weber 2008, p. 3) definition of social norms. However it might be that participants did strive to achieve a norm, but generally did not believe others would do so.

Evidence was also found, as posited in chapter 3, that participants were more convinced of the validity of the experiment when they faced a charity recipient, as evidenced by a significant positive coefficient for a charity - validity interaction term. The interpretation of this term’s coefficient could however be that giving was higher in the charity sessions, which is well supported by the data, rather than that validity was significantly different. However questionnaire responses indicate there was a rise in participants agreement with the validity statements in the charity sessions.

There was also some support for emotions influencing the amount transferred, as a coefficient representing the degree of the participants agreement to the statement “My emotions influenced how much I decided to transfer to the recipient.” was highly significant in the anonymous recipient sessions, predicting a substantial increase in giving.

In terms of demographic factors, as found in many earlier studies and meta analysis (Andreoni and Vesterlund 2001, Eckel and Grossman 2008, Engel 2011), women gave significantly more on average than men, in the anonymous recipient sessions. However in the charity sessions and for the full sample of four sessions, no significant difference was found. A questionnaire question asking participants how financially secure they felt, produced a dummy variable, “comfortable”, for the regression anal-

ysis. It was found that for the full sample, participants who reported to be financially “comfortable” gave significantly more than other participants.

Opportunities for Future Research

While the experiment conducted has shown that a take option effect exists for a charity recipient, it is clear from the significantly different transfer distributions between the charity and anonymous recipient sessions that participant behaviour is significantly different from the anonymous recipient sessions. Although various explanatory variables allow for some inference to be made as to why participant behaviour is different, further research would be beneficial.

For example, although the data provide some support for a social preference interpretation of the increased giving in the charity sessions, it is not possible to definitively separate this motive from other plausible motives, such as a different norm implying greater generosity, or a desire to avoid appearing unfair. Conducting a similar experiment, but incorporating an exit option, as in Dana et al (2006), would allow for a test of the strength of the motive of appearing fair in the context of a deserving recipient. It would also make it possible to separate the reputation effect from other factors.

Finally, the finding that financially “comfortable” participants give significantly more is intuitive, and suggests that one important determinant of dictator transfers may have been overlooked by previous research. For example, there is no variable for financial situation included in Engel’s (2011) meta study.

Appendix A

Experiment Documents

A.1 Allocation Forms

Participant number:

10001

Allocation form (A-1)


Instructions

Your task is to divide an amount of real money between yourself and another participant you have been randomly paired with, who is currently waiting in another room. You will both be paid what you end up with after you make your choice. The money you will divide is **NOT** your show-up fee of \$15 - that is completely separate.

The other person will not be told who you are, and you will not be told who they are, during or after the experiment. Your choice will also remain completely anonymous to other participants and the researchers.

Both you and the other person have been given \$5 to begin with. However, you have been given an extra \$5. That means, **you currently have \$10 and your partner has \$5.**

You



\$10

+


Show-up fee

\$5

+

Show-up fee

Them



Your task is to choose how much, if any, of the extra \$5 you have been given you would like to transfer to the other person. Your choice can be any amount from \$0 to \$5, to the nearest 50 cents. The other person will not be able to reject your choice. Please write the amount you choose in the box below.

Amount to transfer

\$

Figure A.1: Sample allocation form from session 1

Participant number:

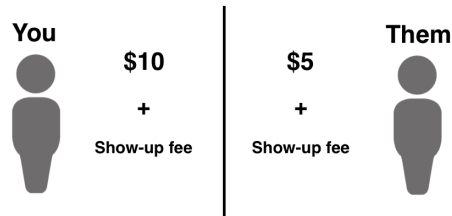
20001

Allocation form (A-2)

Instructions

Your task is to divide an amount of real money between yourself and another participant you have been randomly paired with, who is currently waiting in another room. You will both be paid what you end up with after you make your choice. The money you will divide is **NOT** your show-up fee of \$15 - that is completely separate.

The other person will not be told who you are, and you will not be told who they are, during or after the experiment. Your choice will also remain completely anonymous to other participants and the researchers. Both you and the other person have been given \$5 to begin with. However, you have been given an extra \$5. That means, **you currently have \$10 and your partner has \$5.**



Your task is to choose how much, if any, of the extra \$5 you have been given you would like to transfer to the other person. You can also transfer a negative amount i.e. you can take up to \$5 from the other person. Therefore your choice can be any amount from (-)\$5 to \$5, to the nearest 50 cents. The other person will not be able to reject your choice. Please circle either “give”, “take” or “no change” in the left box below and write the amount you wish to transfer in the right box. If you do not wish to give or take, circle “no change” and write \$0.

give or take or no change	\$
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Figure A.2: Sample allocation form from session 2

Participant number:

30001


Allocation form (C-1)

Instructions

Your task is to divide an amount of real money between yourself and an Australian charity, which you will be allowed to pick from a choice of ten. You will both be paid what you end up with after you make your choice. The money you will divide is **NOT** your show-up fee of \$15 - that is completely separate.

The charity you pick will never know of your choice. Your choice will also remain completely anonymous to other participants and the researchers. Both you and the charity you choose are given \$5 to begin with. However, you are given an extra \$5. That means, **you currently have \$10 and the charity you pick has \$5.**

You



\$10

Charity

\$5

?

Your task is to choose how much, if any, of the extra \$5 you have been given you would like to transfer to the charity. Your choice can be any amount from \$0 to \$5, to the nearest 50 cents. The charity will not be able to reject your choice. Please write the name of the charity you have chosen and the amount you wish to transfer in the boxes below.

Which Charity?	
Write the amount to transfer	\$

Figure A.3: Sample allocation form from session 3

Participant number:

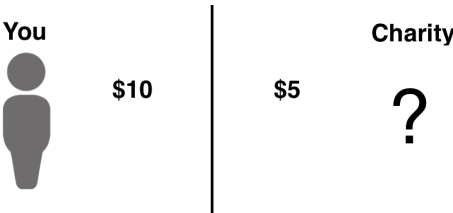
40001

Allocation form (C-2)

Instructions

Your task is to divide an amount of real money between yourself and an Australian charity, which you will be allowed to pick from a choice of ten. You will both be paid what you end up with after you make your choice. The money you will divide is **NOT** your show-up fee of \$15 - that is completely separate.

The charity you pick will never know of your choice. Your choice will also remain completely anonymous to other participants and the researchers. Both you and the charity you choose are given \$5 to begin with. However, you are given an extra \$5. That means, **you currently have \$10 and the charity you pick has \$5.**



Your task is to choose how much, if any, of the extra \$5 you have been given you would like to transfer to the charity. You can also transfer a negative amount i.e. you can take up to \$5 from the charity. Therefore your choice can be any amount from (-)\$5 to \$5, to the nearest 50 cents. The charity will not be able to reject your choice. In the boxes below, write the name of the charity, circle "give", "take" or "no change" and write the amount you wish to transfer. If you do not wish to give or take, circle "no change" and write \$0.

Which charity?	
give or take or no change	\$

Figure A.4: Sample allocation form from session 4

A.2 Questionnaire

Participant number: 10001

Questionnaire

Please answer ALL the following questions. Your answers will be completely confidential - it will not be possible to identify you personally.

1. What is your age? _____
2. What is your sex? (Circle one number.) 01 Male 02 Female
3. Which of the following categories best describes you? (Circle one number.)
01 Asian 02 Black/African 03 White/Caucasian 04 South American
05 Aboriginal/Torres Strait Islander 06 Other (Which?: _____)
4. Are you a university student? 01 Yes 02 No
5. Are you an economics major? 01 Yes 02 No
6. How would you describe your financial situation? 01 Comfortable 02 Stable 03 Struggling
7. Do you regularly attend religious services? (at least every two weeks) 01 Yes 02 No
8. Do you regularly donate to charity? (at least once a month) 01 Yes 02 No
9. Please rate how strongly you agree with the following statements about your choice in the task you just completed, from 1 = disagree strongly to 5 = agree strongly. Circle the number that most closely represents your opinion.
 - i) I transferred the amount that *felt* right.
Disagree Strongly 1 2 3 4 5 Agree Strongly
 - ii) I chose an amount that I expected many other people to choose.
Disagree Strongly 1 2 3 4 5 Agree Strongly
 - iii) I chose an amount I thought would be fair.
Disagree Strongly 1 2 3 4 5 Agree Strongly
 - iv) I thought about my choice for a couple of minutes.
Disagree Strongly 1 2 3 4 5 Agree Strongly
 - v) I wanted to get as much money as possible.
Disagree Strongly 1 2 3 4 5 Agree Strongly

Figure A.5: Questionnaire page 1

Participant number: 10001

vi) I believed that the money I transferred would be given to the recipient.

Disagree Strongly 1 2 3 4 5 Agree Strongly

vii) The instructions I was given clearly explained my task.

Disagree Strongly 1 2 3 4 5 Agree Strongly

viii) I wanted to improve the recipient's situation.

Disagree Strongly 1 2 3 4 5 Agree Strongly

xi) My emotions influenced how much I decided to transfer to the recipient.

Disagree Strongly 1 2 3 4 5 Agree Strongly

x) I treated the choice as an opportunity to get more money.

Disagree Strongly 1 2 3 4 5 Agree Strongly

xi) I think my choice will be close to the average choice for all participants.

Disagree Strongly 1 2 3 4 5 Agree Strongly

xii) I carefully considered my choice.

Disagree Strongly 1 2 3 4 5 Agree Strongly

xiii) I feel confident that what the researchers told me was true.

Disagree Strongly 1 2 3 4 5 Agree Strongly

xiv) I would be able to explain the task I just completed to a friend.

Disagree Strongly 1 2 3 4 5 Agree Strongly

10a. How "socially appropriate" would you describe the amount of money you transferred to the recipient? We define "socially appropriate" as the behaviour that most people agree is the "correct" or "ethical" thing to do. Another way to think about what we mean is that if an individual A were to select a socially inappropriate choice, then someone else might be angry at individual A for doing so.

01 Very socially appropriate	02 Somewhat socially appropriate
03 Somewhat socially inappropriate	04 Very socially inappropriate

Figure A.6: Questionnaire page 2

Participant number:

10001

10b. If you think your choice was **somewhat or very inappropriate**, what do you think a socially appropriate division of the money would be? Please answer to the nearest 50 cents.


Amount you would keep:

Amount the recipient keeps:

11. Please explain, as fully as you like, how you chose the amount you transferred?

Figure A.7: Questionnaire page 3

A.3 Participant Consent Form



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Chief Investigator's / Supervisor's Name: Tony Bryant
Chief Investigator's / Supervisor's Title: Associate Professor of Economics

Participant Information and Consent Form

Name of Project: A Dictator Game with take-option and two types of recipient

You are invited to participate in a study of giving behaviour. The purpose of the study is to investigate whether individuals will allocate money to a recipient when they are not compelled to do so (you are a dictator!). The researchers are interested in the motivation for and consistency of such giving in a variety of contexts.

The study is being conducted by Matthias Oldham (matthias.oldham@students.mq.edu.au), a Master of Research student in economics, under the supervision of chief investigator Tony Bryant (tony.bryant@mq.edu.au), associate professor of economics. The study is funded by Macquarie University through the Master of Research program.

If you decide to participate, the Dictator Game will proceed as follows. You will be asked to decide how to allocate an amount of money between yourself and a recipient. The recipient will have no control over the amount of money you allocate, which is your decision alone. You will indicate your choice on a sheet of paper (allocation form) provided, which you are then asked to deposit in a box at the front of the room. You will also be provided with a small slip of paper with a unique 5 digit code that is the same as one printed on your allocation form - this will allow you to collect the money you allocate to yourself without the researchers being able to personally link you to your allocation choice. Following the completion of this task by all participants in the room, you will be handed a short questionnaire to complete containing demographic questions and other questions about why you chose the allocation you did. Once this has been completed by all participants, you will be invited to collect the amount of money allocated to yourself from a table at the front of the room, where it will be placed in an envelope with the unique five digit code you have a copy of.

Any information or personal details gathered in the course of the study are confidential, except as required by law. No individual will be identified in any publication of the results. Data from the experiment will be available only to Matthias Oldham and Tony Bryant and will be securely stored on campus. A summary of the results of the data can be made available to you on request, simply send an email to matthias.oldham@students.mq.edu.au asking for an electronic copy.

Participation in this study is entirely voluntary: you are not obliged to participate and if you decide to participate, you are free to withdraw at any time without having to give a reason and without consequence. Signature required on following page.

Participant Information and Consent Form

Page 1 of 2

[Version no.][Date]

Figure A.8: Participant information and consent form

A.4 Table of Charities

Table of Charities

Charities	Short Description
Oxfam Australia	Invests in local organizations around the world that hold promise in their efforts to help the poor move out of poverty; committed to long term relationships in search of lasting solutions to hunger, poverty, and social inequities.
World Vision Australia	A Christian relief, development and advocacy organisation dedicated to working with children, families and communities to overcome poverty and injustice.
Save the Children Australia	One of Australia's largest aid and development agencies dedicated to helping children. They use donations to protect and support children in need and campaign for children's rights.
Fred Hollows Foundation	Fred Hollows (1929-1993) was an Australian philanthropist and ophthalmologist who became known for restoring eyesight to thousands of people in developing countries. The foundation continues his work.
WWF Australia	Work to conserve endangered species, protect endangered spaces, and address global threats to the planet, such as climate change.
White Ribbon	Through primary prevention initiatives and an annual campaign they seek to change the attitudes and behaviours that lead to and perpetuate men's violence against women.
Greenpeace Australia Pacific	A campaigning organisation which uses non-violent confrontation to expose global environmental problems and push for solutions which protect and sustain the natural environment.
Australian Cancer Research Foundation	A cancer charity funding world-class cancer research in Australia.
Get Up! Australia	A community advocacy organisation which provides citizens with the opportunity to get involved and hold politicians accountable on important issues.
Medicins sans frontieres (Doctors without borders) Australia	Doctors and nurses volunteer to provide urgent medical care in some 70 countries to civilian victims of war and disaster regardless of race, religion, or politics.

Figure A.9: List of 10 charities with short descriptions

Appendix B

Statistics

B.1 Correlation Coefficients

Correlation coefficients, using the observations 1–93
 5% critical value (two-tailed) = 0.2039 for n = 93

Transfer	Age	Woman	Asian	White	
1.0000	0.1361	0.1729	0.0730	−0.0723	Transfer
	1.0000	−0.0219	−0.0784	0.0492	Age
		1.0000	0.0402	−0.0276	Woman
			1.0000	−0.8537	Asian
				1.0000	White

South_American	Other	Uni	Econ	Comfort	
−0.0688	0.0375	−0.0314	−0.2824	0.1537	Transfer
0.0567	0.0312	−0.6002	−0.0126	0.2098	Age
−0.1405	0.0606	0.0136	−0.0440	0.1557	Woman
−0.1706	−0.2744	0.0853	0.1959	−0.1061	Asian
−0.1099	−0.1768	−0.0763	−0.2688	0.1479	White
1.0000	−0.0353	0.0543	0.2586	−0.0850	South_American
	1.0000	−0.0603	−0.0261	−0.0261	Other
		1.0000	0.1328	−0.0987	Uni
			1.0000	−0.0398	Econ
				1.0000	Comfort

B.1. CORRELATION COEFFICIENTS

Stable	Struggling	Religious	Charitable	Felt_right	
0.0879	−0.2426	0.0657	0.1656	0.3710	Transfer
−0.1115	−0.0769	−0.0408	0.3260	0.1401	Age
0.0283	−0.1791	0.1074	−0.0482	0.2554	Woman
0.0651	0.0293	0.0093	−0.2061	−0.0274	Asian
−0.1018	−0.0287	0.0144	0.1907	0.0023	White
0.0112	0.0685	−0.0751	−0.0801	−0.0516	South_American
0.0658	−0.0474	−0.0025	0.0993	0.0885	Other
0.1393	−0.0592	−0.0622	−0.2800	−0.0189	Uni
−0.0317	0.0726	0.1422	−0.2500	0.0495	Econ
−0.5316	−0.3666	−0.1050	0.1077	0.1491	Comfort
1.0000	−0.5931	−0.0955	−0.1913	0.1340	Stable
	1.0000	0.2047	0.1078	−0.2889	Struggling
		1.0000	0.3004	−0.1018	Religious
			1.0000	0.0073	Charitable
				1.0000	Felt_right

Emo_choice	Many_others	Average_choice	Fair	Improve	
0.0407	−0.2218	−0.1540	0.3435	0.5910	Transfer
0.0002	−0.0977	−0.1448	0.1294	−0.0104	Age
−0.0713	−0.0815	0.0241	0.1843	0.0990	Woman
−0.1565	−0.0192	0.1038	0.0486	0.0524	Asian
0.0377	0.1314	−0.1038	−0.0136	−0.0040	White
0.1759	−0.0891	0.0891	−0.1871	−0.2008	South_American
0.1505	−0.1792	−0.0649	0.0425	0.0226	Other
−0.0648	0.1949	0.0707	−0.1132	0.0480	Uni
−0.1328	0.0508	0.0833	0.0124	−0.4067	Econ
0.0748	0.0320	−0.0255	0.1021	0.0063	Comfort
−0.0222	−0.0361	0.0300	0.0254	0.0762	Stable
−0.0467	0.0092	−0.0087	−0.1249	−0.0897	Struggling
0.0090	−0.2440	−0.1147	−0.0634	0.1513	Religious
0.0875	−0.1303	−0.1695	−0.0149	0.1117	Charitable
0.1118	0.0699	0.1266	0.6654	0.2538	Felt_right
1.0000	−0.1943	−0.2112	0.0251	0.1263	Emo_choice
	1.0000	0.6234	0.0368	−0.1525	Many_others
		1.0000	0.2311	−0.0221	Average_choice
			1.0000	0.2440	Fair
				1.0000	Improve

Minutes	Careful	Max_money	Extra_money	Real_giving	
0.0075	0.0075	-0.6856	-0.7331	0.3223	Transfer
-0.0828	0.0375	-0.1499	-0.1779	-0.1156	Age
0.0011	-0.0577	-0.1568	-0.1451	0.1892	Woman
-0.0259	0.0997	-0.0227	-0.1062	0.0514	Asian
0.1016	-0.0356	-0.0353	0.0255	-0.1250	White
-0.0424	-0.1803	0.2202	0.1968	-0.0369	South_American
-0.1314	-0.0274	-0.0170	0.0524	0.1760	Other
-0.0281	-0.1328	0.1038	0.1320	0.1797	Uni
-0.0148	0.0735	0.2695	0.2657	-0.0387	Econ
-0.0313	-0.0531	-0.1183	-0.0915	0.0749	Comfort
0.0502	-0.0955	-0.0492	-0.1107	0.1375	Stable
-0.0254	0.1554	0.1665	0.2086	-0.2223	Struggling
-0.1093	0.0955	0.0262	-0.0831	0.1270	Religious
-0.1885	-0.0141	-0.2652	-0.1962	0.0706	Charitable
-0.2364	-0.0101	-0.3273	-0.3931	0.1368	Felt_right
-0.0129	0.0742	-0.0105	0.0122	0.1850	Emo_choice
-0.1285	-0.2491	0.1552	0.1575	-0.1188	Many_others
-0.1215	-0.2078	0.1913	0.2055	-0.1213	Average_choice
-0.0263	0.0887	-0.3499	-0.4155	-0.0292	Fair
-0.1504	0.0426	-0.3924	-0.4492	0.3292	Improve
1.0000	0.3786	-0.0018	0.0768	-0.0603	Minutes
	1.0000	-0.1225	-0.0725	0.0966	Careful
		1.0000	0.8062	-0.1941	Max_money
			1.0000	-0.2479	Extra_money
				1.0000	Real_giving

Truth	Clear	Explain	Considered	Conformity	
0.0512	0.0898	0.0468	0.0090	-0.2112	Transfer
-0.1271	0.0244	-0.0318	-0.0359	-0.1326	Age
-0.0909	0.1007	0.0016	-0.0297	-0.0361	Woman
0.0644	0.0655	-0.1853	0.0352	0.0420	Asian
-0.1522	-0.0354	0.1920	0.0496	0.0247	White
0.1315	-0.3175	-0.2057	-0.1236	-0.0072	South_American
0.0969	0.1355	0.1318	-0.1029	-0.1400	Other
0.1818	-0.0277	-0.1379	-0.0890	0.1523	Uni
0.0693	-0.1133	-0.3117	0.0289	0.0731	Econ
-0.0904	0.0218	-0.0458	-0.0491	0.0059	Comfort
0.0626	-0.0867	0.1570	-0.0166	-0.0060	Stable
0.0171	0.0746	-0.1290	0.0649	0.0010	Struggling
0.0436	0.1073	-0.0562	-0.0232	-0.2042	Religious
-0.0359	0.1675	0.1240	-0.1342	-0.1647	Charitable
-0.0526	0.0755	-0.1452	-0.1644	0.1067	Felt_right
0.2504	-0.0978	0.0607	0.0304	-0.2242	Emo_choice
-0.1499	0.0554	0.0723	-0.2179	0.9155	Many_others
-0.1646	-0.0743	-0.0954	-0.1914	0.8852	Average_choice
-0.1518	0.1506	-0.0609	0.0291	0.1408	Fair
0.1702	0.0506	0.0541	-0.0787	-0.1021	Improve
0.1734	-0.0119	0.2480	0.8726	-0.1389	Minutes
0.3674	0.1788	0.2526	0.7824	-0.2551	Careful
-0.0106	-0.0975	-0.0906	-0.0658	0.1908	Max_money
-0.0189	-0.1231	-0.0238	0.0134	0.1994	Extra_money
0.5055	-0.0411	-0.0881	0.0104	-0.1331	Real_giving
1.0000	0.1028	0.1195	0.3105	-0.1738	Truth
	1.0000	0.4775	0.0863	-0.0053	Clear
		1.0000	0.3002	-0.0061	Explain
			1.0000	-0.2281	Considered
				1.0000	Conformity

Validity	money_max	approp	Understand	
0.2194	-0.7464	0.4881	0.0750	Transfer
-0.1397	-0.1725	0.2917	-0.0097	Age
0.0610	-0.1589	0.1417	0.0497	Woman
0.0665	-0.0677	-0.0694	-0.0934	Asian
-0.1593	-0.0052	0.0778	0.1125	White
0.0519	0.2194	-0.0056	-0.2922	South_American
0.1585	0.0186	-0.0091	0.1544	Other
0.2083	0.1240	-0.1431	-0.1064	Uni
0.0160	0.2816	-0.1100	-0.2651	Econ
-0.0064	-0.1104	0.0370	-0.0204	Comfort
0.1165	-0.0841	0.1681	0.0641	Stable
-0.1219	0.1973	-0.2198	-0.0510	Struggling
0.0996	-0.0298	-0.1136	0.0139	Religious
0.0216	-0.2428	0.1007	0.1646	Charitable
0.0514	-0.3790	0.5389	-0.0615	Felt_right
0.2499	0.0009	-0.0428	-0.0063	Emo_choice
-0.1543	0.1646	-0.0229	0.0755	Many_others
-0.1641	0.2088	0.0561	-0.1003	Average_choice
-0.1024	-0.4026	0.5911	0.0317	Fair
0.2902	-0.4427	0.2679	0.0609	Improve
0.0616	0.0394	-0.0867	0.1616	Minutes
0.2632	-0.1027	0.0558	0.2568	Careful
-0.1208	0.9506	-0.4779	-0.1082	Max_money
-0.1573	0.9501	-0.5896	-0.0755	Extra_money
0.8751	-0.2325	0.1398	-0.0793	Real_giving
0.8599	-0.0156	-0.1897	0.1303	Truth
0.0334	-0.1161	-0.0643	0.8053	Clear
0.0149	-0.0602	-0.0651	0.9054	Explain
0.1803	-0.0277	-0.0289	0.2443	Considered
-0.1762	0.2053	0.0152	-0.0067	Conformity
1.0000	-0.1463	-0.0237	0.0262	Validity
	1.0000	-0.5615	-0.0967	money_max
		1.0000	-0.0750	approp
			1.0000	Understand

B.2 Fisher's Exact Tests

Rate of Positive Transfers, Sessions 1 and 2

data: session12
p-value = 0.2333
alternative hypothesis: true odds ratio is not equal to 1
95 percent confidence interval: 0.550526 9.046934
odds ratio: 2.168208

Rate of Positive Transfers, Sessions 1 and 3

data: session13
p-value = 0.1365
alternative hypothesis: true odds ratio is not equal to 1
95 percent confidence interval: 0.02056284 1.40301863
odds ratio: 0.2276211

Rate of Positive Transfers, Sessions 3 and 4

data: session34
p-value = 0.2448
alternative hypothesis: true odds ratio is not equal to 1
95 percent confidence interval: 0.5508886 40.3923817
odds ratio 3.571835

B.3 Two-sample Kolmogorov-Smirnov Tests

Sessions 1 and 2

data: session1 and session2
D = 0.381, p-value = 0.07748
alternative hypothesis: two-sided

Sessions 3 and 4

data: session3 and session4
D = 0.25, p-value = 0.4413
alternative hypothesis: two-sided

B.4 Interval Regression Normality Test Output

Full Sample Regression

Test for normality of residual –

Null hypothesis: error is normally distributed

Test statistic: $\chi^2(2) = 15.5233$

with p-value = 0.000425763

Anonymous Sessions Regression

Test for normality of residual –

Null hypothesis: error is normally distributed

Test statistic: $\chi^2(2) = 1.95579$

with p-value = 0.376101

Charity Sessions Regression

Test for normality of residual –

Null hypothesis: error is normally distributed

Test statistic: $\chi^2(2) = 21.5261$

with p-value = 2.11676e-05

B.5 Demographic Characteristics

Factor	Session 1	Session 2	Session 3	Session 4	Average
Sample size	24	21	24	24	-
Average age	23	28	26	24	25.25
Women	46%	57%	38%	50%	47%
Asian	63%	43%	58%	54%	55%
White	29%	52%	29%	33%	35%
South Amer.	4%	0%	0%	4%	2%
Other ethnic	0%	5%	8%	8%	5%
Uni student	92%	71%	88%	92%	86%
Econ major	38%	29%	13%	13%	23%
Comfortable	25%	33%	17%	21%	24%
Stable	54%	33%	46%	50%	46%
Struggling	17%	33%	33%	29%	28%
Religious	8%	19%	29%	25%	20%
Charitable	4%	29%	33%	25%	23%

B.6 Questionnaire Response Averages

Statement	Session 1	Session 2	Session 3	Session 4
Amount felt right	3.87	3.95	3.91	3.92
Emotions influenced choice	2.87	3.29	3.35	3.67
Many people, same choice	3.26	3.00	2.61	2.29
Close to average choice	3.70	3.19	3.09	3.21
Fair	3.61	3.86	3.78	3.71
Improve recipient situation	2.52	2.52	4.35	4.38
Couple of mins to decide	4.00	3.57	3.13	3.04
Carefully considered	3.83	4.19	3.70	4.08
As much money as possible	3.00	2.95	2.30	2.58
Opportunity for extra money	3.09	2.71	1.87	2.25
Money will reach recipient	3.48	3.38	4.48	3.88
Researchers truthful	3.57	3.62	4.13	4.21
Clear instructions	4.43	4.62	4.78	4.54
Could explain role to friend	4.52	4.48	4.48	4.42
Socially appropriate choice	2.04	2.00	1.96	1.92

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Mrs Yanru Ouyang <yanru.ouyang@mq.edu.au>

Tue, May 6, 2014 at 11:38 AM

Cc: A/Prof Tony Bryant <tony.bryant@mq.edu.au>, Mr Matthias Oldham <matthias.oldham@students.mq.edu.au>, Mr Przemyslaw Pawel Chapko <przemyslaw.chapko@students.mq.edu.au>, Mrs Meg Bhasin Sambyal <mahak.sambyal@students.mq.edu.au>, Mr Jian Zhang <zhangjianalex@gmail.com>

Dear A/Prof Bryant,

Re: 'A Dictator Game with take-option and two types of recipient.'

Reference No.: 5201400413

Thank you for your recent correspondence. Your response has addressed the issues raised by the Faculty of Business & Economics Human Research Ethics Sub Committee. Approval of the above application is granted, effective "6/05/2014". This email constitutes ethical approval only.

This research meets the requirements of the National Statement on Ethical Conduct in Human Research (2007). The National Statement is available at the following web site:

http://www.nhmrc.gov.au/_files_nhmrc/publications/attachments/e72.pdf.

The following personnel are authorised to conduct this research:

A/Prof Tony Bryant
Mr Jian Zhang
Mr Matthias Oldham
Mr Przemyslaw Pawel Chapko
Mrs Meg Bhasin Sambyal

NB. STUDENTS: IT IS YOUR RESPONSIBILITY TO KEEP A COPY OF THIS APPROVAL EMAIL TO SUBMIT WITH YOUR THESIS.

Please note the following standard requirements of approval:

1. The approval of this project is conditional upon your continuing compliance with the National Statement on Ethical Conduct in Human Research (2007).
2. Approval will be for a period of five (5) years subject to the provision of annual reports.

Progress Report 1 Due: 6th May 2015
Progress Report 2 Due: 6th May 2016
Progress Report 3 Due: 6th May 2017
Progress Report 4 Due: 6th May 2018
Final Report Due: 6th May 2019

NB. If you complete the work earlier than you had planned you must submit a Final Report as soon as the work is completed. If the project has been discontinued or not commenced for any reason, you are also required to submit a Final Report for the project.

Progress reports and Final Reports are available at the following website:

http://www.research.mq.edu.au/for/researchers/how_to_obtain_ethics_approval/human_research_ethics/forms

3. If the project has run for more than five (5) years you cannot renew approval for the project. You will need to complete and submit a Final Report and submit a new application for the project. (The five year limit on renewal of approvals allows the Committee to fully re-review research in an environment where legislation, guidelines and requirements are continually changing, for example, new child protection and privacy laws).

4. All amendments to the project must be reviewed and approved by the Committee before implementation. Please complete and submit a Request for Amendment Form available at the following website:

http://www.research.mq.edu.au/for/researchers/how_to_obtain_ethics_approval/human_research_ethics/forms

5. Please notify the Committee immediately in the event of any adverse effects on participants or of any unforeseen events that affect the continued ethical acceptability of the project.

6. At all times you are responsible for the ethical conduct of your research in accordance with the guidelines established by the University. This information is available at the following websites:

<http://www.mq.edu.au/policy/>
http://www.research.mq.edu.au/for/researchers/how_to_obtain_ethics_approval/human_research_ethics/policy

If you will be applying for or have applied for internal or external funding for the above project it is your responsibility to provide the Macquarie University's Research Grants Management Assistant with a copy of this email as soon as possible. Internal and External funding agencies will not be informed that you have approval for your project and funds will not be released until the Research Grants Management Assistant has received a copy of this email.

If you need to provide a hard copy letter of approval to an external organisation as evidence that you have approval, please do not hesitate to contact the FBE Ethics Committee Secretariat, via fbe-ethics@mq.edu.au or 9850 4826.

Please retain a copy of this email as this is your official notification of ethics approval.

Yours sincerely,

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