

Testing the ultimatum paradigm in a naturalistic setting: Does it replicate?

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ABSTRACT

R. BRANDON IRVIN: Testing the ultimatum paradigm in a naturalistic setting: Does it replicate?

(Under the direction of Joseph Lowman, Ph.D.)

Most samples of the Ultimatum game have been from college student populations. In Study 1 we replicated the Ultimatum game with two different populations: Male college students at a fraternity house and poor males at community kitchen. The results from the college students were similar to those that have been published in other similar studies. The results from the Community Kitchen were slightly different with these participants tending to make higher offers showing more altruism. In Study 2 we recruited similar college and poor samples but used a variation on the Ultimatum called the Dictator game and asked additional questions to illuminate the men's motivation for making altruistic offers in this economic situation. Again, the results from the college students were similar to previous reports using the Dictator game and the homeless population was more generous than expected. Implications for evolutionary hypotheses about human altruism are discussed.

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Testing the ultimatum paradigm in a naturalistic setting: Does it replicate?

If you walk around with bare feet for a few weeks you will develop calluses on your soles.

The callus-producing mechanisms – manufacturing numerous new skin cells when repeated friction is encountered – function to protect the anatomical and physiological structures of your feet from damage. If you ride around in your car for a few weeks, however, your car tires will not get thicker. (Buss, 1999)

Calluses illustrate one type of complex adaptive mechanism. An adaptation may be described as an inherited characteristic that came into existence through natural selection because it helped solve a problem of survival or reproduction during the period of its evolution (Tooby & Cosmides, 1992). Evolutionary theory offers explanations of how these adaptations may have arisen over the course of many generations. Humans, like other organisms before us, faced (and continue to face) a large number of adaptive challenges. These problems are varied, ranging from survival – regularly finding things to drink and eat, regulating our body temperature, and avoiding predators – to the problems of mating – selecting or attracting an appropriate and desirable mate. Since evolutionary theory argues that specific problems are more likely to be solved by specific solutions, complex human behavior is thought to show many evolved psychological mechanisms or modules that originally occurred to solve different types of problems rather than just the effects of a few generalized learning mechanisms. Evolutionary psychology attempts to understand these specific psychological mechanisms as evolved adaptations to specific environmental problems during the tens of thousands of years when all humans evolved and survived with Stone Age technology living largely as hunters and gatherers.

Of particular interest to evolutionary psychologists and many anthropologists are the mechanisms for cooperation that these highly social early humans evolved. Altruism especially has been studied as one of these mechanisms. As is true for other psychological mechanisms, there are multiple forms of altruism, some of which solve general, even universal problems, and some of which can be thought of as adaptations for specific problems. However, they all offered both survival and reproductive advantages to the individuals who possessed them in comparison to those who did not. Otherwise, evolutionary theory suggests that these individuals would not have been anyone's ancestors.

Brown (1975) defines altruism as the giving of aid in the form of arbitrarily defined goods or services to individuals of the same species who are not offspring or direct descendants of the donor and without direct or immediate benefit to the donor or its mate. If helping another individual involves some direct cost to the helper, then the helper is potentially at a disadvantage. A superficial understanding of evolution would suggest that altruism would be selected against in relation to purely self-interested behavior. However, if there can be genetically transmitted predispositions for altruism, there must be some benefits that make the original helping behavior biologically advantageous or, according to the principles of natural selection, the altruistic behavior would not have survived (Hamilton, 1964).

Thus, altruism toward strangers or more distant family members presents a paradox from an evolutionary point of view. How could something that is inherently a disadvantage to the long-term survival of the individual be beneficial to that individual's genes? In part to solve this problem Hamilton (1964) introduced the concept of inclusive fitness (also known as kin selection or kin altruism). Previous to Hamilton's concept, evolution was understood

only in terms of an individual's direct reproductive success. Inclusive fitness is the concept that if an individual aids relatives then that individual is helping those who share a portion of the individual's genes and thus, is promoting the survival of genes that he or she possess. Hamilton (1964) even proposed a formula to describe the circumstances under which a gene for helping relatives would grow and become stable in a given population. In this formulation, the costs to the helper must be less than the benefits to the person being helped times their degree of genetic relatedness ($b < rc$). In other words, an individual's genetic fitness is measured not only the survival and reproduction of its offspring, but also by the increase in survival of specific genes through relatives who share the same genes.

Trivers (1971) later extended these ideas about kin altruism to cover altruistic behavior outside of the family unit that would also be controlled by genes but not passed along via inclusive fitness. He stated that if altruism were directed at those who are willing to reciprocate that altruism, it is possible that the cost of providing help now is outweighed by the benefit that will be received at a later date, given those who are helped also share a gene for altruism. Therefore, members of the reciprocal relationship will have survival advantages not available to them if they acted without cooperation. Trivers defined reciprocal altruism as involving (a) a cost to the altruist, (b) a benefit to the recipient and (c) a significant delay between the original act and the time the recipient repays the altruist.

In 1981, Axelrod and Hamilton investigated a way to assess the advantages of cooperation mathematically. They used the well studied economic game called the Prisoner's Dilemma. The rules of the game are as follows: There are two players who are each given a choice to cooperate or defect with the other player. All decisions are made without information about the other player's decision. In this game they assigned points for

the possible outcomes. If Player A defects and Player B cooperates then Player A gets 5 points (temptation to defect or T) and Player B gets 0 points (called the sucker's payoff or S). If both cooperate then they each get 3 points (reward for cooperation or R) and if they both defect they each get 1 point (punishment for mutual defection or P). The points are arbitrary provided they follow the general formula $T > R > P > S$ and $R > (S + T)/2$. In any given circumstance it always pays to defect, in that, for a single trial defecting always yields more points no matter what the other player does. For example, if the other player cooperates and you defect you get 5 instead of the possible 3 and if the other player defects and you defect then you get 1 as opposed to 0 for cooperating. However, if both players defect then they get less than if they both cooperated; which is the dilemma.

To test different strategies in this game, Axelrod and Hamilton (1981) held a tournament to compare different strategies. Evolutionary theorists, biologists, ethologists and other scientists were invited to submit computer programs based on different strategies, which would compete against other computer programs in an iterated (the programs would play multiple trials against each other) series of Prisoner's Dilemma contests. The winning strategy was called the tit-for-tat strategy (it won in a second running of this tournament as well). The rules of the winning strategy were simple: Start by cooperating and then do exactly what the other player did in the previous trial every time. This strategy allowed the program to cooperate when the other programs did as well and to forgive previous attempts to be selfish while being able to punish new or continued attempts to be selfish by the other programs. If you accept that these models can represent real world problems then the success of the tit-for-tat strategy provided evidence that cooperation based on reciprocity can develop in an originally asocial world because of its ability to be more successful than purely selfish

strategies. Moreover, the tit-for-tat strategy described above was successful against multiple types of strategies. Interestingly, from a population perspective if enough of the strategies were tit-for-tat then the population would resist invasion by more selfish approaches. This supported the idea that a reciprocity strategy based on cooperation can not only develop, but also be evolutionarily stable, resisting the introduction of self-centered entities. This is a very simplified version of potential ways of interacting. In the real world it is much more difficult to assess who is defecting and who is cooperating which leads to much more complex strategies such as frequency dependent selection as well as the strategies that we will discuss later in this paper.

Like the Prisoner's Dilemma, the more recent Ultimatum game is an economic game that researchers, starting with Guth (1982), have used to assess what factors are important when looking at how humans share certain resources. The rules of the game are as follows: The researcher offers a small amount of money (\$10 is the usual amount) to a pair of anonymous participants. The researcher then asks one participant, the *Proposer*, to propose a split of the money to the other participant, the *Responder*. The *Responder* can either reject or accept the *Proposer's* offer. If the offer is accepted then they both receive their stated share of the proposed split. If the offer is rejected they both receive nothing. The participants are never in the same room with each other when proposing or responding to the split and never know exactly with whom they are paired. The game is usually played in an uniterated format where participants in a group (usually five) play against others in another room in only a single trial.

Under the assumption that the players are always rational (and thus selfish), game theory would predict that the *Proposer* would always offer the minimum possible amount to

the other player. Conversely, the *Responder* will always accept a small amount of money rather than giving it up to punish the *Proposer*. This game has been conducted many times with many different populations and the result predicted by game theory has never been found or even approximated (Diekmann, 2004; Lehmann & Keller, 2006; Oosterbeek, Sloof & Van de Kuilen, 2004; Thaler, 1988). The most common offer is routinely a 50/50 split and sometimes even more is offered to the unknown partner than kept by the *Proposer*. As predicted by game theory, most offers are accepted, however, offers lower than 30% are frequently rejected (Gintis, Bowles, Boyd & Fehr, 2003).

STUDY 1

The first study reported here takes a different approach to understanding this robust finding by investigating the Ultimatum game with low socio-economic status (SES) individuals rather than college students. The rationale for using a more ecologically valid population for the Ultimatum game is two-fold. The first is to more fully examine the Ultimatum findings within the broad culture of the United States. The Ultimatum game literature suggests that people react in slightly different ways depending on different permutations of the game (Cameron, 1999; Handgraaf, Van Dijk & De Cremer, 2003). Stake size, degree of anonymity, context, and culture have all been demonstrated to affect the game's results to some degree (Henrich, 2000). For example, *Proposers* tend to offer less to *Responders* when the stakes are higher. More anonymous designs (computer interface as opposed to group designs where subjects are told live persons in another room are accepting or rejecting offers) will tend to decrease offers as well. These permutations show how people to respond to different factors when engaged in economic decisions like the Ultimatum game. Still, even though these variables changes the average offers significantly, the most common

splits are still the 50/50 division (the modal offer in almost all studies) even though manipulations can lead relatively fewer individuals to offer it (Cameron, 1999; Handgraaf et al., 2003).

Culture offers an important context to the game because it is specific to the participants and not dependent on rule changes. Although culture is a broad term, recent Ultimatum game studies in other countries have attempted to identify what characteristics participants bring to economic games that are unique versus universal. In general, people from multiple geographic locations tend to behave similarly in the Ultimatum game. People tend to make similar mean offers and reject those offers seen as unfair (Henrich, 2000). In a recent meta-analysis of the Ultimatum game literature, Oosterbeek, Sloof, and Van de Kuilen (2004) found that people from different nationalities tend to offer the similar proposals, but their rates of rejection vary somewhat.

While the Ultimatum game has been used to study differences between countries, a broader sampling from a single culture (the United States) has yet to be explored (Fehr and Fischbacher, 2003). Certainly the poor here in the United States experience different economic pressures than poor individuals living in a third world country. Similarly, studying college students in European or Middle Eastern countries does not provide the same contrast as a comparison of two economic groups within the same culture. The current study helps illuminate how low SES individuals in our culture offer to share resources within the context of the Ultimatum paradigm.

Individuals who live in low SES populations here in the United States likely experience different survival pressures than the typical college student population. Investigating differences in how much altruism they show may give us a sense of how

individuals interact with their environment in order to develop altruistic versus self-interested strategies. The poor population may adopt an altruistic strategy more often due to both their differential survival pressures and a differential need for supportive relationships.

Alternatively, poorer individuals with a greater need for money may show the kind of rational self-interest originally proposed by game theory.

Many current biologists and evolutionary psychologists support the view that culture and environment can influence the expression of particular phenotypes (Gottlieb, 2007; Rutter, 2007). If this is the case then it would be likely that all people are genetically predisposed to altruism as a strategy, as evidenced by the multiple cross-cultural studies of altruism (Henrich, 2000; Oosterbeek et al., 2004; Packer, 1977), and their culture or environment can facilitate this expression or possibly suppress it. In fact, Fehr and Fischbacher (2003) go as far as to say that strictly gene based theories that do not include dependence on environmental factors (such as SES) cannot fully explain human altruism, which points towards the importance of understanding gene-culture co-evolution. This thesis hopes to offer a more complex illustration of the type of environments that facilitate human altruism.

The second part of our rationale to investigate the Ultimatum game in a low SES population involves the greater relevance for evolutionary theory of a study of altruism using this population. Evolutionary psychology argues that all current psychological mechanisms reflect the environment of evolutionary adaptedness (EEA) in which our stone aged ancestors evolved. Fitness and sexual selection pressures operating during the Pleistocene are thought to be responsible for much of the basic human nature underlying the cultural differences seen among the world's people today (Tooby & Cosmides, 1992). Environments and cultures can

change relatively rapidly, whereas evolution would have taken thousands of generations to develop these adaptations. Thus, we should see evolutionary time lags in which people today reflect adaptations designed for previous environments (Buss, 1999).

Just like any other adaptation, altruism experiences time lags as well. During the thousands of years of the EEA everyone faced more critical adaptive challenges regarding resources and the need for relationships with others to aid survival. Studying altruism among relatively privileged college students today offers a less realistic context than people for whom economic survival is more difficult. However, people in low SES populations— even in the affluent culture of the contemporary United States – when compared to more comfortable individuals may be experiencing survival pressures that are more similar to the population of individuals that were in the EEA when predispositions toward altruism and cooperation evolved. Therefore, using this population allows us to investigate in a more realistic context how people with greater needs share resources when they are limited. Thus, investigating how this population behaves under the conditions of the Ultimatum game is a better test of the possible value of human connections and thus for the long-term implications about the adaptedness of altruism in the EEA.

We hypothesize that a lower economic sample from a Community Kitchen (CK) will be just as generous when playing the Ultimatum game as the college students used in published studies. Even though their need for money is greater, the poor both need and often form important reciprocal relationships. Furthermore, for subjects who need the money the fear of rejection from the other player should also encourage 5/5 splits. Unfortunately, this initial study will not be able to shed light on the questions of why poorer subjects tend to show altruism. In the case of the Ultimatum game there could be multiple motivations. For

example, they might show altruism as a generalized strategy in order to foster reciprocal relationships or they could make generous offers because they are afraid that the other player will reject a more selfish offer. However, this initial replication with this population will allow us to see if greater financial needs affect altruism and whether game theory's predictions also fail to be supported in this context.

Method

To test our methods we first conducted a pilot study using college students to insure that our specific instructions as modeled on published studies were understandable and led to similar results. The instructions and procedures used are described first for the pilot college students and then for the CK sample. Data collected from both locations are also presented and compared.

Participants

In our pilot sample participants were members of a men's fraternity at a large university in the southeastern United States. They were all of European-American ancestry and of traditional college age. Except that the subjects were all male and that data were collected after a meal in their fraternity house, these pilot data were collected from similar subjects to those Ultimatum studies reported in the literature.

In our low SES group participants were 40 male patrons, of a local community kitchen sponsored by an interfaith organization, which showed up on a Wednesday for a free lunch. While no demographic information were taken, participants were all assumed to be low SES and most were African-American, although several (six to eight) were of European ancestry. Two or three were Latino, but each understood and spoke English well. Subjects appeared to be between 20 and 70 years of age with most between 30 and 50. None showed

signs of physical or mental impairment that would interfere with their ability to understand the instructions, to give informed consent, and to participate fully. If anything, the participants seemed especially eager to play the Ultimatum game and have a chance to earn money confirming the assumption that the money would be more important to this population than to college students.

Procedure

For the CK sample the procedure was as follows: While patrons were lining up to enter the food service line a verbal announcement was made inviting volunteers to participate in a survey after lunch. They were told everyone would earn a \$5 coupon for a local fast-food restaurant and have a chance to earn up to \$10 in cash. The recruitment script that was read to the potential participants is presented in Appendix I. Interested persons were given an admission ticket, which was used to be sure those who volunteered first would have the first opportunities to participate after lunch. Most everyone who heard the announcement seemed willing, even eager; to take a ticket and several subjects went to get friends to make sure they could also participate. When 40 subjects had volunteered no more were recruited. The participants were asked to meet the researchers in a nearby television room after they had finished eating. Once a group of 10 or so had assembled their tickets were collected and they were divided in half and led into separate rooms. The two groups were then read instructions describing the Ultimatum game and asked to give verbal informed consent. Everyone was told that just for coming to the research room they would receive a \$5 food coupon at the end of the survey or immediately if they chose to leave, which they were told they could do at any time. No one left early, everyone seemed to complete the procedures accurately, and all data could be used.

Instructions to the Ultimatum game were read to the group using the standard rules described above with \$10 as the total money available to divide. The exact instructions read to the participants are presented in Appendix II. All participants were told that they were the *Proposer* and that the *Responder* was someone in the group taken to the other room. The instructions stressed that the subjects would never be told any information regarding the identity of the person who accepted or rejected their proposed split. After subjects had turned in the forms on which they proposed their splits, they were told that the survey was over and that there had been a deception in that no subjects were going to be asked to accept or reject their offers. They were given their coupons and cash and seemed to respect our request that they leave the building and not tell anyone else about the deception until we had finished running all the subjects.

Because previous research found that there is very little variation among which size offers are accepted or rejected, information from the *Responder* was of less interest to the hypothesis being tested here. In effect, each room was given the same instructions and participants were asked only to propose splits.

For the pilot sample of fraternity men, the exact same instructions were given and the only difference in procedure was that we conducted the study after dinner and not lunch. Also, even though we read the same instructions, with this sample we did not compensate the participants with restaurant coupons or cash. If someone asked if they would really be paid at the end, we told that we wanted them to imagine that we would be giving them money. Because they understood they were helping us test procedures they seemed to understand why they were not paid and no one objected to this.

Results

For the results all data will be reported in terms of what was offered to the *Responder*. In our pilot sample of college students (n=25) we had 52% propose \$5.00 and one participant more to the *Responder* than he kept for himself (\$5.50). One person offered \$0 and the rest (10, forty percent) offered \$1-\$4. The mean offer for the fraternity house was \$3.78.

In our CK sample (n=41) the offers tended to be more generous. Seventy-six percent of this sample offered a \$5.00 and two people offered more than half (\$5.50 and \$8.00). Two people offered \$0 and the rest (6, fourteen percent) offered \$1-\$4. The mean offer for the CK sample was \$4.62.

Table 1

Offer	Frat House	Community Kitchen
\$8.00	0	1
\$5.50	1	1
\$5.00	13	31
\$4.50	1	0
\$4.00	0	4
\$3.50	1	0
\$3.00	3	1
\$2.00	2	1
\$1.00	3	0
\$0	1	2
Mean offer	\$3.78	\$4.62
Offer \geq \$5	56%	80%

Discussion

Our results for our pilot study were similar to those from reported studies using a college student population. Average results for the Ultimatum game in the eastern United States have individuals offering 40.54 percent of the monetary pie (Oosterbeek et al., 2004) where our pilot sample offered 37.80 percent. Fifty-two percent of our participants chose an equal 5/5 split and one made an offer that was more than an equal share. Many offers fell

between an equal split and zero. As is the problem with the original ultimatum studies, we cannot determine what the specific motivations were leading them to make mostly equal offers. However, at the very least our pilot data replicate what has been reported elsewhere and convincingly demonstrate once again; that people do not act according to what traditional game theory would predict.

All participants in our pilot sample seemed eager to participate. Many of them stated that they were interested in the problem of how much to give and everyone seemed to take the task seriously. Since the data was taken in larger groups (12 in each group) for the pilot sample and they were all involved in close fraternal relationships with one another, it is possible that this influenced them to make more fair offers than they would in groups of five strangers as is typical and was used in the CK sample. However, this seems unlikely since all data collected was anonymous and there is no reported evidence to suggest the size of the audience affects the size of the offers. The fact that the pilot sample did not play for real money could also have affected the size of their offers. However, because reported evidence suggests that there is no difference between hypothetical offers and real ones when playing the Ultimatum game (Cameron, 1999; Forsythe, Horowitz, Savin & Sefton, 1994; Handgraaf et al., 2003) this does not seem to have played a role in their offers. In sum, the pilot study showed that asking for volunteers before a meal and testing them in large groups in a non-laboratory setting afterward produced data quite similar to those reported in the literature using more usual subjects earning research credits and in controlled conditions.

We were gratified the CK participants seemed so eager to participate and invested in the Ultimatum task, suggesting that our assumption was accurate that the money would be a powerful reinforcer and that the Ultimatum paradigm could be studied in a natural

community setting. Although we did not do a formal evaluation in our debriefing, many participants commented on the experiment. They said they enjoyed the experience and thought the problem of how to divide the money was interesting. They seemed to pay attention during the instructions, asked questions that showed they understood the instructions and the dilemma they were facing, and laughed with pleasure when told about the deception and realized that no one would be accepting or rejecting their proposal. Not surprisingly everyone seemed pleased to receive the full \$10 in cash along with the restaurant coupon. All these informal observations suggest that everyone both understood and took the task seriously.

Many of the participants also volunteered their reasons for proposing the divisions that they did. The most common rationale for offering an even split was that it was “the only thing to do” or “the right thing to do.” This indicates that some of the individuals had internal beliefs about fairness and trade with other persons that seemed clear to them. The other reason frequently offered by the Community Kitchen (CK) sample was that they were afraid that the other player would reject their offer, leaving them with no money. Several of them offered specific reasons they needed the money that day, suggesting that for them the fear of not getting any of the \$10, i.e. having their offer rejected, was more to be avoided than the desire to gain as much as they could. For example, a couple of subjects mentioned that they proposed an even (or offered more than a \$5) split because they wanted to be sure that they had the few dollars needed for a bus ride home to a nearby city.

The range of offers proposed by the subjects recruited from the CK sample indicate that the homeless population was as generous, if not more so, than our college student population as seen by the fact that seventy-six percent of them proposed equal splits as

opposed to fifty-two percent from the pilot sample. An initial interpretation of these data might suggest that the CK population was more likely to show altruism even though their need for the money was surely greater. Even though their attributions were not assessed systematically, unsolicited comments from the CK subjects suggest that two rationales were influencing their proposals: an internal sense of fairness and a concern with risk aversion. These alternative theoretical explanations have been discussed by others.

Falk and Fischbacher (2006) claim that offers in the Ultimatum game are motivated by two factors: 1) strategy and 2) internal beliefs about fairness. These two motivations can be broken down further to illuminate possible motivations for the participants in our study. In terms of altruism, the fundamental problem facing every potential altruist is weighing the immediate value of a given resource versus the value of giving up that resource to help secure a future advantage or helpful relationship. When developing strategies for giving or trading resources one must consider the indirect or future benefits which may prove to be more valuable than the resources relinquished. First, he or she may consider the role of the resource in cultivating a reciprocal trade relationship for the future. Second, even though the proposal was not made public the potential altruist's reputation is a valuable resource and one may consider how his or her offer could enhance or denigrate his reputation. Third, all of these long-term needs should be balanced against the utility of keeping the money for use in the short-run. Finally, as previously mentioned, the possibility of rejection from the other player needs to be estimated and entered into the calculation of what proposed split is in an individual's best interest.

First, we must look at the offers from a strategic perspective. For those that have very little money, coming away from this game with no additional money would be a very

negative consequence and one to be avoided. Thus, it is possible that our CK population simply made fair offers due to a heightened fear of rejection because of their increased need for money. This explanation of their greater proportion of equal splits might be better called risk or loss aversion than altruism and is consistent with the original rational prediction from game theory.

On the other hand due to the scarce resources among this population the need for reciprocal relationships that would offer them a variety of advantages from informal trade or mutual support is probably greater as well. This would imply that the fair offers are due to an internalization of preferences for fairness based on the relative success of the fairness strategy in the past which would allow them to maintain reciprocal trade and supportive partners (i.e. “always treat others fairly so they will treat you fairly”) of the kind talked about as adaptive in prehistoric relationships long before economies based on symbolic resources such as money originated. It is possible that many of the men in this first study had learned to survive by actively cultivating reciprocal relationships and being concerned about their reputations as fair individuals who would treat others fairly.

Whether in the informal bartering economies of hunter-gatherers or in the modern world of business based on formal contracts, one’s reputation is a valuable resource and essential to the sense of trust that facilitates trading relationships (Semmann, Krambeck & Milinski, 2005; Wedekind & Braithwaite, 2002). In previous studies of the Ultimatum paradigm, when the experimenters remain in the room offers were significantly higher as opposed to when they were out of the room even though the participants were assured that the offers were anonymous (Kurzban, DeScioli & O’Brien, 2007). The desire to act fairly to maintain a good reputation may be so ingrained that even implicit cues can affect offers in

bargaining games. For example, Kurzban (2001) found that when participating in a public goods game, all male groups were more likely to cooperate when they shared a mutual eye gaze before they made their decision even if no other information (verbal or non-verbal) was exchanged. In a particularly clever study, Haley and Fessler (2005) conducted a game similar to the ultimatum game in which participants used a computer to record the data in order to insure anonymity. In one group the background of their screen was blank and in the experimental group the background contained a set of stylized eyes. They found that the implicit cue that someone might be watching them (stylized eyes) significantly increased the offers made to the other player. Although we did not specifically test for the effects of reputation on the size of the offers, these previous studies would suggest that since the data in Study 1 was collected in groups, even though written down on a piece of paper anonymously, participants might have been more likely to give fair offers due to a sense of possible surveillance.

It should be noted that the previous samples used were mixed gender. It is possible that having an all male sample could have changed the results, however, much of the literature on sex differences in altruism is inconsistent (Andreoni & Vesterlund, 2001). Most evidence of gender differences in altruism depends on slight rule changes. For example, Solnick (2001) found no gender differences in offers made when the recipient was anonymous. However, men tend to receive higher offers, especially from women, when the gender is known. Andreoni and Vesterlund (2001) found that women tend to be more generous when the price of altruism is higher and men tend to be kinder when the price of the game is low. In a two part dictator game, Ben-Ner, Putterman, Kong, and Magan (2004) found that women tended to give more when others were generous to them, but men tended

to give more independent of their partner's generosity. These mixed results do not give us any indication that either gender should be considered more generous or altruistic. It is possible that offers differed due to the gender of our sample, but we still should be able to compare our data with previous published results.

The first study of the Ultimatum game in a community kitchen provides ecological validity to this paradigm as a way of studying altruism in a community sample, which strengthens the generalizability of the results, but the lower degree of experimental control may have reduced our understanding of the specific motivations the subjects had for making fair offers. Specifically, we cannot be sure how much their decision to be fair to the other player was due to an internal commitment to altruism or fear of rejection from the other player and the anticipated loss of the needed money. Both motivations – internal beliefs about altruism and fairness or fear of rejection – could have produced the same result even though the implications for evolutionary theory would be different. The modifications of our procedures as proposed in Study 2 are designed to provide better understanding of these important theoretical questions.

STUDY 2

In the previous experiment we saw that, like college students, the CK population most often proposed an equal split when the standard version of the Ultimatum paradigm was used. As was true for previous studies of the Ultimatum game, evidence from Study 1 suggests that even in a low SES population rational self-interest is unable to predict the splits that are typically proposed. An additional study of another lower income sample using a procedural modification was used to illuminate the extent to which an internal sense of fairness is more important than a fear of rejection as the cause of the mostly equal splits.

Researchers have reported a modified version of the Ultimatum game, called the Dictator game that is designed to test the extent that risk aversion plays a role in the altruism so robustly found in the Ultimatum. The Dictator variation is played in exactly the same fashion with one key difference; the *Proposer* is told that the *Responder* has no power to accept or reject the offer. This one rule change removes the element of strategy in the decision of how much to give. According to Falk and Fischbacher (2006), this leaves only the internal sense of fairness of the player making the proposal as a possible motivator for offering an equal split to the *Responder*. Thus, the Dictator variation eliminates the fear of rejection as a motivator.

Mean offers tend to be much lower and the offers are more variable in the Dictator game compared to the Ultimatum game. Approximately 80% of the offers are between zero and half the total money being divided. About 20% of the offers are zero (Falk & Fischbacher, 2006). Some studies found a bimodal distribution with offers clustering around 50% and zero (Haselhuhn & Mellers, 2005). Still, data collected in the Dictator game show on the whole that 50/50 splits are still common and are the mode in many studies.

The objective of this second student sample was to test the Dictator game in the same two populations as reported in Study 1. If strategy or risk aversion was a powerful influence then we would expect the results of the Dictator and Ultimatum games to vary widely in these similar populations with lower offers in the Dictator game. However, if fairness, reputation and reciprocity were more important we would expect to see little difference when comparing the two games.

Specifically, we hypothesized that the CK subjects will be equally as generous as samples from previously reported studies of the Dictator variation due to their desire to

obtain and maintain reciprocal trade partners. We predicted the distribution would resemble a bimodal distribution with high proportions of individuals giving \$5.00 and \$0. Despite the need for the money and desire for the immediate payoff, we predicted that the CK sample would be as likely to select the altruistic strategy as previous studies of the Dictator game using college students because they have learned that the long-term strategy of treating others' needs as important is superior to the short-term strategy of keeping all or most of the money even when one has limited resources. For example, in Study 1 some individuals volunteered their motivations for making generous offers by saying, "It's the right thing to do" or "It's the only thing to do." Furthermore, by comparing data once again collected from college students and CK subjects we were able to compare any discrepancies between Ultimatum and Dictator conditions for the two populations who vary in their need for the money at stake.

Method

Participants

We used samples similar to those used in Study 1. Because we used a deception in Study 1, we could no longer use the same fraternity house and community kitchen that we had visited recently. Even though everyone in this Dictator game was told they would receive the splits they propose regardless of the *Responder's* acceptance, it was important for all subjects to think there really was another person who would benefit or lose from what they propose. Thus, each subject saw a second group go into a different room to emphasize that it was real people similar themselves with whom they were proposing to share the money.

Our college student sample was from a different fraternity on the same campus who were screened to be sure that they had never heard of our first study. They were all of European-American ancestry and were college aged. Except that the subjects were all male and that data were collected after a meal in their fraternity house, these pilot data were collected from similar subjects to those Dictator studies reported in the literature.

Our CK sample was from a different community kitchen in a town about 10 miles away. While no demographic information was taken, participants were all assumed to be low SES and most were African-American, although several (six to eight) were of European ancestry. Two or three were Latino, but each understood and spoke English well. As in the first CK group, subjects seemed to be between 20 and 70 years of age with most between 30 and 50. No one showed signs of physical or mental symptoms that would interfere with their ability to understand the instructions and to participate fully.

Procedure

The Dictator game procedure was a simple variation of the Ultimatum game that was described in Study 1. The *Proposer* was allocated \$10 to split between himself and the *Responder* but he was told this time that the *Responder* must accept the *Proposer's* offer. He was told that he and the *Responder* will receive the amount of money he proposes. In effect, all power is taken from the *Responder*.

One additional modification was made to the previous study. At the end we asked about their motivations for offering the split they did using one open-ended question as well as four specific survey questions that were answered on a five point Likert scale. This enabled us to formally assess their motivation for offering different splits to help us

understand the theoretical implications of the data since our use of the Dictator format was designed to tease out risk aversion versus internal sense of fairness as motives.

Results

Once again, all data are reported in terms of what was offered to the *Responder* by the *Proposer*. In our fraternity sample (n=11) we had forty-five percent propose at least \$5.00. Three participants offered \$0 and the rest (three, twenty-seven percent) offered between \$1 and \$4.50. The mean Dictator game offer for the fraternity house was \$3.13.

Our CK sample consisted of only 39 subjects because one subject could not read and it did not appear to have understood the instructions and his data were discarded. Among the CK group the offers tended to be more equitable than in the fraternity. Sixty-six percent of this sample offered at least \$5.00. Nine people offered \$0 and the rest (five, thirteen percent) offered between \$1 and \$4. The mean offer for the CK sample was \$3.59.

Table 2

Offer	Frat House	Community Kitchen
\$6.00	0	2
\$5.00	5	23
\$4.50	1	0
\$4.00	1	2
\$3.00	0	0
\$2.00	0	2
\$1.00	1	1
\$0	3	9
Mean offer	\$3.13	\$3.59
50% splits	45.45%	65.79%

After they had turned in their offers we also solicited their subjective attributions for why they made the offers that they did. We first asked one open-ended question, “Why did you choose to make the offer that you did?” followed by four other focused questions that were answered on a Likert scale (Appendix III). The answers to the open-ended questions

were then categorized into specific attributions based on how generous a split was proposed. Of the 23 participants who offered \$5.00, 13 reported that they did so out of fairness (or some variant thereof), 6 reported that it was the “right” or “Christian” thing to do, 2 stated a variation of the golden rule, 1 stated that he was a “good person,” and 1 stated that he did not deserve more than the other participant. Of the 2 participants who offered \$4.00, 1 stated that it was the right thing to do and 1 reported that he offered \$4.00 out of a sense of fairness. All of the participants who offered \$2.00 or less reported that they did so because they “wanted” or “needed” the money for some reason. Interestingly, of the 2 people that made offers greater than \$5.00, they reported that they made these offers because they did not need the money and preferred to give it away.

Discussion

Our results from the CK sample for the Dictator variation of the Ultimatum game indicate that the homeless population was even more generous than expected. In our sample 65.79% of CK participants offered at least \$5.00. While this is lower than 80% of the CK sample who played the Ultimatum game, some previous studies of the Dictator game show lower mean offers and fewer participants offering at least \$5.00 as compared to our sample (Eckel & Grossman, 1996; Hoffman, McCabe, Shachat & Smith, 1996). Falk and Fischbacher (2006) stated that approximately 80% of offers are as follows: $0 < x \leq 5$. In the CK sample 30 of 39 offered more than \$0 (77%) with most offering at least \$5.00. Once again, the fraternity sample chose offers that were close to other samples of college aged participants.

These results indicate that risk aversion appears to play only a small role in the decision to split money in single trial anonymous interactions for our CK sample. In fact, it

seems that an internal sense of fairness plays a large role in these types of interactions with this population. Previous studies have shown that among college student populations many people tend to give away a significant share of the monetary pie in the Dictator game even though there are no direct advantages to themselves. According to our results, the same is true for the poor, except they tend to give away even more despite their scarce resources.

At first glance the CK sample seems to have adopted a poor strategy for coping with limited financial resources. If we were to look at only this particular interaction then it is clear that the best rational decision is to keep all the money. Why then do people for whom money is a rare commodity give a portion away to an anonymous other? One possibility is that the self-interest genotype that was adaptive in the EEA is maladaptive in our current environment and this is a situation where the adapted mechanism is no longer effective. However, if we adopt an indirect evolutionary approach first proposed by Guth and Yaari (1992), we can assume that players behave according to their given preferences, but that these preferences can change depending on their relative success. It is essential to understand that this theory requires environmental input and learning as an essential part of our preferences for fairness. In the case of the Dictator and Ultimatum games, the CK population clearly has a strong preference for fairness, which could have been molded by previous experience as well as genetic predisposition. Since these preferences are based on *relative* success, the strategy that protects a sense of fairness can be maintained if it pays off more often than it does not. Also, the single-trial, anonymous interaction modeled here is probably rare among a highly interdependent homeless community. Even though an attempt was made to increase ecological validity of this paradigm by testing it in a more economically relevant community sample, the single trial format fails to capture what

reciprocation is in real life. In reality these men's lives would have likely been characterized by mutual interdependence with others and this would not allow for the rational isolation of the consequences of each decision. The CK sample results being extremely generous lend support to this model that accounts for more general preferences as opposed to a purely genetic or strictly rational one. It seems most likely that their environment fosters an atmosphere that rewards individuals who maintain reciprocal trade partners which would result in more individuals adopting preferences for fairness.

We must also consider that it is also possible that the offers were more equitable because the *Responders* were poor instead of the assumption that our participants were using a particular learned strategy. To test our current hypotheses we chose to have all participants see that the *Responder* was within their own community which allowed for a more naturalistic environment, but this caused differences between levels of income between the two groups of *Responders* and it is possible that the increased generosity in the CK sample was simply due to the income of the *Responders*. Branas-Garza (2006) found that subjects tend to give more of the allotment when they know the *Responder* is poor as opposed to a no information condition. On the other hand, this "poverty" effect could partially be explained by the fact that the control for this experiment was a group that received no information and this may seem less real to participants. Frohlich, Oppenheimer, and Kurki (2001) reported that if information is not given about the *Responder* then the *Proposers* often believe that the experiment is not real and offers tend to be less generous. Also, this effect should be balanced by the fact that the *Proposers* are poor as well in our study.

Again it should be noted that the sample was all male as opposed to previous studies that were primarily mixed gender. As mentioned above the data on gender differences is in

altruism inconsistent and this remains true for the Dictator game. For example Bolton and Katok (1995) found no differences in giving based on gender in a Dictator game where Eckel and Grossman (1998) found women gave twice as much as men in a Dictator game.

Finally, our descriptive study was a positive first step in understanding the expression of altruism for a population that had previously not been studied. One possible line of study for future research would be to continue researching the homeless population. One possible step in this area of research is to deepen our understanding of which environmental variables are associated with differential levels of altruism. In the current study we found that SES did not negatively impact the generosity of individuals when they knew that they were giving to other poor individuals. We could conduct this study with the homeless population and use more affluent individuals as the second player. This would allow us to see if their preferences for fairness are more general or specific to their own population. If they are only generous to their own population this would indicate that a strategy that is dependent on a population that would reciprocate is in play. Another area of altruism research with the homeless population could be to conduct Ultimatum and Dictator games with different rules (similar to what previous authors have done with college students) to test different types of altruism in the homeless population. For example, we could conduct a design with more perceived anonymity to see if the perception of being watched affected giving behavior. Another possible line of research would be to conduct a novel experiment in the lab setting using college students. For example, a recent article primed for God concepts before they conducted the Dictator game (Shariff & Norenzayan, 2007). We could attempt to trigger different implicit cues to see what which ones prime us for more generous behavior. There

are many opportunities to continue this line of research that have an impact on how to encourage prosocial behavior in the United States.

Appendix I

Recruitment Script

Today we're looking for volunteers to help us with a very short survey for a research study right after dinner. It will take only 10-15 minutes but you need to be able to understand English. Raise your hand if you want to help us after dinner. We'll give you a ticket now to show you've volunteered. We'll call for you after dinner and walk downstairs in a group for this very short survey. We'll tell you more about the study then but all we want you to do is answer two short questions. Please let us know if you have any questions.

Appendix II

Instructions

Thanks for volunteering to participate in our survey today. You can earn up to \$10 that will be paid to you in cash at the end. You can stop at any time, but if you leave early you won't get a chance to earn any of the cash.

Like other research studies we are hoping to learn something new. Your participation is important to understand how people in general propose dividing things, but you may not benefit personally from the information we learn from the research study. If you decide to be in this study, you will be one of about 30-40 people that will be helping us today. Your participation will take about 15-20 minutes. You can choose to stop at any time.

In this survey each of you will be paired with one of the people who went in the other room. You will not be told who that person is, not now or after the survey. And they will not be told who you are either. Because we will only use a participant ID instead of using your name, no one will know what you write down; everything is private.

The study will work this way: Today we brought along \$10 to give to you and the person in the other room who has been paired up with you. Because you came into this room you get to propose how much of the \$10 each of you is to receive. Your partner in the other room has to decide whether to accept or reject your offer. All you do is fill out the form titled "Proposal Form."

(Every one is now given a Proposal Form and a pencil). As you can see, the first line of this form shows your identification number. The identification number of the person you are paired with is on line 2.

You will not be paired with any of the other people in this room. And we will not show anyone in this room what other people put down on the survey. Different people write different things on the surveys and we don't want you to show your form to the others.

Here's the most important part. You get to decide how you want to split the \$10 with the person in the other room. Remember you don't know who he is, he doesn't know who you are, and neither of you will find out you were paired. You can offer any split you wish from keeping all the money for yourself, giving all of it to him, or any splits in between. Your offer has to add up to \$10, however. If you have questions about how to do that we'll help you.

After we take your paper in the other room and tell your partner how you wanted to split up the \$10 he gets to decide whether to take what you offer or turn it down. If he decides to take your offer each of you gets what you proposed, no matter what it was. If he decides not to take it, then neither of you gets anything. You will have 5 minutes to make your decision.

We understand that making this decision about how much to offer the other person may be hard to do. That's OK. Some people find it harder than others and some take longer to decide. You don't have to propose a split if you don't want to. You can just leave now and we'll give you the Subway coupon outside the room. Understand that you won't get any of the \$10 if you decide to stop now.

Do you have questions or concerns now? *(Wait for questions or requests for clarification. The explicit verbal consent comes next. If anyone chooses to leave they will be given a fact sheet with their Subway coupon after they leave the room.)*

Does everyone still want to take the survey? *(Wait until eye contact is made with everyone to be sure they wish to proceed. The Fact Sheets that subjects will take with them will be distributed at the end with the Subway coupons and cash.)*

OK, let's begin. Just take a minute or so to decide what you want to do. When you've decided just write down on line 3 how much you want to keep for yourself and how much on line 4 you want your partner to get. Remember, if he decides not to take your offer then neither of you get anything.

After you have decided how much to propose raise your hand and one of us will collect your proposal form. When everyone is finished we'll take them in the other room and see what you partners say about your proposed split. Please don't talk to the other people in this room until everyone has finished. And don't be concerned if other people make their decisions before you. Take your time.

Appendix III

Strongly Agree	Agree	Neither	Disagree	Strongly Disagree
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1	2	3	4	5
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1. I made this offer because I was concerned about my reputation.

1	2	3	4	5
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2. I made this offer because I thought it was fair or the right thing to do.

1	2	3	4	5
---	---	---	---	---

3. I made this offer because I wanted to keep as much money as possible.

1	2	3	4	5
---	---	---	---	---

4. I made this offer because if someone found out I made an unfair offer then they would not cooperate with me in the future.

1	2	3	4	5
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