ALTRUISM AMONG RELATIVES AND NON-RELATIVES

Howard Rachlin

Stony Brook University

& Bryan A. Jones

University of Arkansas for Medical Sciences

Address Correspondence to:

Howard Rachlin
Psychology Department
Stony Brook University
Stony Brook, NY 11974

Phone: 212-996-3478
e-mail: howard.rachlin@sunysb.edu

Altruism has been defined as "costly acts that confer economic benefits on other individuals."[1] Since people may be more or less altruistic in a given situation, this definition implies that someone who willingly incurs a greater cost in order to confer a fixed economic benefit on another person or group is more altruistic than one, in the same situation, who is willing to incur only a lesser cost for the same economic benefit to another person or group. Altruism, understood in this way, has been measured by presenting people with a series of hypothetical choices between a fixed amount of money (usually $75) for other people at varying social distances, and a usually lesser amount for themselves; the amount of money for themselves equal in value to $75 for the other person (the "crossover point") measures altruistic tendency or "generosity."[2, 3] Here we show not only that relatives tend to be placed at closer social distances than non-relatives but also that, at the *same* social distance, people are willing to forgo significantly more money for the benefit of relatives than for the benefit of non-relatives. Altruistic behavior thus depends on both social distance to, and degree of relatedness to, the object of that behavior.

In prior experiments, crossover points were obtained for people at various social distances from the participant. Social distance was defined as numerical order in closeness, to the participant, of person-N (N = 1 being the closest, N = 2 being the second closest, and so forth). The crossover point represents the maximum amount of money a participant was willing to forgo (the "cost") in order to give $75 ("the economic benefit") to person-N.

METHOD: Participants (206 Stony Brook University undergraduates) were first asked to imagine that they had made a list of 100 people ranging from their closest friend or relative at *N* =1 to (possibly) a distant acquaintance at *N* =100 (but not to actually make the list). At each *N*-value participants made a series of choices between descending or ascending amounts of money for themselves and $75 for person-*N*. The crossover point was the monetary amount for themselves at which their preference changed ("crossed over") from a descending amount for themselves to $75 for person-*N* or from $75 for person-*N* to an ascending amount for themselves. Crossover points were obtained for each participant at 7 *N*-values (*N* = 1, 2, 5, 10, 20, 50, 100) presented in random order.

Prior to choosing, participants were asked to think of a specific person at each *N*-value tested. After each crossover point was obtained, participants filled out a questionnaire asking for person-*N*'s relationship to them (mother, father sister, brother, boyfriend, girlfriend, neighbor, roommate, etc.), how many years they had known person-*N*, and other demographic information about person-*N*.

Inset Figure 1 here

RESULTS: The solid circles in Figure 1 are overall median crossover points. The greater *N* was, the less money participants were generally willing to forgo at the crossover point. That is, altruism was *discounted* by social distance (Rachlin, 2006). Equation 1, a hyperbolic discount function (of the same form as delay and probability discount functions)[4, 5] provided moderately good fits to *individual-participant* crossover points (mean R^2 = .811), and an excellent fit to the *median* crossover points (R^2 = .997):

$$v = \frac{V}{1 + k_{social} N} \quad (1)$$

where V = the undiscounted reward value; v = the crossover point; k_{social} = a constant that varied across individuals. Because, as is typical in social discounting procedures, many participants preferred \$75 for others at N = 1 or N = 2 to \$75 for themselves, V was not fixed at \$75 but was allowed to vary along with k_{social}. For the median data, V = \$87.2. The greater was a person's k_{social}, the steeper her discount function, the less altruistic she was.

Taking a cross-section at each N-value, crossover points for relatives (coefficient of relationship ***r*** ranging from .5 for parents and full siblings to .03125 for second cousins) were separated from crossover points for non-relatives (defined as those with ***r*** < .03125)[6]. As expected, there were much higher percentages of relatives at low than at high N-values. The percent of relatives placed at N = 1, 2, 5, 10, 20, 50, and 100, was 72, 79, 50, 39, 28, 17, and 5 respectively.

The open squares and triangles in Figure 1 are medians, at each N-value, of the crossover points for relatives and non-relatives separately. The upper dashed line is the fit of Equation 1 to the medians for relatives (R^2 = .925; k_{social} = .034; V = 82); the lower dashed line is the fit of Equation 1 to the medians for non-relatives (R^2 = .982; k_{social} = .083; V = 84). The crossover points for relatives are significantly higher than those for non-relatives. In an independent t-test ($t(1004) = 14.319$, p = .000).

From Figure 1 alone, it is not possible to say that any given participant was willing to give more money to relatives than to non-relatives. It is conceivable that participants who put more relatives on their lists were just more generous overall than those who put fewer relatives on their lists. To test whether higher generosity towards

relatives than non-relatives holds within individuals, we determined, for each participant at each *N*-value, the signed (+ or -) deviation from the mean crossover point at that *N*-value. Then, for each participant, we averaged the deviations for relatives separately from the deviations for non-relatives. (Across participants, the average deviation from the mean for relatives was +0.365 and for non-relatives was -0.144 as expected on the basis of Figure 1.) Then, *again for each participant individually*, we subtracted average deviation for non-relatives from that for non-relatives. (The data of participants who cited only relatives or only non-relatives at all *N*-values were ignored.) Let us call this the "deviation difference." A positive deviation difference for any individual indicates that that individual's crossover points were generally higher for relatives than for non-relatives. Across, participants the average deviation difference was +0.471, significantly above zero [$t(191) = 3.249$, $p = .001$] showing that individuals were more generous toward relatives than non-relatives.

Insert Figure 2 here.

Among relatives, participants tended to give more money to closer than to more distant ones. Figure 2 shows the fraction of $75 that was forgone so as to give $75 to a relative as a function of the coefficient of relatedness to that person (irrespective of social distance). Note that the slope of the function overall is greater than 1 (dashed line at slope = 1) and that participants preferred $75 for their closest relations (***r*** = .5) to amounts greater than $75 for themselves (point above the dotted line) even though they presumably could have taken the higher amount, given $75 to their parent or sibling, and

kept the difference. Perhaps this economically irrational stated preference was merely a way of differentiating their *very* closest relatives, those to whom the bonds of obligation were strongest, from the rest.

DISCUSSION: The fact that people are more generous to their relatives than to non-relatives is not surprising, but the fact that, even after social distance has been taken into account, they are more generous to their relatives than to their non-relatives, is somewhat surprising. Of two people at the same social distance, one a relative and the other a non-relative, participants were willing to forgo less money for the benefit of the latter. This finding implies that there are factors other than social distance that determine altruistic behavior. We can only speculate what those factors may be. One possibility is that social distance itself is multiply determined. You might feel close to a friend because he or she is an entertaining person and fun to be with, but still not be willing to give him money. You might feel indebted to a relative. Or, a relative, even one you might not like much, may be more likely to reciprocate your altruism than a friend would be, even at the same social distance. But this possibility complicates the definition of altruism with which we started: "…costly acts that confer economic benefits on other individuals." When the "costly acts" are actually investments from which a return is expected, they are less costly than their nominal amounts and, to that degree, less altruistic.

REFERENCES

1. Fehr, E. & Fischbacher, U. The nature of human altruism. *Nature*, **425**, 785-791 (2003).

2. Jones, B. & Rachlin, H. Social discounting. *Psychological Science*, **17**, 283-286 (2006).

3. Rachlin, H. & Jones, B. Social discounting and delay discounting. *Behavioral Decision Making* (in press).

4. Green, L. & Myerson, J. A discounting framework for choice with delayed and probabilistic rewards. *Psychological Bulletin*, **130**, 769-792 (2004).

5. Rachlin, H. & Jones, B. Social discounting and delay discounting. *Behavioral Decision Making* (in press).

6. Wright, S. (1922). Coefficients of inbreeding and relationship. *American Naturalist*, **56**, 330.

Acknowledgement

This research was supported by a grant from the U.S. National Institute of Mental Health.

FIGURE LEGENDS

1. Social discount functions separated for relatives and non-relatives. The upper and lower dashed lines are Equation 1 fit to median crossover points for relatives (open squares) and non-relatives (open triangles). The solid line is Equation 1 fit to overall median crossover points (solid circles). The error bars are standard errors of the mean for the overall crossover points.

2. Median fraction of $75 participants were willing to forgo so as to give a relative $75 as a function of their coefficient of relatedness. The dashed line is the locus of equality. The error bars are standard errors of the mean.

Figure 1

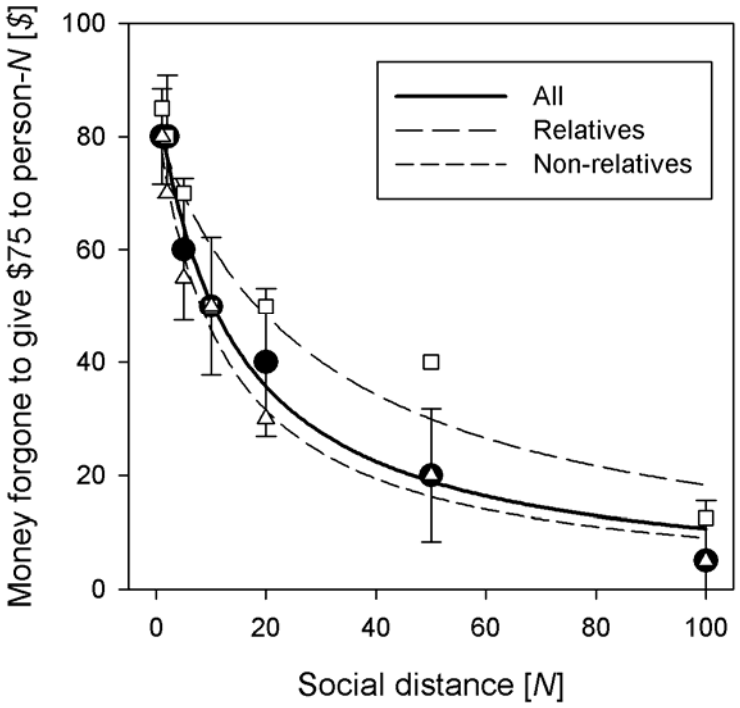

Figure 2