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Psychological aspects of adaptations for kin directed altruistic helping behaviors
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Abstract

A questionnaire study sheds light on the psychological component of kin selecting

tendencies predicted by Hamilton's (1964b) inclusive fitness theory of discriminatory

altruistic behavior based on genetic similarity. Participants rated donations of assistance

aiding survival and material wealth as more rational and ethical when these actions were

performed for closer relatives. Participants also felt a greater obligation to perform these

acts for a close relation. A comparison condition where assistance was unlikely to affect

survival or reproductive success did not exhibit these tendencies.

Psychological aspects of adaptations for kin directed altruistic helping behaviors

Speculation on altruism reflects on the fundamental character of human nature. Philosophers throughout the ages have debated the question of whether humans actually intend to perform actions that are beneficial to others and costly to themselves, without any clear resolution (Cialdini, Brown, Lewis, Luce, & Neuberg, 1997). Social psychologists continue this debate. Although some argue that the experience of empathy for others leads to truly altruistic actions (Batson et al., 1997), others believe that conditions leading to empathic concern also lead to a greater sense of self-other overlap (Cialdini et al., 1997). Thus, helping others leads to a more favorable mental state because it is at least partially self-directed.

Helping and altruism may also be approached through the framework of evolutionary theory. Classical (Darwinian) fitness is the probability that individuals will successfully reproduce by passing on their genes to future generations through direct offspring. Members of a species that sacrifice their resources for the benefit of others beyond spouses and offspring would on average have fewer successful descendants, thus an inherited tendency for this behavior would not spread through the population. Hamilton's inclusive fitness theory (1964b) expanded the basis of reproductive success to include close relatives who become ancestors of offspring with similar genetic material.

A genetically influenced tendency to favor relatives with assistance is likely to spread across a population when the cost in reproductive fitness to the donor is less than the product of the fitness benefit to the recipient(s) and the proportion (designated "r") of genes not common to the species that the donor and recipient(s) share. Identical twins have an r of 1.0, an individual's siblings, parents, and offspring have an r of 0.5, aunts,

uncles, nephews, and nieces have an r of .025, first cousins, grandparents, and grandchildren have an r of 0.125, etc.

Altruist advocates define altruism as "a motivational state with the ultimate goal of increasing another's welfare," (Batson, 1991 p. 6). Hamilton's (1964a) inclusive fitness theory undermines this definition, because genetic self-interest includes someone who shares a high percentage of genetic information. Despite Herbert Spencer's catch phrase "survival of the fittest," the ultimate criterion that determines if a genetic tendency for altruism spreads is whether it benefits the genes themselves, not whether it benefits the bearer of the genes (Hamilton, 1964a). Altruist advocates admit that evolutionary theorists have been useful in revealing how self-sacrificial behavior can be consistent with the theory of natural selection; however, they are more concerned with the driving mental motivation of the helper (Batson, 1991). Felt oneness or empathy could arise as a consequence of attachment-related cues that signaled relatively high genetic commonality in the environment of our evolutionary adaptation. An action benefiting genes could be altruistic in terms of the cost to the helping individual.

The existence of kin selecting behaviors, selectively favoring relatives with assistance, is well established in other members of the animal kingdom, but the mental aspects of kin selection are relatively unknown. Some claim that no clear evidence exists for processes enhancing inclusive fitness in humans (e.g., Batson, 1997). However, Cialdini et al. (1997) found that as relationship closeness increased (from a near-stranger, to an acquaintance, a good friend, and a family member) so did empathic concern for a needy other. The amount of costly helping was inversely proportional to the distance of relationship. In Batson's altruism studies, for example Matthews, Batson, Horn and

Rosenman (1981), 71% of the variance in experienced empathy was accounted for by genetic relationship (as cited in Rushton, 1991).

Specific predictions based on kin selection have received empirical support. In a behavioral study, Essock-Vitale and McGuire (1985) found that (a) helping among friends was more likely to be reciprocated than helping among kin, (b) closer kin were more likely sources of help than were more distant kin, (c) helping was an increasing function of the recipient's expected reproductive potential, (d) the larger the amount of help given, the more likely it was to come from kin, (e) childless individuals gave more help to their nieces and nephews, and (f) childless aunts received more help from nieces and nephews.

A few studies on helping intentions have taken evolutionary considerations into account. Burnstein, Crandall and Kitayama (1997) provided a number of examples where respondents selectively chose to assist recipients in a fitness-enhancing manner. The drop in perceived relatedness between target characters of various genetic distances was significant; the largest difference was between close kin ($r = .5$) vs. moderately close kin ($r = .25$) and between distant kin ($r = .125$) vs. non-kin ($r = .00$). Intentions for everyday helping behaviors showed equal intervals of decline across targets in forced-choice assistance scenarios, yet intentions to assist for life-or-death scenarios mirrored the pattern found in perceived relatedness. Burnstein et al. (1997) also found that respondents were (a) more likely to help infants and the elderly in everyday situations but were more likely to save young targets (1, 10 and 18 years) than older targets (45 and 75 years) in life-or-death situations, (b) under famine conditions, more likely to save 10 and 18 year olds than those in the other age categories, (c) more likely to help kin with poor health in

everyday situations, but kin with good health in life-or-death situations, and (d) more likely to help poor kin in everyday situations but wealthy kin in life-or-death situations. An evolved helping tendency may be most important in emergencies, rather than in the sort of helping behaviors under examination in typical laboratory studies, which are not likely to impact on the recipient's survival or procreation (Kenrick, 1991).

The present study seeks to explore the psychological qualities of kin selecting processes. The intention to perform a helping (or other) behavior could be based on the judgment that it is rational, ethical, and/or because one feels obligated to perform the action. Four domains of assistance were examined; life-saving scenarios typical of kin selection paradigms, donations of material wealth, assistance enhancing social status, and providing pleasant experiences. It was predicted that kin selection would be evident on life, tangible, and social status items via ratings of rationality, ethics, and obligation. Ratings of actions benefiting siblings were expected to be higher than actions benefiting moderately distant relatives, which were expected to be higher than for actions benefiting friends. This tendency was predicted to be weaker for the comparison condition of pleasant experience scenarios because this form of assistance is unlikely to affect survival or reproductive success.

Method

Participants

Eighty female and 40 male undergraduate students (N=120) from introductory psychology courses at an ethnically diverse, urban Midwestern American university participated. Although the wider cultural context is generally individualistic, 64.5% of the sample reported their descent as non-Western European.

Materials

The instrument contained 16 critical items and 49 filler items. Filler items, used to reduce hypothesis guessing, described situations commonly encountered by college students and issues in current debate, such the medical ethics of assisted suicide and the decriminalization of cannabis. In critical items, the respondent was described as performing a beneficial action towards an individual. The respondent was asked to rate the action on three 9-point bipolar scales which read: "How rational is this decision?," "How ethical is this decision?," and "To what degree would you feel obligated to choose this action?"

Critical items targeted four domains. Life items contained scenarios where the character in the scenario made a risky attempt to rescue the target from life threatening circumstances (a fire, a hurricane, poisoning, and drowning). Tangible resource items contained scenarios where something of substantial value was given away to the target (property, a vehicle, a valuable fossil, and a $500 gift certificate). Intangible resource items involved recognition for achievement, which could lead to an increase in social status (involvement in an important research project, presentation at a conference, mention in a book, receiving the annual PTA award). Pleasant experiences consisted of scenarios enabling targets to experience enjoyable situations (tickets to a party, tickets to a concert, dinner at a fancy restaurant, and sitting next to "the life of the party" at a wedding reception).

Target gender was held constant on each form and some of the filler items contained characters with the complementary gender. Target characters were given a name (e.g., "your brother Mike"), which remained constant. Name attractiveness was

controlled for with the aid of ratings from respondents ($\underline{N}$=52) in the same population.

Two items were modified to reduce ceiling effects found with a pilot sample ($\underline{N}$=35).

Eight forms of the questionnaire matched eight targets with each of the items: sisters,

brothers, nieces, nephews, male and female cousins, male and female friends.

Procedure

Participants received verbal instructions on the general purpose and nature of the

experiment. After informed consent was obtained, participants completed one form of the

inventory. Orthogonal linear contrasts based on predictions from evolutionary theory

compared siblings to all other targets, friends and the moderately distant relatives, and

niblings (nephews and nieces) to cousins on life, tangible and intangible resource

scenarios. Only one contrast between friends and all relatives was performed for the

situation scenarios, because these responses were not expected to exhibit kin selection.

Contrast results were evaluated using the HC-Holm procedure (Toothaker, 1993), to hold

ERFW at .05.

<div align="center">Results</div>

Rational Scale

A 4 (type of scenario) x 4 (relationship distance) x 2 (gender of target) x 2

(gender of respondent) ANOVA was used to analyze the data from each scale. The

ANOVA for scores on the rational scale found main effects for relation, $\underline{F}(3,348) = 8.24$,

$\underline{p} < .001$, scenario, $\underline{F}(3,114) = 9.78$, $\underline{p} < .001$, and a significant interaction between

relation and scenario, $\underline{F}(9,1044) = 9.06$, $\underline{p} < .001$. Contrasts indicated that rescue attempts

were considered more rational for siblings than for the others, $\underline{F}(1, 348) = 15.2$, $\underline{p} < .01$

(See Table 1). Providing tangible resources for a nibling or a cousin was considered more

rational than for a friend, $\underline{F}(1, 348) = 5.24$, $\underline{p} < .01$. Providing tangible resources for a

nibling was considered more rational than for a cousin, $\underline{F}(1, 348) = 4.46$, $\underline{p} < .01$.

Providing intangible resources for a sibling was seen as more rational than for the others,

$\underline{F}(1, 348) = 3.63$, $\underline{p} < .01$. Contrary to predictions, providing intangible resources to a

cousin was seen as more rational than to a nibling, $\underline{F}(1, 348) = 4.61$, $\underline{p} < .01$. No

difference was found between the rationality of providing pleasant situations for friends

and relatives.

Ethical Scale

The effects of relation, $\underline{F}(3,114) = 42.42$, $\underline{p} < .001$, scenario, $\underline{F}(3,114) = 42.67$, $\underline{p} <$

.001, and the scenario by relation interaction, $\underline{F}(9,108) = 29.65$, $\underline{p} < .001$, were

statistically significant. Contrasts indicated that making a life saving attempt for a sibling

was considered more ethical than for the others, $\underline{F}(1, 348) = 3.64$, $\underline{p} < .01$. Donating

tangible resources to niblings and cousins was seen as more ethical than donating to

friends, $\underline{F}(1, 348) = 2.25$, $\underline{p} < .025$. Providing intangible resources to a cousin was seen as

more ethical than for a nibling, $\underline{F}(1, 348) = 3.97$, $\underline{p} < .01$, which was opposite of the

prediction. No difference in ethical judgment was found between providing pleasant

situations for friends and relatives.

Obligation Scale

The effects of scenario, $\underline{F}(3,114) = 50.4$, $\underline{p} < .001$, relation, $\underline{F}(3,114) = 7.85$, $\underline{p} <$

.001, and the scenario by relation interaction, $\underline{F}(9,108) = 8.89$, $\underline{p} < .001$, were significant.

The difference in obligation to siblings and all others, was significant for life, $\underline{F}(1, 348) =$

5.70, $\underline{p} < .01$, tangible resource, $\underline{F}(1, 348) = 16.4$, $\underline{p} < .01$, and intangible resource

scenarios, $\underline{F}(1, 348) = 2.50$, $\underline{p} < .01$. Obligation to provide tangible resources for a nibling

was higher than for a cousin, $\underline{F}(1, 348) = 6.10$, $\underline{p} < .01$. Obligation to provide intangible resources for friends was higher than for niblings and cousins, contrary to prediction, $\underline{F}(1, 348) = 4.70$, $\underline{p} < .01$. As predicted, there was no difference in obligation to provide pleasant situations between friends and relatives.

Discussion

The results from this study advance the literature by illuminating the psychological qualities of kin selecting processes enhancing inclusive fitness. Ten orthogonal linear contrasts indicated that participants significantly favored the closer relation when considering fitness enhancing assistance. Ratings of the rationality of providing assistance and feelings of obligation to provide assistance showed the strongest effects of kin selection. Although the self-report format of this experiment is a limitation, feelings of obligation to perform a specific action do predict actual helping (Schroeder et al., 1995). Judgments of the ethical nature of assistance were less influenced by relationship distance. The flat scores and non-significant contrasts for pleasant situation scenarios provide divergent validity. Kin selection for this form of assistance would not be adaptive because it would not impact survival or reproductive fitness.

The strongest support for kin selection was seen in the most critical test of the hypothesis, the linear contrasts between siblings and all others, as siblings share the highest proportion of genetic information. The other comparisons provided weaker support for kin selection. Cultural changes in family structure and dispersion may have rendered kinship identification cues such as physical proximity less reliable than they were in the ancestral past. Burnstein et al. (1997) found that the perceived relationship

distance between siblings and moderately distant relatives was greater than the actual
genetic distance.

The establishment of social norms for altruistic actions may be another factor
explaining weak kin selection for moderately distant relatives. Solitary altruistic actions
will occur because the donors may some day find themselves in need and could expect to
benefit from help. As long as this help occurs, altruistic actions benefiting non-relatives
will be performed. The higher degree of social isolation prior to modern times increased
the chances that other altruists would benefit from altruistic behaviors, leading to the
propagation of traits that encourage helping (Schroeder et al., 1995). The term
"reciprocal altruism" is used to describe this system of assistance (Trivers, 1972).

Intangible resource items may have recorded the respondents' disdain for
"nepotism," in the vernacular sense. Because the filler items intentionally addressed
controversial issues, respondents may have been more likely to see the intangible items in
a negative light. A different set of inherent cognitive guidelines may be violated if
recognition for achievement is given inappropriately. Accuracy in the endowment of
social status would be adaptive because those recognized for achievements may be
sought out for advice or become leaders in the group. A group with a poor leader may not
be as successful.

Contrasts between niblings and cousins were in the predicted direction for
tangible resources, but not for intangible resources. This indicates that niblings may have
been perceived as younger children, benefiting more from financial gains than from
recognition for achievement. The schema for a young nibling may be responded to
differently than one for a nibling the respondent's age. Although the target descriptions

read "your adult nephew Mark," (etc.), any nephews and nieces related to traditional college students are likely to be very young.

Participants' low levels of obligation to part with valuable objects sharply contrasted with the highly ethical judgments of these actions. This hesitancy to "share the wealth" should be noted by those researching altruism. Altruism studies often emphasize a state of need, and individuals may be more likely to help if they believe the action may make the difference between survival and death (Burnstein et al., 1997). When needs for survival are met, individuals may be less likely to assist the "needs" of reproductive fitness.

This study provides additional evidence for intentions to perform altruistic behaviors that are consistent with inclusive fitness theory. Individuals will be more likely to provide valuable assistance when the target is a close family member. These actions may be costly to the donor and therefore considered altruistic from the perspective of individuals, however they benefit the genes promoting the actions. The additional domain found to exhibit kin selection, material wealth, may provide a new direction for future research on helping behaviors.

References

Batson, C. (1991). The altruism question: Towards a social-psychological answer. Hillsdale, NJ: Erlbaum.

Batson, C. (1997). Self-other merging and the empathy-altruism hypothesis: Reply to Neuberg et al. (1997). Journal of Personality and Social Psychology, 73, 517-522.

Batson, C., Sager, K., Garst, E., Kang, M., Rubchinsky, K. & Dawson, K. (1997). Is empathy-induced helping due to self-other merging? Journal of Personality and Social Psychology, 73, 495-509.

Burnstein, E., Crandall, C., & Kitayama, S. (1997). Some neo-Darwinian decision rules for altruism: Weighing cues for inclusive fitness as a function of the biological importance of the decision. Journal of Personality and Social Psychology, 67, 773-789.

Cialdini, R., Brown, S., Lewis, B., Luce, C., & Neuberg, S. (1997). Reinterpreting the empathy-altruism relationship: When one into one equals oneness. Journal of Personality and Social Psychology, 73, 481-494.

Essock-Vitale, S., McGuire, M. (1985). Women's Lives viewed from an evolutionary perspective. II. Patterns of helping. Ethology and Sociobiology, 6, 155-173.

Hamilton, W. (1964a). The evolution of altruistic behavior. The American Naturalist, 97, 354-6.

Hamilton, W. (1964b). The genetical evolution of social behavior, I. Journal of Theoretical Biology, 7, 1-16.

Kenrick, D. (1991). Proximate altruism and ultimate selfishness. Psychological Inquiry, 2, 135-137.

Matthews, K., Batson, C., Horn, J., & Rosenman, R. (1981). The heritability of empathic concern for others. <u>Journal of Personality, 49,</u> 237-247.

Rushton, J. (1991). Is altruism innate? <u>Psychological Inquiry, 2,</u> 141-143.

Schroeder, D., Penner, L., Dovidio, J. & Piliavin, J. (1995). <u>The psychology of helping and altruism.</u> New York: McGraw Hill.

Toothaker, L. E. (1993). <u>Multiple comparison procedures</u>. Newbury Park, CA: Sage.

Trivers, R. (1972). The evolution of reciprocal altruism. <u>Quarterly Review of Biology, 46,</u> 35-37.

Table 1.

Mean scores on Rating Scales

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Scenario	Sibling	Nibling	Cousin	Friend

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Rational Scale

Life	1.68 [a]	1.25 [b]	1.18 [b]	0.98 [b]
Tangible	1.20 [b]	1.42 [a]	0.85 [b]	0.60 [c]
Intangible	1.95 [a]	1.15 [c]	1.73 [b]	1.71 [c]
Experience	1.69	1.57	1.48	1.84

Ethical Scale

Life	2.48 [a]	2.28 [b]	2.02 [b]	2.39 [b]
Tangible	2.04 [a]	2.11 [b]	1.83 [b]	1.65 [c]
Intangible	0.49 [a]	0.17 [b]	0.66 [a]	0.67 [a]
Experience	1.74	1.99	1.68	1.73

Obligation Scale

Life	2.84 [a]	2.40 [b]	2.19 [b]	2.39 [b]
Tangible	1.10 [a]	0.63 [b]	-0.02 [c]	0.08 [c]
Intangible	1.08 [a]	0.38 [c]	0.77 [c]	1.07 [b]
Experience	1.08	0.94	0.73	0.98

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Note. Means with different superscripts are significantly different, ERFW <.05.