

Evolution and altruism

Combining psychological mediators with naturally selected tendencies

Daniel J. Kruger

Institute for Social Research, University of Michigan, P.O. Box 1248, Ann Arbor, MI 48106-1248, USA

Received 28 August 2002; received in revised form 13 November 2002

Abstract

This study integrates psychological predictors of helping intentions and naturally selected tendencies enhancing inclusive fitness for a more comprehensive understanding of altruism. Psychological mediators of helping intentions, empathic concern and oneness, and psychological processes facilitating kin selection and reciprocal altruism were combined in a structural equation model to predict participants' ($N=643$) intentions to perform a risky rescue behavior. The tendency for reciprocal altruism and kinship were the strongest predictors of rescue intentions. Confirming previous research, empathic concern made a significant but small contribution in predicting helping intentions. Proximate mechanisms currently in the psychological literature did not entirely account for the effect of kinship on helping intentions. © 2003 Elsevier Science Inc. All rights reserved.

Keywords: Reciprocal altruism; Kin selection; Oneness; Empathy

1. Introduction

1.1. Psychological altruism and egoism

Research on altruism attempts to illuminate fundamental characteristics of human nature. Batson et al.'s (1997) empathy–altruism hypothesis proposes that empathic concern evokes an altruistic motivation. Studies supporting this hypothesis have systematically varied

E-mail address: kruger@umich.edu (D.J. Kruger).

whether individuals can only obtain egoistic goals by helping, or whether they can escape from the situation and obtain the egoistic goals without helping (Batson & Shaw, 1991). These studies purportedly demonstrate that at least some people have helping intentions that are not explained by egoistic motivations, such as the relief of personal distress (Batson & Shaw, 1991), escaping public shame for not helping (Batson & Shaw, 1991), the relief of sadness (Batson et al., 1989), and the desire to make oneself happy (Batson et al., 1991).

Cialdini, Brown, Lewis, Luce, and Neuberg (1997) have proposed that it is the sense of self–other overlap, or “oneness” between the helper and the individual in need, that motivates helping, rather than empathy. Helping others with whom one feels commonality would not be selfless, because it leads to a more favorable mental state. Studies examining whether the effect of empathic concern can be eliminated when the sense of oneness with the target, or “self–other overlap,” is accounted for have produced contradictory results (Batson et al., 1997; Cialdini et al., 1997).

1.2. Integrating proximate and ultimate influences

Although some claim that no clear evidence exists for the operation of inclusive fitness enhancing processes in humans (e.g., Batson, 1997), specific predictions based upon kin selection have empirical support (e.g., Essock-Vitale & McGuire, 1985). In a series of experiments, Burnstein, Crandall, and Kitayama (1997) demonstrated how the consequences to evolutionary fitness influenced target selection in life or death rescue scenarios and everyday helping behaviors. Shavit, Fischer, and Koresh (1994) have provided data revealing nepotistic actions in real-life emergency situations.

Altruism advocates define altruism as “a motivational state with the ultimate goal of increasing another’s welfare” (Batson, 1991 p. 6). The distinction between self and other is confounded when one considers benefits at the genetic level. Altruism 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).

Consistent with evolutionary theory, the experience of oneness or empathy could arise as a consequence of attachment-related cues (kinship, friendship, familiarity) that signaled the potential for relatively high genetic commonality in the EEA (Kenrick, 1991). The psychological states provoked by these cues could increase the chances of the needy individuals receiving assistance, enhancing the survival and replication of genes influencing the psychological capacities for oneness and empathy. This would account for the altruism advocates’ example of a mother rushing to help her injured child (Kenrick, 1991). Genes promoting their own self-propagation may operate through actions that could be considered psychologically altruistic.

Empirical hypotheses for helping intentions can be generated from the integration of psychological and evolutionary theory.

Hypothesis 1: Kinship should have a significant positive impact on the mental states (oneness and empathic concern) that serve as proximate mediators of helping intentions.

Hypothesis 2: Kinship should also make a significant unique contribution to the variance explained in helping intentions. People do not need to be aware of the inclusive fitness consequences of their actions for tendencies to be naturally selected. Nonconscious processes may also be quicker than conscious processes, an advantage in critical situations where survival is determined in a matter of seconds.

Hypothesis 3: Following from reciprocal altruism theory, it is predicted that an individual's helping intentions will reflect the expected likelihood for the target to help if positions in the situation were reversed.

Hypothesis 4: Participants should have a higher expected likelihood for kin helping them than for nonkin helping them, an intuitive expression of inclusive fitness theory.

2. Method

2.1. Participants

Students ($N=643$, female=456) from an ethnically diverse (52% reported non-Western European descent), urban Mid-Western American university participated. The mean age was 20.27 years (S.D. = 4.19).

2.2. Materials

Three items measured oneness: a modified version of Aron, Aron, and Smollan's (1992) pictographic Inclusion of Other in Self (IOS) scale; a second task where participants traced an outline of a washer representing themselves in relation to a circle representing the target character; and an item where participants indicated the extent to which they would use the term "we" to describe their relationship with a target character. Cialdini et al. (1997) successfully combined the "we" item with the IOS scale to create a oneness index. A four-item index similar to Batson, Turk, Shaw, and Klein's (1995) version assessed empathic concern. An item for "moved" replaced the item for "sympathetic," because it more clearly assesses the construct of interest (Fultz, Schaller, & Cialdini, 1988).

In the evolutionary literature, perceptions of reciprocity are based on a review of interaction history that results in a judgment of the likelihood that the target would perform the helping behavior in the present situation (e.g., Reeve, 1998). Three items targeted this construct. Three items assessed sadness and aversive arousal, although they were not included in the main analysis. The Marlow–Crowne, Form C Social Desirability measure (Silverstein, 1983) was included to assess and control for the effect of socially desirable responding.

2.3. Procedure

Participants were randomly assigned to think of a sibling close in age or a close friend known for several years, and to give the first name, gender, and age of the person. Participants

completed preliminary items, such as liking of and similarity to the target. Participants then read a 500-word scenario (with a Flesch–Kincaid grade level of 6.4) in which they were with the target character. Participants filled in the name of the target character when s/he was mentioned. At the end of the scenario, there was an ambiguous situation where the target might be in a life-threatening fire. Participants completed the items described above. After completing filler items, participants repeated the task with an identical scenario for the alternate target.

Analyses utilized LISREL 8.3 (Joreskog & Sorbom, 1996) to create a hybrid path model with kinship as a dichotomous exogenous variable and empathic concern, oneness, expectancy, and helping intention as endogenous latent variables with data from the first scenario. The model permitted covariance between the latent variables for oneness, empathic concern, and expectancy for the target to help. Data from the second scenario replicated the first analysis. ANOVAs for mixed designs were performed to provide a within-subject confirmation of the results.

3. Results

3.1. Justification for interpretation of analytical results

The Cronbach alphas for the construct scales were .93 for helping intention, .93 for empathic concern, .92 for expectancy, and .85 for oneness. No items were systematically affected by socially desirable responding. The hypothesized model had a good fit to the data, as indicated by various fit indicators: Goodness-of-Fit Index (GFI)=0.93, Non-Normed Fit Index (NNFI)=0.95, Root Mean Square Error of Approximation (RMSEA)=0.075, and Comparative Fit Index (CFI)=0.96. No other arrangement of the constructs had a better fit to the data. The expectancy for help from the target covaried 61% with oneness and empathic concern, oneness and empathic concern covaried 46%.

3.2. Tests of hypotheses

3.2.1. Hypothesis 1

The prediction that oneness and empathic concern would be higher for sibling targets than for friend targets was not supported. In fact, oneness was significantly lower for siblings than for friends, $z=5.20$, $P<.001$ (see Fig. 1). No difference was found for empathic concern. A post hoc analysis indicated that participants liked, $r(444)=-0.36$, $P<.01$ (two-tailed), and felt more similar, $r(444)=-0.21$, $P<.01$ (two-tailed), to their friends than their siblings.

3.2.2. Hypothesis 2

Kinship made a significant unique contribution to the variance explained in the helping intentions, $z=4.63$, $P<.001$. The strength of the unique effect of kinship, $d=0.26$, was greater than the effect of empathic concern on helping intention, $d=0.24$, $\chi^2(643, df=1)=6.59$, $P<.01$.

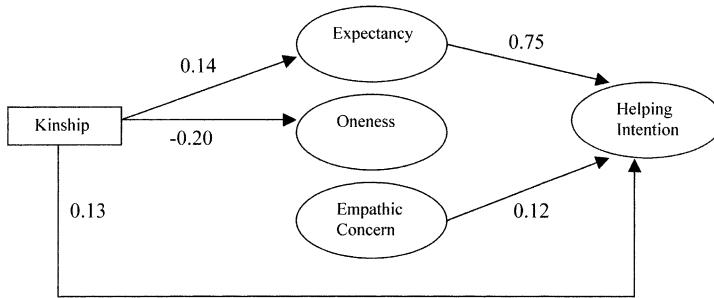


Fig. 1. Standardized coefficients in hybrid model. $\chi^2 (N=643, df=66)=148.25, P<.001$. All standardized structural coefficients were statistically significant at $P<.00001$, two-tailed. Expectancy covaried 61% with oneness and empathic concern, oneness and empathic concern covaried 46%.

3.2.3. Hypothesis 3

The expectancy for the target to help made a unique prediction of helping intentions, $z=21.16, P<.001$. This effect, reflecting the tendency for reciprocal altruism, was more than eight times as strong, $d=2.26$, as the effect of empathic concern.

3.2.4. Hypothesis 4

Participants' expected likelihood for kin helping was higher than for nonkin helping, $z=3.76, P<.001$. A post hoc analysis indicated that kinship had no effect on sadness or aversive arousal, and that neither sadness nor aversive arousal had a unique effect on helping intentions.

3.3. Replication

Data from the second scenario ($N=358$) replicated the initial results, with the exception of the effect of kinship on the expectancy for target helping. The model had a good fit to the data, $GFI=0.90, NNFI=0.94, RMSEA=0.082, \text{ and } CFI=0.96$. Two-way ANOVAs confirmed the within-subject effect of kinship on oneness, $F(1,353)=28.04, P<.001$, expectancy for target helping, $F(1,390)=5.46, P=.02$, and helping intention, $F(1,390)=61.02, P<.001$.

4. Discussion

Integrating concepts from evolutionary theory enhances the psychological framework for understanding altruistic helping intentions. The effect of expectancy, representing the tendency for reciprocal altruism, was eight times as strong as the effect of the most powerful traditional predictor, empathic concern. Kinship had a significant unique effect that was not accounted for by the previously established psychological predictors of helping. The effect of kinship had a complex relationship to helping intentions, with a negative effect as mediated by the construct of oneness and a positive effect as mediated by the construct of expectancy.

Kinship did not increase mean levels of the psychological predictors of helping, empathy, and oneness, disconfirming the first hypothesis. The negative correlation between kinship and oneness may be due to differences in qualities of the relationships among siblings and friends. Prior research revealed that undergraduates spent more time with and felt closer to their friends than to their siblings, and felt more differentiation with their siblings than with their friends (Pulakos, 1989). A post hoc analysis of the current data indicated that participants liked and felt more similar to their friends than to their siblings. Strong affective ties to nonkin may also be much more common in the present than the EEA. This may also reflect sibling competition for the attention and resources of their parents (Trivers, 1974). It is striking that kinship did not affect empathy. Cialdini et al. (1997) also did not find significant differences between the level of empathy experienced for good friends and close family members in any of five scenarios. However, Rushton (1991) found a significant relationship between kinship and empathy.

The unique effect of kinship on helping intentions replicates findings in previous research (Korchmaros & Kenney, 2001). There are at least three interpretations for this effect. Some of the mental processes facilitating nepotism may be automatically activated; just as automatically activated stereotypes can have an evaluative component (Tesser & Martin, 1996). An automatically activated influence would be an efficient adaptation, considering that some rescuing actions (e.g., battles with predators, hazardous prey, or other humans) would have to be very quick to be successful. Another possibility is that psychological processes promoting nepotism exist, but were not measured in this experiment or other studies in the literature. Finally, people could have a specific psychological construct for kin in need of assistance, which would lead directly to helping intentions.

The tendency for reciprocal altruism accounted for the greatest portion of the variance in the likelihood of helping, more than all other effects combined. This finding emphasizes that reciprocity is an important factor in human social interaction. Participants had an intuitive understanding of inclusive fitness theory. Expectations were higher for help from kin than help from friends. Attributing this effect and the effect of kinship on helping intentions to cultural norms does not exclude the possibility that those cultural norms have a foundation in evolutionary adaptations.

Empathic concern had a unique effect of helping intentions, although its impact was small in comparison with reciprocity. This is evidence that proximally altruistic mechanisms may operate within a genetically “selfish” system. Because our ancestors lived in small kin-based groups, mechanisms that may have formerly promoted genetic dispersal may now be generalized to nonkin. Expectancy for help from the target shared an equal and substantial amount of variance with empathic concern and oneness, more than oneness and empathic concern shared with each other. Once the effect of expectancy for target helping was accounted for, the effect of oneness was no longer significant.

How the altruism question is addressed by research may shape the descriptions of, and expectations for, helping behaviors in humans. From an evolutionary perspective, the subjective experiences underlying an adaptation can vary, as long as they reliably lead to the adaptive behaviors. This allows for the possibility of psychologically altruistic mecha-

nisms operating in a genetically egoistic manner. Results indicated that psychologically altruistic and egoistic pathways operate simultaneously. By aligning social science with the most powerful explanatory theory in the life sciences, evolutionary psychology helps facilitate the eventual consilience of knowledge (Wilson, 1998).

Acknowledgments

The author would like to thank Fred B. Bryant, Lois Leidahl-Marsh, Robert Russell, and R. Scott Tindale for their assistance with this project and reviewers for their helpful comments.

References

- Aron, A., Aron, E., & Smollan, D. (1992). Inclusion of other in the self scale and the structure of interpersonal closeness. *Journal of Personality and Social Psychology*, *63*, 596–612.
- Batson, C. (1991). *The altruism question: towards a social-psychological answer*. Hillsdale, NJ: Erlbaum.
- Batson, C. D. (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. D., Batson, J., Griffitt, C., Barrientos, S., Brandt, J., Sprengelmeyer, P., & Bayly, M. (1989). Negative-state relief and the empathy–altruism hypothesis. *Journal of Personality and Social Psychology*, *56*, 922–933.
- Batson, C. D., Batson, J., Singlsby, J., Harrell, K., Peekna, H., & Todd, R. (1991). Empathic joy and the empathy–altruism hypothesis. *Journal of Personality and Social Psychology*, *61*, 413–426.
- Batson, C. D., 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.
- Batson, C. D., & Shaw, L. (1991). Evidence for altruism: toward a pluralism of prosocial motives. *Psychological Inquiry*, *2*, 107–122.
- Batson, C. D., Turk, C., Shaw, L., & Klein, T. (1995). Information function of empathic emotion: learning that we value the other's welfare. *Journal of Personality and Social Psychology*, *68*, 300–313.
- 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.
- Fultz, J., Schaller, M., & Cialdini, R. (1988). Empathy, sadness, and distress: three related but distinct vicarious affective responses to another's suffering. *Personality and Social Psychology Bulletin*, *14*, 312–325.
- Joreskog, K. G., & Sorbom, D. G. (1996). *LISREL 8: user's reference guide*. Chicago: Scientific Software International.
- Kenrick, D. (1991). Proximate altruism and ultimate selfishness. *Psychological Inquiry*, *2*, 135–137.
- Korchmaros, J. D., & Kenney, D. A. (2001). Emotional closeness as a mediator of the effect of genetic relatedness on altruism. *Psychological Science*, *12*, 262–265.
- Pulakos, J. (1989). Young adult relationships: siblings and friends. *Journal of Psychology*, *123*, 237–244.
- Reeve, H. (1998). Acting for the good of others: kinship and reciprocity with some new twists. In: C. Crawford, & D. Krebs (Eds.), *Handbook of evolutionary psychology: issues, ideas, and applications* (pp. 43–83). Mahwah, NJ: Lawrence Erlbaum Associates.

- Rushton, J. (1991). Is altruism innate? *Psychological Inquiry*, 2, 141–143.
- Shavit, Y., Fischer, C. S., & Koresh, Y. (1994). Kin and nonkin under collective threat: Israeli networks during the gulf war. *Social Forces*, 72, 1197–1215.
- Silverstein, A. B. (1983). Validity of random short forms: II. The Marlowe–Crowne Social Desirability Scale. *Journal of Clinical Psychology*, 39, 582–584.
- Tesser, A., & Martin, L. (1996). The psychology of evaluation. In: E. T. Higgins, & A. W. Kruglanski (Eds.), *Social psychology: handbook of basic principles* (pp. 400–432). New York: Guilford Press.
- Trivers, R. L. (1974). Parent–offspring conflict. *American Zoologist*, 14, 249–264.
- Wilson, E. O. (1998). *Consilience: the unity of knowledge*. New York: Alfred A. Knopf.