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# Altruism Relates to Health in an Ethnically Diverse Sample of Older Adults

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**The existing literature indicates links between aspects of social network functioning and health outcomes. It is generally believed that networks that are larger or provide greater instrumental and emotional support contribute to improved health and, perhaps, greater longevity. Recently, it has been suggested that *giving* as well as *receiving* social support may be of benefit. On the basis of evolutionary theories of emotion and altruism, the current study sought to test this thesis in a large, ethnically diverse sample of community-dwelling older adults. As expected, levels of social support *given* were associated with lower morbidity, whereas levels of receiving were not. It is important that these relations held even when (a) socioeconomic status, education, marital status, age, gender, ethnicity, and (b) absolute network size and activity limitation were controlled for. Results are discussed in terms of their implications for theory regarding the relations among social exchanges, giving, and later life adaptation among older adults.**

AGING is a multifactorial process presenting an array of novel challenges (Smith & Baltes, 1999; Magai, Consedine, King, & Gillespie, 2003). Increasing morbidity (Lima & Allen, 2001), declines in energy resources (Leventhal, Patrick-Miller, Leventhal, & Burns, 1997; Panksepp & Miller, 1996), interference with the activities of daily living (Steverink, Westerhof, Bode, & Dittmann-Kohli, 2001), and social network attrition (Lang, Staudinger, & Carstensen, 1998; van Tilburg, 1998) have necessitated a concerted research effort aimed at understanding the connections between psychosocial variables and healthy aging.

## *Social Support and Health*

One major factor that has garnered a good deal of attention in the study of health and aging is the quality of social relations (Blazer, 1992; House, Landis, & Umberson, 1988; Smith, Fernengel, Holcroft, Gerald, & Marien, 1994). Social support has been associated with better health and longevity (Feinstein & Brewer, 1999; Kawachi et al., 1996). For example, in a meta-analysis of experimental studies, social support received (e.g., advice from a confederate) led to physiological benefits under stressful conditions (Thorsteinsson & James, 1999). Correspondingly, isolation has been associated with poorer health (Berkman & Syme, 1979; Feinstein & Brewer). House, Robbins, and Metzner (1982), for example, found that network size was predictive of mortality in a prospective study.

*Contradictory findings.*—Although the idea "the more friends you have available the better" makes intuitive sense, there are several factors indicating that having larger social networks (Seeman, 2000) or receiving social support (Lu & Argyle, 1992) may not always be associated with beneficial outcomes. A meta-analysis revealed that social support had only a small influence on health outcomes (Smith et al., 1994). As social networks comprise nonvoluntary ties (e.g., with a family member who is unsupportive), the relationships may reflect a form of *negative social support* (De Leeuw et al., 2000). It has also been suggested that dependence can create conflict and guilt (Baltes, 1996; R. M. Brown, Dahlen, Mills, Rick, & Biblarz, 1999; de Catanzaro, 1986). Indeed, the relation between social support and positive outcomes is unlikely to be simple (Biegel, Magaziner, & Baum, 1991; Seeman; Creel & Sands, 2003). Consequently, although the number of social exchange partners is typically associated with positive outcomes, the type(s) of social exchange may influence this relation.

*Kin and nonkin giving: An evolutionary approach.*—One consideration that may assist in clarifying social network–health relations involves separating social support *given* from social support *received*. It has been conjectured that giving or altruism may be an evolved biological indicator of healthy aging, whereas receiving support may indicate needs associated with disability or illness (e.g., S. L. Brown, Nesse, Vinokur, & Smith, 2003). Evolutionary theory indicates that individuals who give more social support than they receive, that is, are altruistic, could accrue a variety of fitness benefits over the life span. (See Frank, 1988; Jensen-Campbell, Graziano, & West, 1995; Hamilton, 1964; and Trivers, 1971. In this article we define altruism to be any helping that has costs, i.e., time, effort, or goods, that may have *temporarily* reduced fitness in ancestral environments. However, we point out that, according to evolutionary theory, ancestral altruists must have received some compensatory benefit that translates into inclusive fitness benefits, e.g., for close kin or the genes predisposing altruism in the population; otherwise altruism would not exist in the current population.)

It has been hypothesized that positive emotions that facilitate social giving such as happiness (Frank, 1988; W. M. Brown & Moore, 2002; W. M. Brown, Palameta, & Moore, 2003) could lead to health benefits (S. L. Brown et al., 2003; Nesse, 2001). However, there is an evolutionary distinction between individuals who give without expectation of return payment (motivated altruism at the proximate level—see Frank, 1988; W.M. Brown & Moore, 2002) and individuals who expect reciprocal benefits

(Trivers, 1971). Social partnerships based on psychological altruism may elicit positive affect in the giver. However, altruism based on conscious concerns regarding reciprocity could be a source of stress in donors that are expecting return payment. The theory of reciprocal altruism (Trivers) does not require that donors and recipients feel positive about the relationship, although Frank's commitment model requires the presence of prosocial emotions in order for human altruism to evolve. An important distinction has to be made between fitness benefits in which the altruist, or close kin, has better chances of survival and reproduction as a result of social giving versus the view that health benefits accrued are due to proximate motivators of social giving (e.g., prosocial commitment). In and of itself, social giving among older people may or may not have contributed to ultimate genetic success in ancestral populations. Indeed, unless long-lived humans are delivering benefits to reproductively viable close kin, e.g., the grandmother hypothesis (see Euler & Weitzel, 1996; Hawkes, O'Connell, Burton Jones, Alvarez, & Charnov, 1998; Lee, 2003), it is difficult to imagine how healthy postreproductive altruists would benefit. Our position in this article is that the proximate influences designed for social giving are somehow (perhaps by means of the emotions committing social giving—see Frank and see Nesse) influencing positive health outcomes across the life span.

Empirically, giving to others, particularly kin, is an important explanation for longevity in both primates and humans (Allman, Rosin, Kumar, & Hasenstaub, 1998; Hawkes et al., 1998; Lee, 2003) and is associated with a number of positive outcomes. In terms of mortality, S. L. Brown and colleagues (2003), in a longitudinal study, asked 423 older couples about the support they provided to kin and nonkin, whether or not they could count on help from others, and about the material and emotional support they gave each other. Individuals who gave *fewer* resources to others (kin and nonkin) were twice as likely to die, even when background factors including age, gender, and health were controlled. A total of 134 people died across the 5 years of the study; there was no association between receiving help and death risk. Such findings are consistent with data from social psychology suggesting benefits from altruistic social interest. People who help others report less stress (Cialdini, Darby, & Vincent, 1973; Midlarsky, 1991), better life adjustment (Crandall, 1984; Zarski, West, & Bubenzer, 1982), less hopelessness or depression (Crandall, 1975; Miller, Denton, & Tobacyk, 1986), greater positive coping (Schwartz et al., 2003), better physical health, and increased longevity (Zarski, Bubenzer, & West, 1986). In the current study we separated kin and nonkin network analyses, as different evolutionary explanations are required for kin versus nonkin giving (Hamilton, 1964; Trivers, 1971). We also separated giving without return payment (Frank, 1988) and reciprocity-based partners (Trivers), because different theoretical perspectives and psychological mechanisms are possibly involved (Jensen-Campbell et al., 1995; W. M. Brown & Moore, 2000).

### *Volunteerism and Healthy Aging*

Although volunteerism cannot be equated with giving in social networks, research on volunteers has likewise provided evidence that formal giving bequeaths benefits (Morrow-Howell, Hinterlong, Rozario, & Tang, 2003). There are positive relations between volunteerism and health (Caro & Bass, 1997), higher life satisfaction, a stronger will to live, and less mental disturbance (Hunter & Linn, 1980), and membership in a fraternal organization is associated with fewer health declines (Hirdes & Forbes, 1993). In a review of 37 studies from 1968 to 1994, Wheeler, Gorey, and Greenblatt (1998) found that 70% of older volunteers scored higher on quality of life measures than nonvolunteers. The few existing longitudinal studies are consistent with the hypothesis that giving is associated with superior health and reduced mortality (Luoh & Herzog, 2002; Musick, Herzog, & House, 1999; Oman, Thoresen, & McMahon, 1999; Van Willigen, 2000).

Although the research on the benefits of formal and informal giving exhibits promise, at least two aspects of the social giving–health relation remain unexplored. First, studies considering given social support have paid little attention to cultural variation. Second, because studies have not typically controlled for either total network size or the capacity to give, it remains unclear whether the benefits associated with giving occur because only those individuals functionally more capable of giving will give, or whether health benefits are a consequence of giving per se. We designed the current study to address these limitations in an investigation of informal social networks, each of which is described in the paragraphs that follow.

### *Cultural Differences*

Most studies on giving and positive outcome have ignored culture. For example, in three of the most recent studies, the proportion of White participants has been 95% (Musick et al., 1999), 95% (Schwartz, Meisenhelder, Ma, & Reed, 2003), and 89% (S. L. Brown et al., 2003). The absence of ethnically representative samples noted, there are important reasons for their consideration (see Chatters, Taylor, & Jackson, 1985; Mindel, Wright, & Starret, 1986). Studies among ethnic groups in the United States, for example, have documented important differences in filial norms (Burr & Mutchler, 1999), although cross-national studies have shown that the quality and quantity of social networks appear similar (Antonucci, Fuhrer, & Jackson, 2002).

In the current article, using a sample size enabling specific tests for interactions, we consider how altruistic social support and morbidity relate in four ethnic groups. Past findings suggest that simply categorizing people as "Black" or "White" may obscure meaningful cultural variation in socioemotional variables (Consedine, Magai, Cohen, & Gillespie, 2002). We document social support (given and received) in four ethnic groups living in the Northeastern United States: (a) U.S.-born African Americans; (b) English-speaking Caribbeans (e.g., Jamaican, Trinidadian, and Barbadian); (c) U.S.-born European Americans; and (d) Eastern European immigrants born in the former Soviet republics (i.e., Russia and the Ukraine).

### *Potential Confounds*

Beyond generalizability of the altruism–health hypothesis, the mechanism responsible for links between social giving and health remains unclear, and prior studies are potentially weakened because of two critical confounds. First, researchers in prior studies did not control for absolute network size when they considered how social giving relates to health. Therefore, rather than having a direct effect on health, social giving may be predicting health because it is associated with *the opportunity to*

*give* (i.e., the giving of individuals with larger networks may be overestimated). Altruistic individuals may be healthier because (a) they have larger networks and (b) larger networks are associated with better health. Coupling this conceptual issue with the fact that social network attrition occurs across the life span (Lang et al., 1998; van Tilburg, 1998) necessitates controlling for network size when examining social giving–health relations. The current study controls for absolute kin and nonkin network sizes.

Second, social giving in older populations is likely conflated with functionality, although this has been controlled in some studies. More specifically, because of a strong relation between health and functional capacity, it is possible that, instead of social giving bequeathing health benefits, it may be that those people who give are also those who are *functionally able to give* and thus report better health. In controlling for a person's capacity to give, the current study presents a more rigorous test of the altruism–health hypothesis. Therefore, any relation between social giving and health that remains after capacity to give has been controlled cannot be explained *solely* by the enhanced functional capacity.

### *Summary*

In addition to describing levels of kin and nonkin support received and given in a sample of ethnically diverse older adults, we made a number of predictions regarding the relations among giving, receiving, and health. On the basis of the aforementioned literature, we predicted that giving but not receiving support would be associated with better health. We further expected this effect would hold even when background variables and ethnicity were controlled and the effect would remain when we controlled for opportunity to give (indexed by total network size) and functional capacity (indexed by activity limitation).

We did not formulate specific, a priori predictions regarding possible relations between network reciprocity and health or whether reciprocity would predict health where levels of giving and receiving were controlled. One early study found that reciprocity was more closely related to life satisfaction than either giving or receiving (Antonucci et al., 1990), and another has shown that reciprocity within a marriage was positively related to health in females and negatively related to health in males (Acitelli & Antonucci, 1994); the current study tests for gender effects and interactions. However, reciprocity might be related to health outcomes, for example in the case in which a donor's giving is repaid by the recipient at a later date (Trivers, 1971), thus leading to an overall health benefit. Alternately, it might be that the "giving" component of a reciprocal relationship generates positive affect (Frank, 1988, S. L. Brown et al., 2003) and thus positively affects health independently of whether it is eventually reciprocated. By separating reciprocity from giving, in the current study we examine these possibilities.

## Methods

### *Participants*

We took the data from a larger population-based study on health and older Americans. Participants were 1,118 older adults living in Brooklyn, New York, recruited on the basis of a stratified cluster-sampling plan. We initially utilized census information to gather information on household income and race (see Summary Tape File 3A of the 1990 Census files). We then stratified census blocks by ethnic group on the basis of income (low, medium, and high). In order to have each socioeconomic status level represented, we used random selection without replacement to choose samples of block groups from each income level. We did this procedure *within* ethnic groups for fair representation and enhanced utility of the socioeconomic status variable. Interviewers spoke with respondents who lived within the selected blocks. All participants received $20.00 for participation. For further details on the stratified cluster-sampling technique, see Magai and colleagues (2001).

Table 1 presents the background characteristics of the sample as a whole as well as by ethnicity, and the results of analyses of variance or chi-square analyses. As indicated, the mean age of the sample was 73.84 years ($SD = 5.92$) and 61.7% were female. There were significant differences in age, income, marital status, and education across ethnicity; hence we treated these variables as covariates in the primary analyses.

### *Procedure*

Data were collected during face-to-face interviews by interviewers of the same race as the respondents. Sessions lasted approximately 1.5 hr and were conducted in the respondent's home or another location of his or her choice such as a senior center or a church. Measures were administered in a standard order. Here we describe only the measures relevant to the topic under consideration.

### *Measures*

*Demographics questionnaire.*—We collected information on age, gender, educational attainment, marital status, household income, and ethnicity.

*Social network or altruism measures.*—We assessed social network variables by using the Network Analysis Profile (NAP; Cohen & Sokolovsky, 1979; Sokolovsky & Cohen, 1981). The NAP is a semistructured interview that measures the quality of a respondent's kin (i.e., parents, children, siblings, aunts, uncles, cousins) and nonkin (i.e., friend, acquaintance, neighbor) social network. Despite the wide availability of social network instruments, we selected the NAP because of its previous use and validation in samples of older, ethnically diverse, inner-city-dwelling individuals. No network scale to our knowledge fits the unique aspects of our population while still addressing the global differences between types of social partners. A theoretical advantage to the NAP is that it distinguishes between kin and nonkin social partners in the context of giving, receiving, and reciprocal exchange relationships. Other social network instruments (e.g., Acitelli & Antonucci, 1994) that measure actual and perceived levels of giving are somewhat more precise but require that the donor and recipient's perceptions be included in the analysis. This was not possible in the current study. As we did not measure the reports of our participants' social network partners, any effects of social support given must be interpreted as perceived levels of giving rather than actual altruism.

Participants name each of the persons in the network with whom they have engaged in material (e.g., money, food, help when sick) or emotional (e.g., advice) exchanges within the past

Table 1. Demographic and Social Network Characteristics of Sample Broken Down by Ethnic Group

| Characteristic | Total Sample ($N$ = 1,118) | African American ($n$ = 236) | Caribbean ($n$ = 435) | Eastern European ($n$ = 173) | U.S-Born European American ($n$ = 274) | $\chi^2$ or $F$ value | Post Hoc |
|---|---|---|---|---|---|---|---|
| Demographic | | | | | | | |
| Mean age | 73.4 (5.92) | 74.41 (6.08) | 72.68 (5.65) | 73.09 (5.85) | 75.66 (5.79) | 16.47** | EA > C, EE; AA > C |
| Mean household income ($K) | 18.8 (18.7) | 16.1 (13.8) | 18.5 (17.6) | 15.7 (16.6) | 23.4 (23.9) | 6.03** | EA > all |
| Female (%) | 61.7 | 64.4 | 60.2 | 64.7 | 59.9 | n/s | n/a |
| Married (%) | 35.6 | 22.9 | 36.8 | 56.6 | 31.4 | 52.47** | EE > all; AA < all |
| HS degree (%) | 47.4 | 40.7 | 31.7 | 62.4 | 68.6 | 112.27** | C < all; EE, EA > AA |
| Social network | | | | | | | |
| Kin group size | 4.24 (1.93) | 4.10 (1.80) | 3.75 (1.72) | 4.76 (1.52) | 4.80 (2.31) | 23.28** | EA, EE > C, A |
| Nonkin group size | 3.53 (1.71) | 3.33 (1.61) | 3.33 (1.61) | 3.42 (1.48) | 3.81 (1.92) | 5.04** | EA > C |
| Receiving (kin) | 0.77 (1.53) | 0.70 (1.63) | 0.75 (1.39) | 0.58 (1.44) | 0.99 (1.69) | 2.98* | EA > C |
| Giving (Kin) | 1.28 (2.12) | 1.06 (1.76) | 1.51 (2.40) | 0.97 (1.84) | 1.29 (2.04) | 3.89** | C > AA, EE |
| Receiving (nonkin) | 0.35 (1.00) | 0.30 (0.92) | 0.38 (1.04) | 0.17 (0.83) | 0.47 (1.10) | 3.40* | EA, C > EE |
| Giving (nonkin) | 0.58 (1.32) | 0.37 (1.05) | 0.85 (1.62) | 0.31 (0.92) | 0.49 (1.08) | 11.26** | C > all |
| Reciprocity (kin) | 4.66 (3.64) | 5.27 (3.60) | 4.15 (3.30) | 6.31 (3.75) | 3.67 (3.71) | 23.27** | EE > AA > EA; C |
| Reciprocity (nonkin) | 4.18 (3.23) | 5.20 (3.51) | 3.87 (2.92) | 4.82 (3.37) | 3.19 (3.01) | 18.74** | AA, EE > C > EA |
| Health and activity variables | | | | | | | |
| Morbidity | 18.79 (16.82) | 19.39 (16.85) | 14.05 (15.88) | 26.87 (18.32) | 20.69 (14.82) | 21.59** | C < all |
| Activity limitations | 1.53 (1.74) | 1.58 (1.86) | 1.06 (1.64) | 2.03 (1.66) | 1.94 (1.65) | 27.92** | EE > all; C < all |

*Notes*: HS = high school; AA = African American; C = Caribbean; EE = Eastern European; EA = European American. Giving is defined as the perceived number of partners to whom a subject gave more than they received. Receiving is defined as the perceived number of partners from whom a subject received more than they gave. Reciprocity is defined as the perceived number of partners based on equal social exchanges.

*$p < .05$, **$p < .01$.

3 months; they are then questioned about the *direction* of the exchanges on a person-by-person basis. For a global measure of social giving and receiving to be derived, each member of the social network is rated by the participant as either giving emotional and material support to the participant or receiving it from him or her. Therefore, for the purposes of the current study, we defined *giving* as the number of perceived partners to whom respondents believe they gave more than they received; we defined *receiving* as the number of perceived partners from whom respondents believe they received more than they gave. We defined reciprocity as the number of perceived partners to whom respondents gave as much as they received.

Consistent with prior research (S. L. Brown et al., 2003), we did not separate material from emotional support because both are conceptually linked to underlying altruism and are positively correlated. Moreover, our findings did not differ depending on whether we entered material or emotional support in the multivariate model. Therefore, we adopted the use of the composite measure to increase generality. We calculated giving, receiving, and reciprocity scores individually for kin and nonkin sections of the NAP. We improved the positively skewed distribution of scores by using a square-root transformation (Tabachnick & Fidell, 2001).

*Physical health.*—We measured physical health by using the Comprehensive Assessment and Referral Evaluation (CARE) instrument (Golden, Teresi, & Gurland, 1984; Teresi, Golden, Gurland, Wilder, & Bennett, 1984). The CARE instrument was originally designed and has been extensively used to assess health in samples of community-dwelling older individuals in the United States (e.g., Teresi et al.). It is administered in a semistructured interview format and demonstrates good construct, concurrent, and predictive validity (Teresi et al). Specifically, Terresi and colleagues reported that sleeping disorders, ambulation, somatic conditions, and heart disease are predictive of mortality 1 year later. Sample questions involved whether or not the respondent has hypertension (e.g., "Do you have a blood pressure problem?"), hearing (e.g., "Do you have difficulty hearing?"), and sleep disorders (e.g., "Do you sleep during the day for more than 2 hours?"). We used 11 of the 12 health subscales for the current study. We removed the 12th scale, "ambulation," from the total morbidity score as the questionnaire items measuring ambulation are conceptually similar to the capacity to give measure (which focuses on mobility constraints). The 11 scales contained 123 items coded as present or absent and summed to derive a total morbidity score. Increased scores on morbidity index poorer health. Coefficient alphas ranged from .75 to .95 for the subscales. The distribution of morbidity scores was positively skewed, and we improved it by using a square-root transformation (Tabachnick & Fidell, 2001).

*Functional mobility: A proxy for capacity to give.*—We assessed capacity to give by using the Activity Limitation scale of the CARE instrument (Golden et al., 1984; Teresi et al., 1984). This scale contains 39 items measuring the individual's ability to perform activities of daily living (ADLs), such as (a) "Do you have difficulty shopping? If so, is it due to language problems? Or is it due to transportation problems?" (b) "Do you have difficulty reaching your toes?," and (c) "Do health problems limit your social activities?" Despite the large positive correlation between morbidity and activity limitations, these subscales of the CARE are measuring different aspects of adaptive functioning in older adults (see Golden et al. and Teresi et al.). Individuals who are sick will sometimes be activity limited and sometimes not. For example, people who have high

Table 2. Zero-Order Correlations for Kin and Nonkin Giving Models

| | Receiving (Kin) | Giving (Nonkin) | Receiving (Nonkin) | Reciprocity (Kin) | Reciprocity (Nonkin) | Kin (Number) | Nonkin (Number) | Activity Limits | Morbidity | Age | Education | Income | Marital Status | Gender |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Giving (kin) | −.10** | .22** | .00 | −.22** | −.24** | .26** | .12** | −.01 | −.04 | −.01 | −.01 | .08** | .06 | −.05 |
| Receiving (kin) | | .03 | .20** | −.21** | −.05 | .11** | .05 | .12** | .11** | .13** | −.05 | .06* | −.10** | .06 |
| Giving (nonkin) | | | −.02 | .33** | .57** | −.07* | .06 | −.06** | −.11** | −.02 | −.08* | .02 | −.01 | −.11** |
| Receiving (nonkin) | | | | −.21** | −.11** | −.01 | .13** | −.08* | .08** | .05 | .00 | −.04 | .11** | −.03 |
| Reciprocity (kin) | | | | | .51** | .44** | .19** | −.10** | −.00 | −.08** | .07* | .09** | .20** | .05 |
| Reciprocity (nonkin) | | | | | | .25** | .50** | −.08* | −.02 | −.06 | .06* | .01 | −.02 | .15 |
| Kin (number) | | | | | | | .43** | .05 | .12** | .05 | .08* | .05 | .09** | .09** |
| Nonkin (number) | | | | | | | | −.01 | .02 | .02 | .07* | −.07* | −.09** | .10** |
| Activity limits | | | | | | | | | .80** | .21** | −.01 | −.14** | −.13** | .17** |
| Morbidity | | | | | | | | | | .17** | .06 | −.15** | −.09** | .23** |
| Age | | | | | | | | | | | −.08** | −.08** | −.17** | .12** |
| Education | | | | | | | | | | | | .12** | .08** | .01 |
| Income | | | | | | | | | | | | | .25** | −.14** |
| Marital status | | | | | | | | | | | | | | −.29** |

*Notes*: Giving is defined as the perceived number of partners to whom a subject gave more than they received. Receiving is defined as the perceived number of partners from whom a subject received more than they gave. Reciprocity is defined as the perceived number of partners based on equal social exchanges. Marital status was dummy coded such that 0 = single and 1 = married; gender was dummy coded such that 0 = male, 1 = female.

*$p < .05$; **$p < .01$.

blood pressure may or may not have difficulty shopping, touching their toes, or engaging in social activities. Because the inability to complete ADLs seemed likely to interfere with social network functioning, we reasoned that ADL scores should approximate capacity, with higher scores indicating poorer or lower capacity to give. The alpha for the functional mobility scale was .95. The distribution of activity limitation scores was positively skewed, and we improved it by using a square-root transformation (Tabachnick & Fidell, 2001).

### *Data Analytic Procedures*

We first examined how the social network variables varied by ethnicity, and we considered the zero-order relations among the study variables. We tested the primary hypothesis by using multiple regressions in which physical health was regressed on demographic variables (i.e., age, gender, income, marital status, education level), ethnicity, receiving social support from others, giving social support to others, absolute network size, and functional capacity to give. We used this analytic method to test whether or not altruism influenced morbidity above background variables and potential confounds (i.e., network size and functional capacity). We accomplished the testing of whether the effects of support given and received were equivalent across the four ethnic groups by adding Ethnicity × Receiving social support interaction terms and Ethnicity × Giving social support interaction terms to each model. There were four ethnic groups: African American, English-speaking Caribbean, Eastern European, and European American. The European American sample served as a reference group, with dummy codes for the three other groups. We also assessed gender and its possible interaction with giving or receiving support.

## RESULTS

### *Social Networks, Health, and Interrelations Among Study Variables*

As we can see in Table 1, there were significant differences in social network characteristics as a function of ethnicity. An analysis of variance revealed that social network characteristics including size and numbers of kin or nonkin given to and received from differed across the ethnic groups, providing some initial justification for testing whether culture interacts with social giving to predict morbidity.

Table 2 presents the zero-order correlations among the study variables for the kin altruism and nonkin altruism models. As indicated, giving to kin was negatively associated with receiving from kin and positively associated with giving to nonkin, number of kin, number of nonkin, and income. Conversely, receiving support from kin was positively associated with receiving support from nonkin, with number of kin, greater activity limitation (i.e., lower functionality), with income, morbidity, and age, and it was negatively associated with marital status (more likely to be single). Giving to nonkin was associated with a smaller kin network, with lower activity limitation (i.e., greater functionality), with lower morbidity, less education, and gender (more likely to be male). Receiving support from nonkin was associated with a larger nonkin network, with less activity limitation, greater morbidity, and being married. Number of kin in a person's social network was positively associated with nonkin network size, morbidity, education, marital status (more likely to be married), and gender (more likely to be female). The number of nonkin in an individual's social network was positively associated with education and with gender (more likely to be female) and negatively associated with marital status (more likely to be single) and income.

### *Multiple Regression: Altruism and Health*

In this study, we were interested in whether or not altruism is related to health over and above background variables, absolute network size, gender, ethnicity, and activity limitations. In order to test this hypothesis, we conducted two separate regressions for the evolutionarily distinct kin and nonkin domains. We entered activity limitations to determine if altruism accounted for variation in health, even when possible differences in the capacity to give were taken into account.

Table 3. Raw and Standardized Coefficients from a Standard Regression in which Morbidity was Regressed on Demographic Variables, Giving to Others, Receiving from Others, Ethnic Interaction Terms for Giving and Receiving Social Support, Network Size, and Activity Limitation

| | Kin Altruism | | | | Nonkin Altruism | | | |
|---|---|---|---|---|---|---|---|---|
| Variable | *F* | *B* | *SE B* | *B* | *F* | *B* | *SE B* | *β* |
| Age | 90.92** | −.00 | .01 | −.01 | 91.33** | −.00 | .01 | −.01 |
| Education | | .07 | .08 | .02 | | .06 | .08 | .01 |
| Income | | −.05 | .01 | −.06* | | −.04 | .01 | −.05* |
| Marital status | | .06 | .08 | −.02 | | .11 | .08 | .03 |
| Giving to others | | −.09 | .04 | −.05* | | −.07 | .03 | −.07* |
| Receiving from others | | −.05 | .05 | −.04 | | .02 | .07 | .01 |
| Reciprocity | | .03 | .02 | .06 | | .06 | .03 | .06 |
| African American | | −.29 | .15 | −.02 | | −.02 | .10 | −.01 |
| Caribbean | | −.55 | .14 | −.14* | | −.27 | .10 | −.07** |
| Eastern European | | .41 | .17 | .08* | | .47 | .11 | .09** |
| AA × Giving | | .03 | .06 | −.01 | | −.03 | .12 | −.01 |
| AA × Receiving | | .00 | .07 | .00 | | .04 | .09 | .01 |
| AA × Reciprocity | | −.04 | .03 | −.03 | | .10 | .10 | .05 |
| C × Giving | | −.03 | .05 | −.03 | | −.07 | .10 | −.02 |
| C × Receiving | | .06 | .06 | .03 | | .09 | .08 | .03 |
| C × Reciprocity | | −.03 | .03 | −.00 | | .15 | .09 | .05 |
| EE × Giving | | .01 | .06 | .01 | | −.09 | .15 | −.01 |
| EE × Receiving | | −.02 | .08 | −.01 | | .13 | .11 | .02 |
| EE × Reciprocity | | −.02 | .03 | −.02 | | .15 | .12 | .03 |
| Gender | | .30 | .09 | .07** | | .34 | .07 | .09** |
| Gender × Giving | | .02 | .03 | .02 | | .14 | .10 | .06 |
| Gender × Receiving | | .03 | .05 | .02 | | .08 | .06 | −.03 |
| Gender × Reciprocity | | .00 | .04 | .00 | | −.09 | .07 | −.04 |
| Network size | | .03 | .03 | .03 | | .01 | .02 | .01 |
| Activity limitation | | .18 | .00 | .75** | | .18 | .00 | .76** |
| Constant | | 3.09 | .53 | — | | 3.46 | .59 | — |

*Notes*: For the table, $N = 1{,}118$. Giving to others is defined as the perceived number of partners to whom a subject gave more than they received. Receiving from others is defined as the perceived number of partners from whom a subject received more than they gave. Reciprocity is defined as the perceived number of partners based on equal social exchanges. Marital status was dummy coded such that 0 = single and 1 = married; gender was dummy coded so that 0 = male and 1 = female. Kin Altruism Model: ($R^2 = .69$, $p < .01$); Nonkin Altruism Model: ($R^2 = .69$, $p < .01$).

*$p < .05$; **$p < .01$.

*Kin altruism model regression.*—The regression was significant, $F(20, 1{,}080) = 146.07$, $p < .01$. The left-hand panel of Table 3 displays the standardized and unstandardized beta coefficients with all variables in the model. As indicated, the model accounted for 73% of the variance in morbidity. As predicted, giving to kin accounted for a significant proportion of the variance in morbidity over and above demographic factors (i.e., age, gender, education, income, and marital status), ethnicity, network size, and a person's capacity to give; greater support given was related to lower morbidity (i.e., better health). When activity limitations are not entered into the kin model, the influence of altruism on morbidity is similar (without activity limitations—giving to kin; $B = -.05$, $p < .05$). We opted to include activity limitations (for both kin and nonkin) models, as this is a more stringent test of the altruism–health hypothesis. Increased morbidity was also associated with lower income, gender (more likely to be female), greater network size, and greater activity limitation. Reciprocity, age, education, marital status, and level of support received from kin did not predict morbidity in this model, and neither ethnicity nor gender interacted with giving or receiving in predicting morbidity.

*Nonkin altruism model regression.*—The second regression was also significant, $F(20, 1{,}075) = 146.16$, $p < .01$. The right-hand panel of Table 3 displays the standardized and unstandardized beta coefficients with all variables in the model. As indicated, it accounted for 73% of the variance in morbidity. As expected, giving to others accounted for a significant proportion of the variance in morbidity over and above demographic factors (i.e., age, gender, education, income, and marital status), ethnicity, network size, and a person's capacity to give. As with the kin model, increases in social support given to nonkin were related to lower morbidity (i.e., better health). When activity limitations are not entered into the nonkin model, the influence of altruism on morbidity is larger (without activity limitations—giving to kin; $\beta = -.13$, $p < .05$). Increased morbidity was also associated with lower income, gender (more likely to be female), and greater activity limitation. Reciprocity, age, education, marital status, and level of support received from nonkin were not significant predictors of morbidity in this model. Ethnicity and gender did not interact with social giving or receiving to predict morbidity. Unlike the kin-based model, network size was not a significant predictor of morbidity.

## Discussion

Our expectation that the giving of social support would predict lower morbidity was upheld in this sample of community-dwelling older adults. As we predicted, these relations held even with demographic factors (i.e., age, gender, education, income, and marital status) and ethnicity in the model. In addition, controlling for two confounds that prior studies had failed to account for—functional capacity to give and opportunity to give (absolute network size)—did not remove this effect in either model. Conversely, there were no relations between social support received and morbidity in either kin or nonkin models. Ethnicity did not influence the relation between giving and health, despite the baseline differences in social network characteristics (see Table 1). This is consistent with the evolutionary hypothesis that altruism and its proximate causes are universal design features functioning similarly across cultures (Tooby & Cosmides, 1990). Gender did not interact with social support given or received to predict morbidity. Finally, reciprocity was not a significant predictor of morbidity. In the paragraphs that follow, we discuss these results in greater detail and describe the patterns of social support given and received before moving to focus on the implications of our findings and introduce theory to help explain why the giving of support may bequeath health benefits.

A large number of studies have found greater social support associated with decreased morbidity and mortality (Blazer, 1992; House et al., 1982; Kaplan et al., 1988; Kawachi et al., 1996), although other research has failed to find this relation (e.g., S. L. Brown et al., 2003; Hays, Saunders, Flint, Kaplan, & Blazer, 1997; Seeman, Bruce, & McAvay, 1996). Consistent with these latter studies, our examination of 1,118 community-dwelling older adults found no relation between the amount of kin or nonkin social network support received and health. As previous authors have noted, social support is a complex

dynamic that may engender either positive or negative consequences in the recipient (Lu & Argyle, 1992; Seeman, 2000). Social support received under conditions of dependency can create negative emotions (R. M. Brown et al, 1999; de Catanzaro, 1986), which have known relations with immune functioning and health (Cohen, Doyle, Turner, Alper, & Skoner, 2003; Mayne, 2001; Rosenkranz et al., 2003).

In contrast to the null finding of the relation between support received and health, social support *given* was a significant predictor of morbidity in both kin and nonkin models. Specifically, greater giving was associated with reduced morbidity. Earlier we suggested that one possible reason for the complexity of the extant literature relating social network variables and health involved a failure to distinguish between social support given and social support received. Giving social support has previously been associated with benefits in both cross-sectional (Caro & Bass, 1997; Wheeler et al., 1998) and prospective volunteerism research (Musick et al., 1999; Oman et al., 1999), as well as with reduced mortality in a recent longitudinal study of 423 older couples (S. L. Brown et al., 2003).

Previous studies investigating in altruism–health hypothesis have generally failed to control for two potential confounds that may explain the relation between giving and health. It was possible that giving was associated with superior health because the individuals who were giving had greater *opportunity to give* by virtue of having a larger social network. Indeed, consistent with this concern, the current study documented a significant effect of total network size on health (at least in the kin model), despite the fact that we controlled for background factors. As noted, however, scores on both kin and nonkin giving continued to predict superior health even when network size was controlled.

Furthermore, because giving kin and nonkin support is likely constrained by the individual's functional capacity to give, earlier research left open the possibility that the superior health was reported by individuals who gave because these persons were *able* to give. Again, however, in the current study we explicitly controlled for the functional capacity to give—indexed by means of an activity limitation scale—and found that levels of giving were associated with superior health *notwithstanding variations in the person's capacity to give*. This finding suggests there is morbidity variance unrelated to physical limitations but still related to altruism. This might stem from variance in health issues that do not necessarily have accompanying activity limitations (e.g., cancer, sleep disorder), and may occur because altruism influences mental health variance (e.g., Schwartz et al., 2003) or a tendency for more altruistic persons to report fewer health symptoms.

A final, seemingly counterintuitive finding is that respondents who have larger kin giving networks have smaller kin receiving networks. This appears consistent with the hypothesis that kin altruism is not based solely on expectations of reciprocity (Essock-Vitale & McGuire, 1980). Furthermore, this result may be consistent with the hypothesis that kin giving or altruism among older people may be a grandparental investment strategy to increase inclusive fitness (Euler & Weitzel, 1996; Lee, 2003) or, more generally, that the balance of giving and receiving varies depending on both individual and network considerations.

### *Limitations and Future Directions*

Although these data comprise an important contribution to current thinking about the relation between social network variables and health outcomes, there are weaknesses that constrain interpretation. First, because the social network instrument asks participants to list individuals in their network and indicate if they gave more than they received, it does not include the motivation of the giver and must be considered only a proxy for psychological altruism. Furthermore, the specific "content" or "amount" given, received, or exchanged among social partners was not measured in the current study. However, it might be expected that *levels* of giving could be related to health (e.g., money given for cab fare vs. a downpayment on a new house), as it has been in prior studies (e.g., Connell, Fisher, Edwin, & Houston, 1992). Future research should explore if amount given is related to health status and whether the content of what is given (e.g., material vs. emotional support) is relevant. It has been suggested in the volunteerism literature on health and aging that a relatively small amount of helping is beneficial (Van Willigen, 2000).

As a result of the self-report nature of the network instrument, it may be suggested that people who perceive themselves more positively are healthier and may overestimate their contribution relative to others. Finally, the self-report network instrument used in this study does not clarify the role of the spouse in either giving or receiving support. It seems likely that social support (or lack of it) from spousal sources influences a person's health.

A second issue limiting the generalizability of our findings is that the community-dwelling older adults in our sample are particularly healthy and the relation between altruism and health may not generalize to the "oldest old" cohort. Indeed, there are reasons to believe that the challenges faced by the oldest old (e.g., people older than 85 years) may influence the relation between received social support and health.

Finally, the small effect sizes reported here may suggest that the relation between altruism and health is somewhat trivial (Cohen, 1992). However, although altruism is only one of many correlates with morbidity, such a characterization might be misplaced. First, it is worth noting that income accounted for less morbidity variance in our multivariate models than altruism, and socioeconomic status is an important predictor of health. Furthermore, and as has been noted previously (Friedman & Booth-Kewley, 1987), the small effect sizes associated with psychosocial variables may remain important because they affect a large number of people (Magai, Kerns, Gillespie, & Huang, 2003) and capacitate interventions among variables amenable to change.

It must be acknowledged that the current study was correlational and does not permit confident conclusions on the underlying reasons for the effects. Despite the weakness of the correlational design, there are a number of future research possibilities. One initial possibility is that individuals who are more robust can afford to give more to others. Although we cannot rule this possibility out, the fact that giving continued to predict health when activity limitation was controlled militates against such an interpretation. Experimental studies are now needed to explicitly test this parsimonious hypothesis.

An alternate hypothesis is that the proximate emotions motivating altruistic giving improve health. At a proximate level, positive affect appears to influence helping behavior (e.g.,

Aderman, 1972; Isen & Levin, 1972; W. M. Brown et al., 2003), and positive affect may, in turn, affect health (Cohen et al., 2003; Frank, 1988; McClelland & Kirshnit, 1988; Rein, Atkinson, & McCraty, 1995). Positive affect while helping others may be a form of eudaemonic well-being—a strong positive predictor of good health—as opposed to hedonic well-being (Ryff, Singer, & Love, 2004). Although further experiments are needed to assess this possibility, positive emotions and altruism have been linked to a superior immune response (Cohen et al.; McClelland & Kirshnit; Rein et al.; Rosenkranz et al., 2003), perhaps implying that the reported associations between altruism and health outcomes may have an emotion-neuroendocrine basis (Knox & Uvnas-Moberg, 1998). Consistent with this view, increases in positive social relations—all correlates of altruism—have been associated with a lower likelihood of getting a cold after being inoculated with rhinovirus (Cohen et al.). Likewise, experiencing compassion (Rein et al.) and watching the altruism of others (McClelland & Kirshnit) have been related to increased salivary immunoglobulin A (S-IgA) levels, which, in turn, is associated with a lower incidence of diseases.

Personality appears to be linked to altruism (Brown et al., 2003; Frank, 1988; Jensen-Campbell et al., 1995). Prosocial individuals who have more positive affect may signal these attributes to others and receive more positive support (Brown & Moore, 2002) and perhaps mating opportunities (Jensen-Campbell et al.). This perspective suggests that there may be different evolutionary pathways for the health associations with altruism for different genders. For example, Jensen-Campbell and colleagues (1995) found that dominant men who were altruistic were perceived as particularly attractive by women. On the basis of the model of Jensen-Campbell and colleagues, we may predict that dominant altruistic men (but not women) will be healthy because they are broadcasting genetic quality. For women, the relation between health and altruism may occur later in development in line with the grandmother hypothesis as a strategy to increase the fitness of close kin rather than attracting mates. Future research should seek to extend the current findings to male and female individuals of different ages.

## *Conclusions*

Given the previously reported health benefits to older adults who offer informal and formal assistance (Hainsworth & Barlow, 2001; Luoh & Herzog, 2002; S. L. Brown et al., 2003), experiments are now needed to isolate the causal mechanisms. In the current study we found that both kin and nonkin giving was associated with improved health, notwithstanding variations in opportunity to give or functional capacity to do so. Although the associations uncovered in this study are modest and the data remain correlational, our test of the altruism–health hypothesis was stringent and controlled for previously unmeasured factors. The relation between altruism and health remained even when a large number of variables were controlled and did not vary as a function of ethnicity or gender.

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