Journal of Gerontology: SOCIAL SCIENCES
1999, Vol. 54B, No. 3, S173–S180

Volunteering and Mortality Among Older Adults: Findings From a National Sample

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Objectives. Although a number of authors have proposed that older volunteers should benefit in terms of better health and well-being, few researchers have examined the issue empirically to see whether this is true. The purpose of this article is to build on this literature by empirically examining the association between volunteering and mortality among older adults.

Methods. Using data from a nationally representative sample, we use Cox proportional hazards regression to estimate the effects of volunteering on the rate of mortality among persons aged 65 and older.

Results. We find that volunteering has a protective effect on mortality among those who volunteered for one organization or for forty hours or less over the past year. We further find that the protective effects of volunteering are strongest for respondents who report low levels of informal social interaction and who do not live alone.

Discussion. We discuss the possibility that the curvilinear relationship we observe between volunteering and mortality is due to a combination of factors, including self-identity, role strain, and meaningfulness. Other research using more precise data is needed to determine whether these ideas are supportable.

ADVANCES over the past century in health and longevity have left many older adults with a number of years of life following retirement. Although there is a great deal of heterogeneity in how older adults spend their post-retirement years, several authors (e.g., Chambré, 1993; Herzog, Kahn, Morgan, Jackson, & Antonucci, 1989; Herzog & Morgan, 1993; Hodgkinson & Weitzman, 1988) have noted that many engage in volunteering or work for voluntary organizations. If it is true that many older adults spend some of their time volunteering, then it may be the case that the upcoming surge in the elderly population due to the baby boomers hitting retirement age will yield a vast new crop of volunteers. If federal and state governments continue to cut back on spending for social welfare programs, this pool of volunteers may become increasingly important to the overall maintenance of our society.

In addition to the societal benefits that accrue through volunteering, such behavior might also have positive health effects for volunteers. For instance, it has been suggested that elderly volunteers should benefit from volunteering through increased levels of life satisfaction and self-esteem, feelings of usefulness, and through the betterment of health (Hunter & Linn, 1980-81). Moreover, given that many older adults have exited the work role through retirement, volunteering and other helping behaviors may act as a way to fill in for lost roles (Chambré, 1987; Hunter & Linn, 1980-81; Ward, 1979). Fischer and Schaffer (1993) have termed this overall perspective "inoculation." In explaining the perspective, they state, "volunteer work can inoculate, or protect, the older person from the hazards of retirement, physical decline and inactivity" (pp. 9–10).

However, little research has examined whether voluntary activity actually promotes better health and well-being (Fischer & Schaffer, 1993; Monk, 1995). The few studies done have largely supported the notion that volunteering is beneficial (e.g., Krause, Herzog, & Baker, 1992; Luks & Payne, 1992; McIntosh & Danigelis, 1995; Sabin, 1993; Ward, 1979; Young & Glasgow, 1998), but data and analytical limitations of these studies have compromised their ability to make statements about the relationship between volunteering and well-being. One common problem cited by multiple scholars (e.g., Chambré, 1987; Fischer & Schaffer, 1993; Okun, Stock, Haring, & Witter, 1984) is disentangling causality. That is, because good health and availability of social resources lead to volunteering, it is difficult to determine the causal ordering between well-being and that activity. Thus, more research is needed to determine whether volunteering does indeed affect the lives of elderly adults in beneficial ways (Herzog & House, 1991; Monk, 1995).

The purpose of this study is to examine the relationship between volunteering and mortality using data from a prospective, nationally representative data set. Our research expands upon extant research that has linked various forms of social participation and integration to mortality (e.g., Berkman & Syme, 1979; Bryant & Rakowski, 1992; House, Robbins, & Metzner, 1982; Rushing, Ritter, & Burton, 1992; Strawbridge, Cohen, Shema, & Kaplan, 1997). By adjusting for several possible confounding factors, such a prospective analysis of mortality overcomes the problems of potential reverse or reciprocal causation encountered in earlier studies of volunteering and well-being. Finally, based on the role context perspective, we test hypotheses that the relationship between volunteering and mortality is moderated by other measures of social integration.

Theoretical Overview

Why might volunteering affect the mortality rates of older adults? The most plausible explanation involves the utility of roles. It has been suggested that for older adults who have mostly or fully disengaged from the formal work sphere, volunteering can become an important social role (Chambré, 1987). Evidence not directly related to volunteering has indicated that engaging in

multiple roles can reduce the risk of mortality. In their study of roles and longevity among women, Moen, Dempster-McClain, and Williams (1992) used 30-year mortality follow-up data to show that the number of roles engaged in by respondents was inversely related to risk of mortality. Moreover, they found that the role that had the strongest protective effect on mortality was that of being a member of a club or organization; consequently, they argued that "while roles generally may contribute both stress and support to women's lives, participation in voluntary associations may produce more benefits than costs" (p. 642).

Moen and colleagues (1992) delineate three commonly held perspectives on the nature of roles. Role enhancement argues that accumulated roles serve to enhance or increase power and status, which in turn translates into better health. Role strain claims that too many roles can place a burden on the individual, which in turn results in worse health outcomes (see also Pearlin, 1983). Finally, they cite the role context viewpoint, which takes into account the number of roles as well as the setting and content of those roles.

These three perspectives can be applied profitably to the study of volunteering and well-being. It is generally believed that volunteering provides role enhancement. That is, the additional volunteer role should serve to increase feelings of power and status, and of meaning to oneself and to others. It might also be the case, however, that for older adults who suffer declines in function and ability, the additional volunteer role could become a burden. Indeed, one might expect that those who volunteer in great amounts or for numerous groups will not receive the potential health benefits of volunteering. In short, it is volunteering in moderation that should be valuable for health and mortality outcomes.

The third role perspective discussed by Moen and colleagues (1992), role context, suggests that the effects of volunteering may not be equally evident for all older adults. Given the importance of social integration for mortality as described in previous studies (e.g., Berkman & Syme, 1979; House et al., 1982), individuals who are less well integrated into society (e.g., via marriage or contact with friends and family) might benefit most from volunteering. Likewise, persons who otherwise enjoy high amounts of social integration may not receive many benefits from volunteering in that they already receive through other means any benefits that may come from volunteering.

Hypotheses and Model Specification

Given the theoretical issues outlined above, we offer the following hypotheses:

Hypothesis 1	Volunteering in modest amounts is associated with lower risk of mortality.
Hypothesis 2	Volunteering in large amounts is associated with no differential risk or higher risk of mortality.
Hypothesis 3	The effect of volunteering on the risk of mortality is strongest among those who display low levels of social integration.

The central part of these hypotheses is tested by regressing mortality on volunteering and other control variables. We use two measures of the volunteering: range and amount. The other control variables consist of a number of variables related to mortality and volunteering, including measures of physical activity, physical health, socioeconomic status, social integration, and demographic characteristics.

METHODS

Data

Data for this study come from the *American's Changing Lives* (ACL; House, 1995) data set. The data are a multistage stratified area sample representative of the noninstitutionalized U.S. population aged 25 and older with a response rate of 67% of sampled individuals and 68% for sampled households. The data were collected over three waves in 1986 (N = 3,617), 1989 (N = 2,867), and 1994 (N = 2,348) through face-to-face interviews conducted in the respondents' homes. In order to facilitate subgroup analyses by age and race, the data set contains an oversample of Blacks and adults aged 60 and older. All the analyses reported here use weighted data in order to adjust for the oversamples and biases due to nonresponse. The present analyses focus on respondents aged 65 and older and use data collected in the first wave and the follow-up mortality data, yielding a total unweighted sample size of 1,211. Because the ACL data were collected using a complex sampling design, the variances of the estimates in the regression models may be understated if one assumes a simple random sample, as is done in most tests of statistical significance. As such, we adjust for the sampling design effects using SUDAAN (Shah, Barnwell, & Bieler, 1997), which makes the necessary adjustments to the variances using Taylor series linearization procedures. There are very few cases with missing data on the variables; for those with missing data, values were imputed based on other available information in the data, or via substituting a modal, mean, or median value if such relevant information was not available.

Measures

Mortality.—Deaths were ascertained through tracking and interviewing processes and via the National Death Index from mid-1986 through March 1994, yielding an average follow-up of 7.5 years. To date, the vast majority of the 403 deaths (90.3%) have also been confirmed through death certificates. Reviews of reported deaths not yet confirmed by death certificates suggest that all of these are almost certainly dead.

Volunteering.—Respondents were asked whether they had volunteered in the past year for any of the following groups: (a) church, synagogue or other religious organization; (b) school or educational organization; (c) political group or labor union; (d) senior citizen group or related organization; and (e) other organizations. Respondents could have acknowledged volunteering for more than one of these groups. We calculated the volunteering range measure by summing the number of groups mentioned. Because we are interested in how much volunteering respondents did rather than what type they did, we did not include information about the type of groups for which people volunteered. Respondents who said they had volunteered were also asked about how much time they had spent volunteering across all groups during the past year. Response categories for this question included less than 20 hours, 20–39 hours, 40–79 hours, 80–159 hours, and 160 hours or more. Midpoint values are assigned to represent each category in the volunteering range measure. For the top category, a value of 200 was assigned.

From our hypotheses we expect the greatest benefits of volunteering to come from modest amounts of that activity. Hence,

we coded the volunteering variables as dichotomous dummy variable classifications. For range, the variables indicate volunteering for (1) one group and (2) two or more groups. For amount, the variables indicate volunteering (1) less than 40 hours and (2) 40 or more hours. The reference category for both sets of variables is no volunteering. It is important to note that volunteering amount and range are highly correlated (r = .66) and, for that reason, are subject to multicollinearity problems when assessing their effects in a multiple regression framework. To overcome this problem, we estimated the effects of each set of dummy variables in its own series of models.

Social integration.—Our first measure of integration, informal social interaction, is an index constructed by taking the standardized mean of two items: (a) how often respondents talk on the phone with friends, neighbors, or relatives in the typical week; and (b) how often they get together with friends or relatives. The response categories for the first item range from (1) never to (6) more than once a day, and for the second item they range from (1) never to (6) more than once a week. Our second measure of social integration indicates whether respondents lived alone. Such a measure is a better indicator of integration than marital status in that it reflects the possibility that an older adult is married but that the spouse lives in another setting and also the residential social integration of unmarried persons. Respondents were coded one on this variable if they reported living alone and zero otherwise.

Physical activity.—Our measure of physical activity is derived from three variables that measure how often (from [1] never to [4] often) respondents engage in (a) active sports or exercise, (b) gardening or yard work, and (c) taking walks. The index was created by taking the standardized mean of the three items. For these analyses, we have split the index into quintiles of roughly equal size to accommodate the possibility of a nonlinear relationship.

Health.—Physical health status was measured using two variables. The first (*functional impairment*) is a functional health index with a four-level Gutman-type scale that reflects the severity of physical impairment. Categories include (1) no limitation; (2) difficulty walking a few blocks or climbing a few flights of stairs; (3) difficulty doing heavy work around the house (such as shoveling snow or washing walls); and (4) being confined to a bed or chair. We dichotomized the scale such that respondents who report any impairment are coded one whereas those with no impairment are coded zero. The second measure (*potentially fatal conditions*) is a tally of the number of possibly fatal health problems experienced by respondents over the past year. Conditions include lung disease, heart attack, diabetes, cancer, and stroke.

Controls.—Other control variables include sex (*female*: 0 = male, 1 = female), race (*Black*: 0 = non-Black [95.1% of whom are White], 1 = Black), age (*age*: in years, range 65–96), education (*education*: in years, range 0–17), and household income (*income*: coded as midpoints, 10 categories ranging from less than $5,000 to $80,000 or more, with a Pareto estimate for the highest category). In earlier forms of the analyses we included controls for employment, formal social interaction, and self-rated heath. To simplify the models, we did not include them in the final analyses. Doing so had no effect on the association between volunteering and mortality.

Analyses

To assess the effects of volunteering and the other factors on mortality, we use hierarchical Cox proportional hazards models (Allison, 1995). First, we entered only the volunteering variables. Next, we controlled for demographic characteristics and then for socioeconomic status. In the fourth model, we included measures of health and physical activity. In the final model we added indicators of social integration. By regressing mortality on the variables in this fashion, we can determine what factors, if any, tended to erode an otherwise significant zero-order relationship between volunteering and mortality.

To test the interaction effects, we created cross-product terms between the volunteering variables and each of the social integration measures, rendering two sets of two cross-product terms for each volunteering measure (i.e., range or amount). Each set of terms is entered into the full main effects model to test the moderating effects in question. Following those tests, we divide the sample by levels of social integration then regress mortality on volunteering and the other covariates. Such a strategy allows us to determine the effects of volunteering at specific levels of integration.

Results

Table 1 shows the descriptive statistics for the independent variables and zero-order correlations between those variables, volunteering, and mortality. In the first two columns of the table, we display the range and mean for each of the variables. Note that for the dichotomous variables, the mean indicates the proportion of people in the category coded one. For example, 18% of the sample volunteered for one organization. Adding the totals for the volunteering dummies, we see that about 35% of the total sample volunteered in the past year. This level of volunteering among older adults is similar to that found by Hodgkinson and Weitzman (1988). The mean number of hours volunteered in the past year is somewhat low (27.7 hours) but reflects the high number of people who did not volunteer. In terms of the demographic and socioeconomic variables, a majority of the sample was female (60%) and non-Black (91%), the mean age of the sample was about 73, the mean level of education was less than high school, and the mean income was about $18,000. In terms of health, the mean number of fatal conditions was less than one, and a minority of respondents (40%) reported some functional impairment. Finally, a minority of the sample (29%) reported living alone.

The latter three columns of the table report the zero-order correlations between the independent variables and mortality and volunteering. In terms of volunteering, being Black and older were associated with less volunteering. Consistent with other studies of volunteering (e.g., Wilson & Musick, 1997), education and income were positively related to both volunteering range and amount. Respondents who reported better health and more physical activity also volunteered more. Similarly, people who were more socially integrated volunteered more than those who were not.

Looking at the correlations with mortality, respondents who volunteered over the past year were less likely to die over the follow-up period; however, the pattern is curvilinear. That is, the protective effects of volunteering were strongest among those volunteering for one organization or for less than forty hours. The other associations with mortality in this table are not

Table 1. Descriptive Statistics and Zero-Order Correlations With Volunteering and Mortality ($N = 1,211$)

	Range	Mean	r with Volunteering		r with Mortality
			Range	Amount	
Volunteering					
Range (overall)	0–3	.57	—	.66***	–.12***
1 organization	0–1	.18	—	—	–.15***
2+ organizations	0–1	.16	—	—	–.05+
Amount (overall)	0–200	26.97	.66***	—	–.07**
< 40 hours	0–1	.17	—	—	–.12**
≤ 40 hours	0–1	.18	—	—	–.09**
Sociodemographics					
Female	0–1	.60	.02	–.01	–.22***
Black	0–1	.09	–.05+	–.06*	.05
Age (years)	65–96	73.04	–.09***	–.15***	.37***
Socioeconomic status					
Education (in years)	0–17	10.64	.22***	.32***	–.14***
Income (in thousands)	2.5–110	18.41	.11***	.19***	–.18***
Health Status and Activity					
Functional impairment	0–1	.40	–.14***	–.17***	.20***
Potentially fatal conditions	0–3	.41	–.14***	–.09***	.15***
Physical activity (z score)	–2.47–1.50	–.35	.20***	.27***	–.19***
Social Integration					
Lives alone	0–1	.29	–.07*	–.00	.02
Informal integration (z score)	–3.07–1.35	–.04	.22***	.22***	–.17***

+ $p < .10$; * $p < .05$; ** $p < .01$; *** $p < .001$.

surprising: being female, younger, of higher socioeconomic status, more integrated, more active, and more healthy were associated with survival over the follow-up period.

Table 2 presents the models in which mortality was regressed on the volunteering range dummy variables and controls. It is important to note that the figures shown in this table are hazard rate ratios; as such, coefficients greater than one indicate a greater hazard rate for death whereas those less than one indicate a smaller hazard rate. Model 1 includes only the volunteering range variables. It shows that respondents who volunteered were at a reduced risk for mortality. The strongest effect (i.e., the lowest hazard rate ratio for mortality) occurred for those volunteering for only one organization, again reflecting a curvilinear pattern.

In Model 2 we adjusted for the demographic factors. It is readily apparent that the beneficial effects of volunteering decreased (i.e., hazard rate ratios became closer to 1.0) upon inclusion of these variables, but the curvilinearity of the effect became more clear: though the effect of volunteering for one group was still significant, the effect of volunteering for two or more groups became insignificant. Age and sex both had strong effects in the usual directions. Separate analyses (not shown here) indicated that although both age and gender decreased the effect of volunteering, the inclusion of age resulted in the largest decrease.

In the third model, we included the socioeconomic variables. Recall from Table 1 that levels of volunteering activity were sharply graded by socioeconomic status. Consequently, we would expect that the inclusion of these variables would also curtail the volunteering effects. It was the case that the effect of volunteering for one organization decreased, but this reduction was small, with the effects of the other volunteering variable decreasing more. After incorporating measures of health and physical activity in Model 4, the effect of volunteering for one organization decreased a small amount but still remained significant whereas higher levels of volunteering produced a higher (i.e., >1.0) hazard rate ratio for mortality. In terms of the other variables, higher levels of physical activity were associated with a lower mortality rate, and reporting more fatal conditions or some functional impairment was associated with a higher rate.

In the final model, we included two measures of social integration; the inclusion of these variables did little to affect the association between volunteering and mortality. It is surprising that we found no significant effect for social integration given mortality studies done by other researchers that showed such an effect (e.g., Berkman & Syme, 1979; Blazer, 1982; House et al., 1982). Note, however, that these studies were generally geographically limited, dealt mostly with younger populations, and did not include a measure of volunteering.

Table 3 shows the mortality hazard rate ratios for volunteering amount and the other control variables. The effects for volunteering amount were very similar to those for volunteering range: volunteering in modest amounts (less than forty hours) had a protective effect on mortality whereas volunteering for forty or more hours had no effect. However, the effect of volunteering for a modest number of hours was not as strong as the effect of volunteering for one organization. Indeed, although the effect of volunteering less than forty hours remained significant throughout the models, it only remained marginally so in the last model.

The final part of our analyses tested our third hypothesis. Basically stated, we expected that the effect of volunteering on

Table 2. Estimated Net Effects of Volunteering Range and Other Variables on Mortality (Cox Proportional Hazards Estimates; $N = 1,211$)[a]

	Model 1	Model 2	Model 3	Model 4	Model 5
Volunteering (ref: no vol.)					
1 organization	.40***	.48***	.50**	.58*	.60*
2+ organizations	.65*	.77	.86	1.07	1.11
Sociodemographics					
Female		.45***	.42***	.35***	.37***
Black		1.26*	1.13	1.03	1.02
Age (ref: 80+)					
65–69 years		.21***	.24***	.27***	.27***
70–74 years		.35***	.38***	.41***	.42***
75–79 years		.68**	.71*	.72*	.72*
Socioeconomic Status					
Education (ref: 16+ years)					
0–11 years			1.00	.99	.96
12–15 years			.96	1.04	1.03
Income (ref: ≥ $30,000)					
< $10,000			2.32**	2.15**	2.19**
$10,000–$29,999			1.86+	1.78+	1.82*
Physical Activity and Health					
Activity (ref: low level)					
Middle Low				1.04	1.07
Middle				.75	.78
Middle High				.61*	.61*
High				.45**	.47*
Potentially fatal conditions				1.22**	1.21**
Functionally impaired				1.35+	1.35+
Social Integration					
Lives alone					.93
Informal social interaction					.92
χ^2 / df	40.70 / 2	238.47 / 7	258.30 / 11	315.89 / 17	319.59 / 19
Pseudo R^2	.03	.16	.18	.21	.21
$\Delta\chi^2$ / Δdf	—	197.77 / 5	19.83 / 4	57.59 / 6	3.70 / 2
p: $\Delta\chi^2 = 0$	—	***	***	***	

[a] All entries are hazard rate ratios.
+ $p < .10$; * $p < .05$; ** $p < .01$; *** $p < .001$.

mortality would be strongest among older adults who reported lower levels of social integration, measured either by living arrangements or by informal social interaction. To test this hypothesis, we entered all of the variables in the full main effects models and then included cross-product terms between the volunteering variables and one of the social integration variables. Consequently, each of four models contained one set of volunteering variables, control variables, and cross-product terms between volunteering and one social integration variable. In order to save space, we do not report these results in tabular form in this article; they are, however, available from the authors upon request.

For informal social interaction, we found a significant moderating effect for volunteering for one organization. In line with our expectations, the coefficient revealed that the protective effect of volunteering for one organization was strongest among individuals who engaged in little informal social interaction (b = .63, $p < .05$). We further found that living alone had slight moderating effects for volunteering for one organization (b = .67, $p < .10$) and volunteering for less than forty hours (b = .59, $p < 10$). However, the direction of the effect was not expected: the signs of the coefficients indicated that the effects of volunteering were strongest among people who did not live alone. Finally, to determine whether the addition of the cross-product terms added to the overall fit of the models, we computed chi-square difference tests between the final additive effects models shown in Tables 2 and 3 and the models with the cross-product terms. Only the chi-square difference for the model for informal social interaction and volunteering range cross-product terms was significant (χ^2, $df = 9.43, 2$; $p < .05$). As such, this is the only effect we will discuss further.

Because cross-product terms can often be difficult to interpret, we divided the sample at the mean level of informal social interaction and computed the effects of volunteering within each of those subgroups, adjusted for all of the control variables. Table 4 displays the results of these analyses. According to the hazard rate ratios shown in the table, the effects of volunteering for one organization are strongest among respondents who engage in low levels of informal social interaction. This result is consistent with the findings for the cross-product terms.

Table 3. Estimated Net Effects of Volunteering Amount and Other Variables on Mortality (Cox Proportional Hazards Estimates; $N = 1,211$)[a]

	Model 1	Model 2	Model 3	Model 4	Model 5
Volunteering (ref: no vol.)					
< 40 hours	.46***	.54**	.59**	.68*	.70+
≥ 40 hours	.58*	.68+	.71	.89	.93
Sociodemographics					
Female		.45***	.42***	.35***	.37***
Black		1.25*	1.13	1.03	1.02
Age (ref: 80+)					
65–69 years		.22***	.25***	.27***	.27***
70–74 years		.35***	.38***	.41***	.41***
75–79 years		.68**	.71*	.72*	.73*
Socioeconomic Status					
Education (ref: 16+ years)					
0–11 years			.95	.94	.91
12–15 years			.92	.98	.97
Income (ref: (≥ $30,000)					
< $10,000			2.26**	2.06**	2.09**
$10,000–$29,999			1.84*	1.75*	1.78*
Physical Activity and Health					
Activity (ref: low level)					
Middle Low				1.04	1.07
Middle				.75	.77
Middle High				.60*	.61*
High				.47**	.48*
Potentially fatal conditions				1.22**	1.21**
Functionally impaired				1.37*	1.37*
Social Integration					
Lives alone					.93
Informal social interaction					.92
χ^2 / *df*	36.44 / 2	234.03 / 7	252.23 / 11	309.04 / 17	312.72 / 19
Pseudo R^2	.03	.16	.17	.20	.21
$\Delta\chi^2$ / Δ *df*	—	197.59 / 5	18.20 / 4	56.81 / 6	3.68 / 2
p: $\Delta\chi^2 = 0$	—	***	**	***	

[a] All entries are hazard rate ratios.
+ $p < .10$; * $p < .05$; ** $p < .01$; *** $p < .001$.

Table 4. Estimated Net Effects of Volunteering on Mortality by Levels of Social Integration (Cox Proportional Hazards Estimates; $N = 1,211$)[a]

	Informal Social Interaction		
	High	Low	$p : b_H = b_L$[b]
Volunteering Range			
1 organization	.86	.33**	*
2+ organizations	1.01	1.22	
Volunteering Amount			
< 40 hours	.73	.59	
≥ 40 hours	1.13	.68	

[a] Hazards rate ratios are shown. Estimates for the range variables are generated in separate models than those for the amount variables. All estimates are adjusted for the variables shown in Tables 2 and 3.
[b] Asterisks indicate a significant interaction effect between volunteering and the dichotomous form of social interaction.
* $p < .05$; ** $p < .01$.

Discussion

The purpose of this study was to determine whether there is evidence to support the notion that volunteering has protective mortality effects for older adults. Our results lend support to this idea in that volunteers had a lower adjusted mortality hazard than nonvolunteers. However, such a statement must be qualified in several ways.

Not all volunteers were protected by that activity. Rather, volunteering only in moderate amounts produced a lower risk of mortality. These effects were strong in bivariate analyses but were attenuated upon the inclusion of demographic characteristics, such as age and gender. This curvilinear effect for volunteering supports both the role enhancement and role strain perspectives. In terms of the former, the findings indicated that simply adding the volunteering role was protective of mortality. To gain the protective effect, one did not have to volunteer to a great extent. Indeed, volunteering at higher levels provided no protective effect. This finding is consonant with the role strain hypothesis, which would argue that for older adults, taking on too much volunteering activity incurs just enough detriments to offset the potential beneficial effects of the activity. We cannot, however, directly test with

our data the major assumption of the role strain hypothesis: volunteering for more than one group or for more than 40 hours during the past year—which in most cases is between 40 and 80 hours—actually results in increased role conflict or additional work that constitutes a burden. Future analyses should attempt to resolve this issue with more specific data on the nature and experience of volunteer work and other forms of productive activity.

The role context perspective also receives some support. That is, we found that the effect of volunteering on mortality differed depending on the level of social integration of the respondent. We expected that the protective effect of volunteering would be strongest among those with lower levels of social integration. That expectation was met for informal social interaction but not for living arrangements. In the latter case, the protective effects of volunteering were marginally strongest among respondents who were living with others. In an effort to resolve this counterintuitive finding, we computed several sets of analyses using alternative interaction effects (e.g., with gender) to determine whether some other factor was driving this pattern. We found no evidence that other factors were responsible for the effect. Pending additional and stronger replication of the result, we do not believe it should be interpreted further.

Given that the effects of volunteering for one group were somewhat stronger than those for volunteering for a few hours, we are led to ask several questions. First, are respondents who volunteered for one organization different in some way than respondents who volunteered for more than one organization? To answer this question, we computed mean levels of the other variables (i.e., demographics, socioeconomic status, health, social interaction) by the number of organizations volunteered for. In these analyses (not shown here), we did not uncover any clear pattern of differences between respondents who volunteered for one organization and those who voluteered for more groups. It could be the case that respondents who only volunteered for a single organization were different from others in some way, but we are unable to tap those differences here. It may also be the case that respondents who volunteered for one organization had a stronger intrinsic interest in that organization than did respondents who volunteered for multiple organizations. Given that we have partly rested our belief that volunteering will be protective on Chambré's (1987) notion that volunteering can provide meaningful social roles for older adults, it may be the case that older adults who volunteered for one group derived a more meaningful experience from that activity than multiple-group volunteers. Further, it might be the case that simply being able to take on the identity of a volunteer is beneficial for survival. If having the volunteer identity itself is important, but actually doing volunteer work is not as important, then we would expect that the strongest effects of volunteering would be in the lowest volunteering category. We cannot directly test the validity of these claims using the data available to us. Future research, however, should consider these possibilities.

The second question we must ask is whether respondents who volunteered for one group actually performed different types of activity than did respondents who volunteered for multiple groups. For example, it may be the case that single-group volunteers were more likely to volunteer in ways that bring higher prestige than were volunteers who worked for multiple organizations. The data available in the ACL provide measures of the types of organizations for which respondents could volunteer; however, the data do not contain information on the types of work that were actually performed. Future research should take the type of work into consideration when examining the effects of volunteering on health. We did test whether the type of organization volunteered for had an effect on mortality, but we found no evidence to support this idea.

It should be noted that many individuals in our sample who reported volunteering did so for a religious organization (about 69%). This distribution of volunteers raises the possibility that what may actually be responsible for the effects of volunteering on mortality is association with a religious group. There is evidence that attending religious services is associated with mortality such that persons who attend more frequently derive protective benefits from that activity (e.g., Hummer, Rogers, Nam, & Ellison, in press; Strawbridge et al., 1997). In analyses not shown here, we tested the possibility that the volunteering-mortality relationship was due to religion by recomputing the final main effects model with a measure of religious service attendance. The effect of volunteering in this model was unchanged, indicating that religious activity was not responsible for the effect.

In sum, we found support for the idea that volunteering is beneficial for older adults in terms of mortality. By using nationally representative data that contain measures of both volunteering and other important constructs, we were able to overcome many of the limitations that hindered previous research. Moreover, because we focused prospectively on mortality as our outcome of interest, we avoided the problem of causal ordering that has plagued many of the previous cross-sectional studies in this area. Although our work is certainly not definitive, due in part to several of the limitations listed above, it does provide more evidence that social participation in later life may contribute to successful aging (Rowe & Kahn, 1998).

ACKNOWLEDGMENTS

This work was supported in part by a grant from the Michigan Exploratory Center for the Demography of Aging (Dr. Musick), by grants P01AG05561 and R01AG09978-01 from the National Institute on Aging, National Institutes of Health, Bethesda, MD (Drs. Herzog and House), by an anonymous donor (Dr. Herzog), and by a Health Investigator Award from the Robert Wood Johnson Foundation, Princeton, NJ (Dr. House).

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Received July 23, 1998
Accepted January 5, 1999