

**DOES THE RELATION BETWEEN VOLUNTEERING
AND WELL-BEING VARY WITH HEALTH AND AGE?***

MORRIS A. OKUN, PH.D.

REBECA RIOS, PH.D.

AARON V. CRAWFORD, MA

ROY LEVY, PH.D.

Arizona State University, Tempe

ABSTRACT

Previous studies have established a positive association between organizational volunteering and well-being. In the current study, we examined whether the relations between organizational volunteering and positive affect, negative affect, and resilience are modified by respondents' age and number of chronic health conditions. This study used cross-sectional data from the 2008 Arizona Health Survey of residents 18 years old and older ($N = 4,161$). Multiple regression analyses provided no support for the hypothesis that age moderates the association between volunteer status and positive affect, negative affect, and resilience. In contrast, there was a significant ($p < .05$) interaction between volunteer status and chronic health conditions on positive affect and resilience. Consistent with the compensatory hypothesis, as number of chronic health conditions increased, the relations between volunteering and positive affect and resilience scores increased. Implications of these findings for increasing volunteering among adults with multiple chronic health conditions are discussed.

*This work was supported by funds provided by the St. Lukes Health Initiative to the Resilience Solutions Group at Arizona State University. The authors were not involved in designing the survey, drawing the sampling frame, or collecting the data.

Organizational volunteering has been defined as an unpaid activity that involves “taking actions within an organizational framework that potentially provides some service to one or more other people or to the community at large” (Piliavin & Siegl, 2007, p. 454). For the 12-month period from September 2007 through August 2008, the U.S. Department of Labor reported that the rate of volunteering among people 16 years old and older in the United States was 26.4%. The median number of hours volunteered in this population was 52 hours. It was estimated that the aggregate number of hours volunteered per year in the United States exceeded 3 billion hours. With respect to societal benefits, economists estimated that the monetary contribution associated with volunteering in the United States exceeded 65 billion dollars (U.S. Department of Labor, 2009). Volunteering has been touted as having a positive impact not only on society, but also on the individuals who provide assistance to others (Gottlieb & Gillespie, 2008).

The current study was designed to address the question of whether there are individual differences in the benefits that adults derive from volunteering. More specifically, we carried out a secondary data analysis of a state-wide survey in Arizona to investigate whether the relations between volunteering and measures of subjective and psychological well-being vary according to differences in number of chronic health conditions and age.

Researchers have distinguished between the higher-order constructs of subjective well-being and psychological well-being (Linley, Maltby, Wood, Osborne, & Hurling, 2009). Subjective well-being consists of three components—pleasant emotions, unpleasant emotions, and judgments of life satisfaction (Diener, Suh, Lucas, & Smith, 1999). In contrast, psychological well-being has been defined as engagement with the existential challenges of life, such as maintaining a sense of purpose in the face of hardships (Keyes, Shmotkin, & Ryff, 2002). Linley et al. (2009) demonstrated that although they were correlated, indicators of subjective well-being and indicators of psychological well-being load on different factors. The data set that we used to test our hypotheses contained scales assessing two components of subjective well-being (positive affect and negative affect) and one component of psychological well-being (resilience).

THEORETICAL FOUNDATION FOR THE STUDY

Several mediators have been proposed to account for the beneficial effect of volunteering on measures of subjective and psychological well-being including increasing social integration and connectedness, enhancing the meaning of life, coping better with stress due to a greater focus outside of self, fostering competence, and promoting a more active and healthier life style (Midlarsky & Kahana, 1994). In contrast, researchers have paid less attention to identifying moderators of the association between volunteering and measures of subjective and psychological well-being. There are different views regarding who benefits the most from volunteering. In the context of the association between volunteering

and mortality, Oman (2007) formulated two alternative hypotheses regarding moderator variables. The *complementary* hypothesis posits that the benefits of volunteering are more pronounced among individuals with ample psychosocial resources. This hypothesis is based on the notion that individuals with favorable psychosocial resources are best positioned to capitalize from performing volunteer service. In contrast, the *compensatory* hypothesis proposes that the benefits of volunteering are more pronounced among individuals with limited psychosocial resources. This hypothesis is based on the notion that volunteering is a role that enhances psychosocial resources and thus it helps to offset unfavorable life circumstances.

Empirical Foundation for the Study

The Relation between Volunteering and Well-Being

Numerous cross-sectional studies have found a positive relation between volunteering and subjective well-being (Borgonovi, 2008; Bull & Aucoin, 1975; Carp, 1968; Dulin & Hill, 2003; Dye, Goodman, Roth, Bley, & Jensen, 1973; Edwards & Kleemack, 1973; Fengler, 1984; Graney, 1975; Harlow & Cantor, 1996; Herzog, Franks, Markus, & Holmberg, 1998; Hunter & Linn, 1981; McIntosh & Danigelis, 1995; Schwartz, Meisenhelder, Ma, & Reed, 2003; Windsor, Anstey, & Rodgers, 2008). In a meta-analysis of mostly cross-sectional studies, Wheeler, Gorey, and Greenblatt (1998) examined the relation between volunteering and life satisfaction. Based on 29 studies, they found that the average volunteer was located at the 70th percentile in the distribution of life satisfaction scores for non-volunteers. It should be noted that these cross-sectional studies did not address the question of the causal direction of the effects. Therefore, it is noteworthy that several longitudinal studies have provided additional support for the hypothesis that volunteering is positively related to feelings of well-being (Greenfield & Marks, 2007; Hao, 2008; Lum & Lightfoot, 2005; Morrow-Howell, Hinterlong, Rozario, & Tang, 2003; Musick & Wilson, 2003; Piliavin & Siegl, 2007; Van Willigen, 2000).

Moderators of the Relation between Volunteering and Well-Being

A few studies have investigated whether age moderates the association between volunteering and well-being. In an initial study, Van Willigen (2000) used two waves of data from the Americans' Changing Lives data set. She classified participants as "younger" (24-59 years old) and "older" (60 years old and older) and examined the relations between volunteering and life satisfaction. Among older adults, the relation between hours volunteered was linear and positive whereas among young adults volunteering had a beneficial impact on life satisfaction for those who volunteered approximately 70 hours per year or less but it

had an detrimental effect on life satisfaction for those who volunteered more than 140 hours per year.

Musick and Wilson (2003) used three waves of data from the Americans' Changing Lives data set. They classified participants as "younger" (24-64 years old) and "older" (65 years old and older) and examined the association between volunteering at baseline and sustained volunteering on changes in depressive symptoms. They found that older adults benefitted in terms of a reduction in depression symptoms from volunteering at baseline but younger volunteers did not. For both younger and older adults alike, sustained volunteering was associated with a reduction in depressive symptoms. However, the benefits of sustained volunteering were more pronounced in the older, as compared to the younger, age group. Finally, in a third study using three waves of data from the Americans' Changing Lives data set, Morrow-Howell et al. (2003) examined the relations between volunteering and self-rated health, functional limitations, and depressive symptoms among participants 60 years old and older. They found that volunteering had a greater benefit with increased age for functional limitations and depressive symptoms (but not for perceived health).

A handful of studies have examined health as a moderator of the benefits of volunteering. Consistent with the complementary hypothesis, Sabin (1993) found that volunteering lowered the risk of dying during the mortality surveillance period only for participants who were in good health and had no functional limitations. In contrast, the findings of three other studies supported the compensatory perspective. In a longitudinal study, Morrow-Howell et al. (2003) found that the relation between previous functional limitations and subsequent functional limitations was lower among volunteers than non-volunteers. In another longitudinal study, Greenfield and Marks (2007) demonstrated that functional limitations were associated with a decrease in personal growth (an indicator of psychological well-being) only among older adults who were not continuously involved with religious voluntary groups. More recently, in a prospective study, Okun, August, Rook, and Newsom (2010) reported that the difference in the risk of dying during the mortality surveillance period between older adults who volunteered never or almost never and those who volunteered more frequently than never or almost never increased as functional limitations increased.

Opposing Hypotheses Regarding Age and Chronic Health Conditions as Moderators

Aging is accompanied by the loss of roles (Moen, Dempster-McClain, & Williams, 1992) and by a lesser sense of purpose in life (Ryff, 1995). On the one hand, from the perspective of the complementary hypothesis, the decline of psychosocial resources with age suggests that the relation between volunteering and subjective and psychological well-being will be stronger among younger than older adults. However, Van Willigen (2000) posited that in the face of role

losses, volunteering may be an especially meaningful, self-determined role that creates a salient identity for older adults. In contrast, for younger adults, volunteering may be an offshoot of seeking (e.g., finding a job) and performing (parenting) other roles. Thus, on the other hand, from the perspective of the compensatory hypothesis, it can be predicted that the association between volunteering and measures of subjective and psychological well-being will be stronger among older than younger adults.

Chronic health conditions are inversely related to psychosocial resources such as self-esteem (Vilhjalmsson, 1998). Thus, according to the complementary hypothesis, the association between volunteering and measures of subjective and psychological well-being will be stronger as chronic health conditions decrease. In contrast, the compensatory hypothesis makes the alternative prediction that the association between volunteering and measures of subjective and psychological well-being will be stronger as chronic health conditions increase.

The Issue of Control Variables

There are multiple models that can be posited to account for the relations among volunteering, health, age, and well-being and these models are not necessarily mutually exclusive. For example, there may a reciprocal relation between volunteering and well-being such that volunteering promotes well-being (i.e., social causation) and low levels of well-being are a barrier to volunteering (i.e., selection effects) (Morrow-Howell, 2010). In the present study, we assumed that volunteering is an antecedent of subjective and psychological well-being. In light of this assumption, we controlled for several types of variables including socio-demographic characteristics (e.g., education), life style variables (e.g., participation in vigorous exercise), and indicators of social capital (e.g., neighborhood social cohesion) that have been shown to be associated with volunteering, chronic health conditions, age, and measures of subjective and psychological well-being.

METHOD

The Sample

The sample consisted of 4,196 respondents of the 2008 Arizona Health Survey (AHS). A list-assisted random-digit dialing (RDD) approach was used to recruit a sample representative of the adult residential population of Arizona. This approach is the current standard method of choice for telephone surveys (Tucker, Lepkowski, & Piekarski, 2002). Households were randomly selected from comprehensive telephone lists, and residents within households were then randomly selected for participation. Households sampled for the survey excluded group households of more than nine unrelated persons (e.g., communes, convents, or dormitories), institutional facilities (e.g., prisons, nursing homes, residential

treatment facilities), the homeless, and those living in military barracks. People living in residences without landlines were excluded from the sample.

In list-assisted sampling, a random sample of telephone numbers is drawn from sets of 100 telephone numbers that cover the geographical region. Each set contains 100 telephone numbers with the same first eight digits, with the last two digits ranging from 00 to 99. A total of 129,250 telephone numbers were selected. Procedures were implemented to purge out-of-scope telephone numbers, such as nonresidential and nonworking numbers. The remaining 47,392 telephone numbers were contacted for screening interviews. When addresses could be obtained (approximately 58%), prospective participants were sent an advance letter in English and Spanish prior to the initiation of calls. Screening interviewers identified an adult of 18 years or older to serve as household informant, determined whether the phone number was associated with a residence, and ascertained how many adults resided in the household. If more than one adult resided in the household, a sample selection algorithm (Rizzo, Brick, & Park, 2004) was used that was designed to ensure an equal probability of being selected for each adult based on the number of adults in the household. A more detailed account of AHS design and methodology is available for download online (AHS, 2008).

Measures

We assessed two aspects of subjective well-being (positive affect and negative affect) and one aspect of psychological well-being (resilience).

Positive Affect

Positive affect was measured with the five-item World Health Organization's Well-Being Index (WHO-5) (Bech, 2004). Using a time frame of 30 days, respondents were asked how often they felt "cheerful and in good spirits," "active and vigorous," "calm and relaxed," "awakened feeling fresh and rested," and "daily life was full of things that interest you." Respondents rated the items on a 5-point scale (1 = *all of the time*, 5 = *none of the time*). After recoding each item, item mean scores were created. Higher scores indicate greater positive affect. The actual and potential minimum and maximum values were 1 and 5, respectively. By and large, participants experienced moderately high levels of positive affect ($M = 3.69$, $SD = 0.69$). The internal consistency reliability for the measure of positive affect, as estimated by coefficient alpha, was .79.

Negative Affect

Negative affect was assessed with six-items from the Kessler Psychological Distress Scale (K10) (Kessler, Andrews, Colpe, Hiripi, Mroczek, Normand, et al., 2002). Using a time frame of 30 days, respondents were asked how often they felt "nervous," "hopeless," "restless or fidgety," "so depressed so that

nothing could cheer you up,” “that everything was an effort,” and “worthless.” Respondents rated the items on a 5-point scale (1 = *all of the time*, 5 = *none of the time*). After recoding each item, item mean scores were created. Higher scores indicate greater negative affect. Whereas the actual and potential minimum value was the same (i.e., 1), the actual and potential maximum values were 4.83 and 5, respectively. Overall, participants reported fairly low levels of negative affect ($M = 1.57$, $SD = 0.60$). The internal consistency reliability for the measure of negative affect, as estimated by coefficient alpha, was .80.

Resilience

Resilience was measured with an abbreviated version of the Connor-Davidson Resilience Scale (CD-RISC) (Connor & Davidson, 2003). Using a time frame of 30 days, participants responded to six statements pertaining to:

1. adapting when changes occur;
2. bouncing back after illness, injury, or other hardships;
3. achieving goals in the face of obstacles;
4. strength in dealing with life's challenges;
5. having a strong sense of purpose; and
6. feeling in control of one's life.

Respondents rated the items on a 5-point scale (1 = *all of the time*, 5 = *none of the time*). After recoding each item, item mean scores were created. Higher scores indicate greater resilience. The potential and actual minimum and maximum values were 1 and 5, respectively. In general, participants reported that they were very resilient ($M = 4.26$, $SD = 0.61$). The internal consistency reliability for the measure of resilience, as estimated by coefficient alpha, was .82.

Volunteer Status

Respondents were asked, “In the past 12 months have you performed any volunteer services, such as with a church, school, or civic groups, an arts, health, or social service agency, or similar organization?” A dummy variable was created in which participants who did not volunteer during the past year were coded 0 and participants who volunteered during the past year were coded 1. Forty-nine percent of the participants indicated that they had volunteered during the past year.

Number of Chronic Health Conditions

Chronic health conditions refer to diagnosed physical, cognitive, and emotional ailments that are expected to be of lengthy duration or permanent (van der Lee, Mokkink, Grootenhuys, Heymans, & Offringa, 2007). We focused on chronic *physical* conditions that participants were told they had by their

physicians. We reasoned that including chronic emotional health conditions would result in contamination between our measure of chronic health conditions and our measures of subjective and psychological well-being, and that people with severe cognitive problems were unlikely to be able to respond to the survey questions.

Participants were asked whether a doctor had *ever* told them that they had each of the following conditions: asthma, diabetes, high blood pressure, heart disease, arthritis, gout, lupus, or fibromyalgia, and a gastrointestinal, stomach, or digestive disorder. For each chronic health condition, responses of “no” were coded 0 and responses of “yes” were coded 1. The percentages of the sample with each of the six chronic conditions were as follows: asthma (15%), diabetes (11%), hypertension (37%), heart disease (16%), arthritis, gout or fibromyalgia (34%), and a gastrointestinal, stomach, or digestive disorder (20%). A (lifetime) number of chronic health conditions score was created by summing across the six binary variables, with possible values ranging from 0 to 6. The mean number of chronic health conditions was 1.33 ($SD = 1.27$).

Age

Participants were asked, “What is your age, please?” The age of the participants ranged from 18 to 96 years old with a mean of 56.45 years old ($SD = 17.43$).

Control Variables

Sociodemographic control variables included gender, ethnicity/race, and educational attainment. Participants were asked, “Are you male or female?” Male respondents were assigned a code of 0 and female respondents were assigned a code of 1 to represent gender. The majority of the participants were women (63%).

We used survey items to assess Hispanic ethnicity and race. First, respondents were asked to report whether or not they were “Latino or Hispanic.” Fourteen percent of the participants indicated that they were Hispanic. Second, respondents were asked seven “yes/no” questions regarding whether they were: (a) White, (b) African American, (c) Native American or Alaskan Native, (d) Asian, (e) Native Hawaiian, (f) other Pacific Islander, and (g) some other race. The racial composition of the sample was: White (86%), African American (3%), American Indian/Alaskan Native (2%), Asian (1%), Native Hawaiian or Other Pacific Islander (0%), some other race (6%), and two or more races (2%). For the purposes of the current study, only responses to the Hispanic ethnicity item were used as a variable in the main statistical analyses. Non-Hispanics were coded 0 and Hispanics were coded 1.

Educational attainment was assessed by asking respondents “What is the highest grade of education you have completed and received credit for?” Responses were coded into a set of four dummy variables: high school graduate, some college, college graduate, and some graduate course work or above. The reference

group was less than a high school degree. Nine percent of participants did not obtain a high school degree, 28% graduated from high school, 28% had some college education, 19% obtained a college degree, and 16% had done at least some post-baccalaureate course work.

Life style control variables included time spent working and engaging in vigorous exercise. Respondents were asked, "How many hours per week do you *usually* work at *all* jobs or businesses?" Fifty-one percent of the participants were working ($M = 20.80$, $SD = 22.52$). Participants were asked to think about *vigorous* activities they do that take hard physical effort, such as aerobics, running, soccer, fast bicycling, or fast swimming. Then they were asked whether, in a typical week, they do any vigorous physical activities. If respondents answered in the affirmative, they were asked the number of days per week that they typically engage in vigorous exercise. The mean number of days of vigorous exercise per week was 1.27 ($SD = 1.96$).

Social capital control variables included marital status, number of household members, number of family members living nearby, and neighborhood social cohesion. Participants were asked whether they were married or living with a partner, divorced, separated, widowed, or never married. A dummy variable was created in which participants who were not married or living with a partner were coded 0 and participants who were married or living in a marriage-like relationship were coded 1. Fifty-seven percent of the participants were married or living with a partner, 16% were widowed, 16% were divorced or separated, and 11% had never married.

The number of people living in the household was assessed by summing responses to three questions that asked about the number of: (a) children (< 12 years old), (b) adolescents (12-17 years old), and (c) adults in the household including the participant. The mean size of the households was 2.43 people ($SD = 1.58$). The number of family members living nearby was assessed by asking participants, "Not counting the people who live with you, how many other adult family members live within an hour's drive of your home?" The mean number of adult family members living within an hour's drive of the participant's residence was 3.29 ($SD = 6.31$).

Neighborhood social cohesion was assessed using a five-item subscale from the Collective Efficacy Scale (Sampson, Raudenbush, & Earls, 1997). Sample items included "people in this neighborhood can be trusted" and "people in this neighborhood do NOT share the same values." Respondents rated the items on a 4-point scale (1 = *strongly agree*, 4 = *strongly disagree*). After recoding positively worded statements, mean scores across items were created. The sample mean on the neighborhood social cohesion scale of 3.13 ($SD = 0.46$) indicates that, on average, participants were midway between agreeing and strongly agreeing with the positive end of each neighborhood social cohesion item. The internal consistency reliability for the Neighborhood Social Cohesion scale, as estimated by coefficient alpha, was .77.

Procedures

The survey questionnaire was administered by phone interview in English or Spanish. Bilingual data collectors were available to conduct Spanish language survey interviews. The questionnaire included items assessing demographics, physical and mental health, health insurance coverage, health care utilization, employment, income, homeownership, and perceptions of one's neighborhood. Sixteen percent of the households were successfully screened. Of the 7,540 screening interviews, 4,196 (56%) interviews were completed. The refusal rate was 30%, and other non-response accounted for 14%. The resulting cooperation rate (number interviewed divided by sum of number interviewed and number of refusals) was 65%. Thirty-five interviews were conducted with proxies. Because these interviews were missing data on the majority of the study variables, we questioned the quality of data collected by proxy and excluded them from our analyses.

Comparison of Sample with State-Level Data

Table 1 compares AHS sample demographic statistics with state-level data from the American Community Survey (ACS) 1-year estimates for 2008 (U.S. Census Bureau, 2008). There were several noteworthy differences between the AHS statistics and the ACS data. The percentage of females was much higher in the AHS (63%) than state-wide in Arizona (50%).

There were substantial differences in the age distribution of the AHS sample and the state-wide data. For example, only 7% of the participants in the AHS survey were less than 30 years old whereas 23% of the state-wide population was less than 30 years old. The percentage of Hispanics in the AHS sample (14%) was much lower than the percentage of the state's Hispanic population (30%). With respect to race, Whites appear to have been over-represented in the AHS (86%) relative to the state-wide population (80%). The percentage of high school graduates was 7 percentage points higher in the AHS sample (91%) than in the state's population (84%), whereas the percentage employed was eight percentage points higher in the state's population (59%) than in the AHS sample (51%). In light of the biases associated with the AHS sample, we employed weighting methodology in our inferential analyses.

Weighting

Weighting procedures were developed for AHS in order to account for sample bias (AHS, 2008). The purpose of the weighting procedure was to compensate for differential probabilities of selection for households and persons, to reduce bias due to non-respondents having different characteristics than respondents, to adjust for under-coverage, and to reduce variance of estimates by using auxiliary information. A classical design-based approach was used, where base weights

Table 1. Comparison of AHS Sample to State Characteristics

Variable	AHS (%)	State (%) ^a
Gender		
Male	37%	50%
Female	63%	50%
Ethnicity		
Hispanic or Latino	14%	30%
Non-Hispanic or Latino	86%	70%
Race		
White	86%	80%
African American	3%	4%
Native American or Alaska Native	2%	4%
Asian	1%	2%
Native Hawaiian or other Pacific Islander	0%	0%
Some other race	6%	7%
Two or more races	2%	3%
Age		
18-29 years old	7%	23%
30-39 years old	12%	19%
40-49 years old	16%	18%
50-59 years old	20%	15%
60-69 years old	19%	12%
70-79 years old	16%	8%
80+ years old	10%	5%
Education		
High school graduate or higher	91%	84% ^b
Employment		
Employed	51%	59% ^c

^aState percentages refer to percentage of total population, unless otherwise specified. In contrast, the AHS sample includes only the adult residential population of Arizona, age 18 and over.

^bPercentage of population age 25 years and over.

^cPercentage of population age 16 years and over in the civilian labor force.

were constructed from the inverse of the probabilities of selection for each household. Base weights were then corrected using sub-sampling factor adjustments to account for unequal probabilities of selection resulting from differences in sampling rates due to sampling and recruitment procedures, such as refusal conversion sub-sampling, and stratification by telephone numbers with and without mailing addresses.

Next, person weights were calculated for each respondent, taking into consideration household weighting. Weights were further adjusted using raked weights. Raking factors were used to compute weights that would adjust the survey sample to population totals balanced on important demographic characteristics (AHS, 2008). In this procedure, initial person weights were raked to known control totals. Control totals were identified using population estimates according to the Arizona Department of Commerce Population estimates and the American Community Survey estimates for Arizona (Arizona Department of Commerce, 2006; U.S. Census Bureau, 2008). The six raking dimensions were created by combining demographic variables of age, sex, race, and ethnicity, and geographic areas (Maricopa County and the remainder of the state). These variables are correlated with characteristics of households without a landline telephone, such as household tenure and education level.

RESULTS

Correlations among the Study Variables

Table 2 presents the correlations among the study variables. The maximum amount of variance shared by the measures of subjective and psychological well-being was 35%, indicating that the three measures of well-being were not equivalent to each other. Similarly, the relations between volunteer status and the measures of subjective and psychological well-being were modest in magnitude, with the absolute values of the correlations ranging from .11 to .15. Number of chronic health conditions was positively correlated with negative affect scores ($r = .09$) and inversely related to both positive affect ($r = -.15$) and resilience ($r = -.12$) scores. Age was positively correlated with positive affect ($r = .09$) and resilience ($r = .06$), and inversely related to negative affect ($r = -.17$) scores. As expected, age was positively correlated with number of chronic health conditions ($r = .46$). Age ($r = .01$) and number of chronic health conditions ($r = -.05$) were weakly related to volunteering.

Among the control variables, neighborhood social cohesion exhibited the strongest association with the well-being measures (the absolute values of the correlations ranged from .17 to .21). The strongest correlate of age was household size ($r = -.51$) and the strongest correlate of number of chronic health conditions was hours working per week ($r = -.25$). Among the control variables, neighborhood social cohesion ($r = .17$) exhibited the strongest associations with volunteer status.

Tests of Moderator Variables

We tested for moderation using multiple regression. To account for complex sample weights and partial missingness in the data, we used *Mplus* (Muthén & Muthén, 1998-2006). Partial missingness in the context of our analyses refers to missing values on any of the predictor variables. None of the cases had missing values on the dependent variables, so all 4,161 of the cases were included. Full-information maximum likelihood with robust standard errors was used for estimation. For each of the three dependent variables (negative affect, positive affect, and resilience), separate multiple regression analyses were carried out. In these models, we centered age and chronic health conditions. This was accomplished for each variable by subtracting the mean from each score. Centering does not affect tests of interaction effects but aids in the interpretation of main effects in the context of interaction effects (Aiken & West, 1991). In these models, we included the main effects of the covariates, volunteer status, centered age, centered chronic health conditions, and the volunteer status by centered age and volunteer status by centered chronic health conditions interaction effects. In the absence of any significant ($p < .05$) interaction effects, we present a trimmed model containing only main effects.

Table 3 summarizes the results of the regression analyses. Asterisks indicate whether a coefficient was significantly different than 0 at the .05 level. The volunteer status by chronic health conditions interaction term was statistically significant ($p < .05$) in the models predicting positive affect and resilience scores, but was not statistically significant ($p > .05$) in the model predicting negative affect. The volunteer status by age interaction term was not significant ($p > .05$) in any of the models. The R^2 for the trimmed model predicting negative affect scores was .13 whereas the R^2 for predicting positive affect scores and resilience scores was .14 in both models. The volunteer status by chronic health conditions interaction effect uniquely increased the R^2 in the models predicting both positive affect and resilience by .003.

In the model with positive affect scores as the dependent variable, the unstandardized coefficient for the interaction between volunteering and health was .07. A simple slopes plot of this interaction effect using values of 0, 1, and 2 chronic health conditions ($M = 1.05$, $SD = 1.18$) indicates that the relation between volunteering and positive affect scores tends to increase as the number of chronic conditions increases (see Figure 1).

Similarly, the unstandardized coefficient for the interaction between volunteering and number of chronic conditions in the model with resilience scores as the dependent variable was .07. A simple slopes plot of this interaction effect indicates that the relation between volunteering and resilience scores tends to increase as the number of chronic conditions increases (see Figure 2).

Table 2. Correlation Coefficients among the Study Variables

Variable	1	2	3	4	5	6	7
1. Negative affect	1						
2. Positive affect	-.59**	1					
3. Resilience	-.56**	.59**	1				
4. Organizational volunteering	-.14**	.11**	.15**	1			
5. Count of chronic health conditions	.09**	-.15**	-.12**	-.05**	1		
6. Age	-.17**	.09**	.06**	.01	.46**	1	
7. Female	.07**	-.07**	-.10**	.02	.09**	.05**	1
8. Hispanic	.07**	.09**	-.02	-.15**	-.11**	-.22**	-.03*
9. Graduated high school and some trade school	.06**	-.04**	-.04*	-.13**	.02	-.03	.02
10. Some college	0	-.04*	0	.03*	.07**	.03*	.03*
11. College degree	-.10**	.03	.08**	.14**	-.02	.04**	-.01
12. Beyond a college degree	-.13**	.05**	.12**	.16**	-.03*	.11**	-.03*
13. Hours working per week	-.07**	.06**	.17**	.06**	-.25**	-.35**	-.26**
14. Vigorous exercise days per week	-.04**	.16**	.12**	.11**	-.19**	-.20	-.15**
15. Married or living with partner	-.13	.07	.12	.09	.01	.10**	-.04**
16. Number of people in household	.10	.01	-.04	-.04	-.23**	-.51**	-.04**
17. Number or nearby family members	.04	-.03	.05	.03	.01	-.14**	-.02
18. Neighborhood cohesion scale	-.21	.17	.20	.17	.01	.20**	.04*

	8	9	10	11	12	13	14	15	16	17
1										
.02	1									
-.13**	-.37**	1								
-.14**	-.29**	-.24**	1							
-.16**	-.26**	-.21**	-.17**	1						
.04**	-.07**	.01	.07**	.10**	1					
-.03*	-.07**	0	.01	.07**	.16**	1				
-.01	-.05**	-.01	.07**	.09**	.10**	-.05**	1			
.29**	.07**	-.10**	-.10**	-.12**	.12**	.05**	.10**	1		
-.03*	.02	.03	.02	-.08**	.07**	.05**	.01	.07**	1	
-.21**	-.12**	.04**	.10**	.15**	-.01	.06**	.10**	-.16**	-.01	1

Note: N's based on pairwise deletion range from 3,803 to 4,161.
 *Correlation significant at the .05 level (2-tailed).
 **Correlation significant at the .01 level (2-tailed).

Table 3. Unstandardized Regression Coefficients and Standard Errors for the Multiple Regression Models

Predictor	Positive affect		Resilience		Negative affect	
	b	SE	b	SE	b	SE
Female	-.03	.03	-.07*	.03	.06*	.03
Hispanic	.26*	.05	.14*	.04	-.07	.04
High school degree	.00	.06	.20*	.06	-.14*	.06
Some college	-.02	.06	.20*	.06	-.16*	.06
College degree	.02	.06	.25*	.06	-.24*	.05
Graduate studies	-.01	.06	.29*	.06	-.25*	.05
Hours working	.00*	.00	.00*	.00	-.00*	.00
Vigorous exercise	.05*	.01	.03*	.01	-.01	.01
Marital status	.04	.04	.08*	.04	-.09*	.03
Household size	.02	.01	.01	.01	.00	.01
Family members nearby	.00	.00	.01*	.00	.00	.00
Neighborhood social cohesion	.20*	.04	.20*	.04	-.17	.04
Volunteering	.07	.09	.16	.10	-.10*	.03
Number of chronic health conditions	-.15*	.02	-.10*	.02	.09*	.01
Age	.01*	.00	.01*	.00	-.01*	.00
Volunteering*Number of chronic health conditions	.07*	.03	.07*	.02	—	—
Volunteering*Age	.00	.00	.00	.00	—	—

*Statistically significant at the .05 level.

DISCUSSION

Grimm, Spring, and Dietz (2007, p. 13) concluded from their review of the literature that, "When individuals volunteer, they not only help their community but also experience better health in later years, whether in terms of greater longevity, higher functional ability, or lower rates of depression." This conclusion ignores the possibility that there are individual differences in who benefits the most from volunteering. The present study tested the hypotheses that number of chronic health conditions and age moderate the association between volunteering and subjective and psychological well-being.

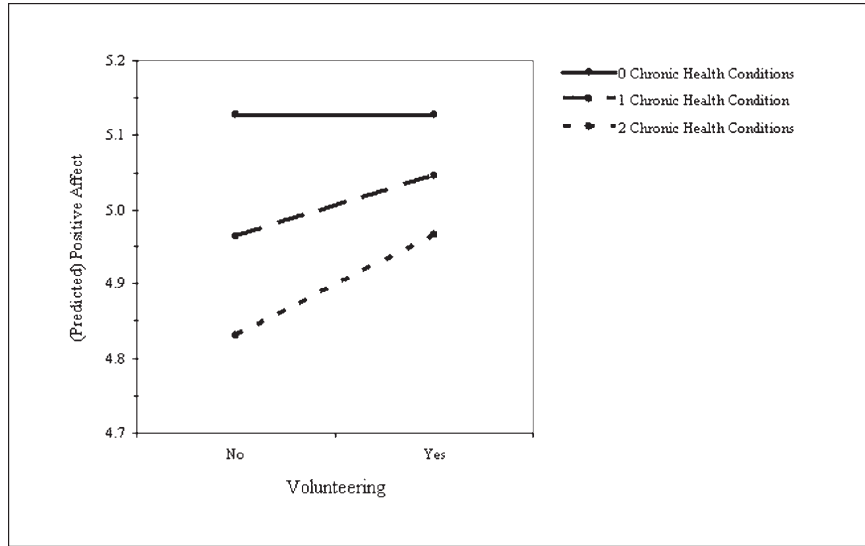


Figure 1. Simple slopes for predicted positive affect scores.
 Note that the values of the non-displayed predictors were set to the mean for quantitative variables and the mode for categorical variables.

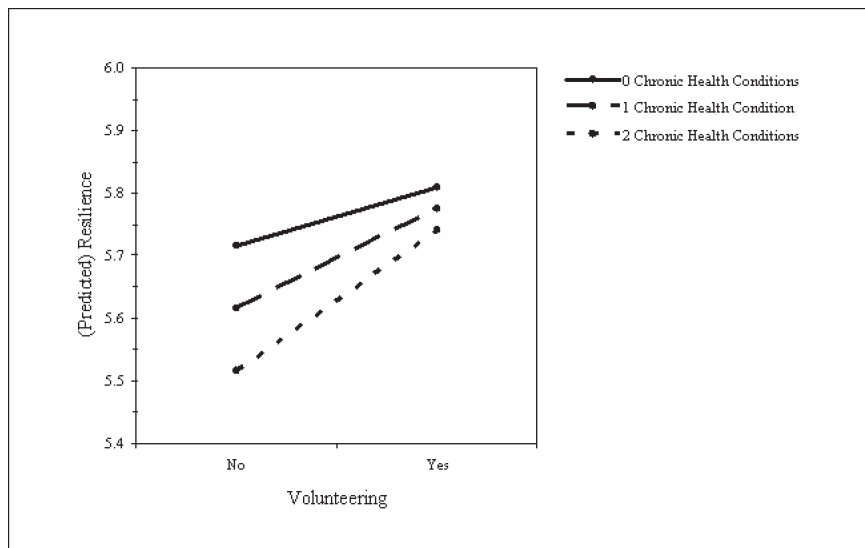


Figure 2. Simple slopes for predicted resilience scores.
 Note that the values of the non-displayed predictors were set to the mean for quantitative variables and the mode for categorical variables.

The notion that the benefits of volunteering are more pronounced for individuals with greater psychosocial resources is referred to as the complementary hypothesis and the notion that volunteering is more beneficial for individuals with diminished psychosocial resources is labeled the compensatory hypothesis (Oman, 2007). Consistent with the compensatory hypothesis, we demonstrated that as the number of chronic health conditions increased, the relations between volunteering and (a) positive affect scores, and (b) resilience scores increased. Although Sabin (1993) did not find support for the compensatory hypothesis, several other researchers have shown that the benefit of volunteering increases as health (Greenfield & Marks, 2007; Okun et al., 2010) and other personal resources (Fengler, 1984; Greenfield & Marks, 2004) decrease.

Adults with chronic health conditions tend to have lower self-esteem (Vilhjalmsson, 1998), and thus may benefit the most from volunteering with respect to well-being. Volunteering may have a particularly viable role for boosting self-esteem because it has been linked to perceptions that other people feel that one is useful (Gruenewald, Karlmangla, Greendale, Singer, & Seeman, 2007). Furthermore, in an experimental field study, Midlarsky and Kahana (1994) demonstrated that, relative to a control group, older adults who were given individually tailored persuasive communications about the benefits of volunteering were more likely to volunteer and had higher self-esteem. Self-esteem, in turn, is strongly related to feelings of well-being (DeNeve & Cooper, 1998).

It is important to note that the mechanism underlying the joint effect of volunteering and number of chronic health conditions on positive affect and resilience could reflect other dimensions of the self such as sense of belonging (Midlarsky & Kahana, 1994), sense of mattering (Piliavin & Siegl, 2007), and agentic self-concept (Herzog et al., 1998). Studies of adults with and without chronic health conditions in which volunteering is manipulated and measures of various dimensions of the self as well as measures of subjective and psychological well-being are administered post-treatment could shed light on the dynamics underlying the joint effects of volunteering and health.

Consistent with other studies, the volunteering by health interaction effect was not observed across all of the well-being measures (Greenfield & Marks, 2004, 2007). Although more research is needed, the joint effect of volunteering and personal resources appears to be strongest for measures of psychological well-being and weakest for measures of negative affect. This configuration of findings suggests that volunteering may buffer the effects of losses in the health domain and in other domains by engendering a positive reframing that what one does matters (Piliavin & Siegl, 2007).

We did not find any evidence that the relation between volunteering and well-being varied with age. One possible explanation for our failure to detect an interaction between volunteer status and age has to do with the measure of volunteering used in the AHS. Instead of assessing frequency of volunteering

or hours volunteered, in the AHS, participants were simply asked whether they had volunteered during the past year. In Van Willigen's (2000) study, she did not find a volunteering by age interaction on life satisfaction when she used a dichotomous measure of volunteering (non-volunteer versus volunteer). Instead, she found that age moderated the relation between hours volunteered and life satisfaction. Therefore, the yes/no measure of volunteering used in the AHS may have been too crude to detect the moderating influence of age on the association between volunteering and our measures of subjective and psychological well-being. Another possibility is that previous research on the joint effect of volunteering and age on measures of well-being which used earlier birth cohorts does not generalize over historical time to more recent birth cohorts.

Limitations

The current study had several limitations. First, because we employed a cross-sectional, non-experimental design, we cannot address the question of the causal relations among volunteering, health, and subjective and psychological well-being. For example, from the perspective of a selection effect model, resilience may foster volunteering and this effect may be particularly strong among adults with chronic health conditions.

Second, the scales available in the AHS to serve as indicators of subjective and psychological well-being have not been used by other researchers studying moderators of the association between volunteering and well-being. Future research could address this limitation by including the scales used in the AHS as well as more mainstream measures of subjective (Diener et al., 1999) and psychological (Ryff, 1995) well-being. Third, the AHS included only one yes-no question about volunteering. When other measures, such as hours volunteered are employed, researchers can determine whether the linear and quadratic relations between volunteering and measures of subjective and psychological well-being vary by number of chronic health conditions (Windsor et al., 2008).

Fourth, because functional limitations were not assessed in the AHS, we were unable to examine whether the moderating effect of health on the relation between volunteering and well-being was greater for measures that tap into functional limitations as opposed to number of chronic health conditions (Okun et al., 2010). Finally, we accounted for only a modest amount of the variance in our dependent variables and the effect sizes associated with our significant interaction effects were very small (i.e., the unique R^2 values were less than 1%). One possibility is that the interaction between chronic health conditions and volunteering varies with contextual variables such as type of volunteer work, motivation to volunteer, and the salience of the volunteer role.

Public Policy Implications

With the baby boomers reaching retirement age, there is growing interest in tapping into their reservoir of talent by recruiting them to serve as volunteers

(Gottlieb & Gillespie, 2008). In 2009, legislation was passed designed to substantially increase the opportunities for volunteering afforded to older adults (Corporation for National & Community Service, 2010). We have shown in an age heterogeneous sample that the difference in positive affect and resilience scores between volunteers and non-volunteers is more pronounced for people with many, as opposed to few, chronic health conditions. However, individuals with health problems are less likely to volunteer (Li & Ferraro, 2005). Thus, somewhat paradoxically, those who may benefit the most from volunteering in terms of their well-being are least likely to do so.

Physicians are powerful social influence agents with respect to changing the health behavior of their patients (O'Connor, Rush, Prochaska, Pronk, & Boyle, 2001). Building on this finding and the knowledge that personal appeals are an effective approach to recruiting volunteers (Smith, 1994), Hirschfelder and Reilly (2007) described a pilot project in California in which patients recruited from the Medicare practice of a large HMO receive a volunteerism "prescription" and information about opportunities to volunteer. The findings from the current study suggest that such programs could be used to fortify the emotional well-being of adults with chronic health conditions as well as to address important social issues.

REFERENCES

- Aiken, L. S., & West, S. G. (1991). *Testing and interpreting interactions*. Newbury Park, CA: Sage.
- Arizona Department of Commerce. (2006). *Commerce population estimates and projections*. Accessed from <http://www.azcommerce.com/EconInfo/Demographics>
- Arizona Health Survey (AHS). (2008). *Design and methodology of the Arizona Health Survey*. Phoenix, AZ: St. Luke's Health Initiatives.
- Bech, P. (2004). Measuring the dimensions of psychological general well-being by the WHO-5. *QoL Newsletter*, 32, 15-16.
- Borgonovi, F. (2008). Doing well by doing good: The relationship between formal volunteering and self-reported and happiness. *Social Science & Medicine*, 66, 2321-2334.
- Bull, N. C., & Aucoin, J. B. (1975). Voluntary association participation and life satisfaction: A replication note. *Journal of Gerontology*, 30, 73-76.
- Carp, F. M. (1968). Differences among older workers, volunteers, and persons who are neither. *Journal of Gerontology*, 23, 497-501.
- Connor, K. M., & Davidson, J. R. T. (2003). Development of a new resilience scale: The Connor-Davidson Resilience Scale (CD-RISC). *Depression and Anxiety*, 18, 76-82.
- Corporation for National & Community Service. (2010, April). *Edward M. Kennedy Serve American Act one year later*. Retrieved on June 21, 2010 from http://www.national-service.gov/pdf/10_0421_saa_implementation.pdf
- DeNeve, K. M., & Cooper, H. (1998). The happy personality: A meta-analysis of 137 personality traits and subjective well-being. *Psychological Bulletin*, 124, 197-229.
- Diener, E., Suh, E. M., Lucas, R. E., & Smith, H. L. (1999). Subjective well-being: Three decades of progress. *Psychological Bulletin*, 125, 276-301.

- Dulin, P., & Hill, R. (2003). Relationships between altruistic activity and positive and negative affect among low-income older adults service providers. *Aging & Mental Health, 7*, 294-299.
- Dye, D., Goodman, M., Roth, M., Bley, N., & Jensen, K. (1973). The older adults volunteer compared to the nonvolunteer. *The Gerontologist, 13*, 215-218.
- Edwards, J. N., & Kleemack, D. L. (1973). Correlates of life satisfaction: A re-examination. *Journal of Gerontology, 28*, 497-502.
- Fengler, A. P. (1984). Life satisfaction of subpopulations of elderly. *Research on Aging, 6*, 189-212.
- Gottlieb, B., & Gillespie, A. A. (2008). Volunteerism, health, and civic engagement among older adults. *Canadian Journal on Aging, 27*, 399-406.
- Graney, M. J. (1975). Happiness and social participation in aging. *Journal of Gerontology, 30*, 701-706.
- Greenfield, E. A., & Marks, N. F. (2007). Continuous participation in voluntary groups as a protective factor for the psychological well-being of adults who develop functional limitations: Evidence from the National Survey of Families and Households. *Journal of Gerontology: Social Sciences, 62B*(1), S60-S68.
- Greenfield, E. A., & Marks, N. F. (2004). Formal volunteering as a protective factor for older adults' psychological well-being. *Journal of Gerontology: Social Sciences, 59B* (5), S258-S264.
- Grimm, R., Spring, K., & Dietz, N. (2007). *The health benefits of volunteering: A review of recent research*. New York: Corporation for National & Community Service.
- Gruenewald, T. L., Karlmangla, A. S., Greendale, G. A., Singer, B. H., & Seeman, T. E. (2007). Feelings of usefulness to others, disability, and mortality in older adults: The MacArthur Study of Successful Aging. *Journal of Gerontology: Psychological Sciences, 62B*(1), P28-P37.
- Hao, Y. (2008). Productive activities and psychological well-being among older adults. *Journal of Gerontology: Social Sciences, 63B*, S64-S72.
- Harlow, R., & Cantor, N. (1996). Still participating after all these years: A study of life task participation in later life. *Journal of Personality and Social Psychology, 71*, 1235-1249.
- Herzog, A. R., Franks, M. M., Markus, H. R., & Holmberg, D. (1998). Activities and well-being in older age: Effects of self-concept and educational attainment. *Psychology and Aging, 13*, 179-185.
- Hirschfelder, M. A., & Reilly, S. L. (2007). Rx: Volunteer a prescription for healthy aging. In S. G. Post (Ed.), *Altruism and health: Perspective from empirical research* (pp. 116-140). New York: Oxford University Press.
- Hunter, K. I., & Linn, M. W. (1981). Psychosocial differences between elderly volunteers and non-volunteers. *International Journal of Aging and Human Development, 12*, 205-213.
- Kessler, R. C., Andrews, G., Colpe, L. J., Hiripi, E. K., Mroczek, D. K., Normand, S.-L. T., et al. (2002). Short screening scales to monitor population prevalences and trends in non-specific psychological distress. *Psychological Medicine, 32*, 959-976.
- Keyes, C. L. M., Shmotkin, D., & Ryff, C. D. (2002). Optimizing well-being: The empirical encounter of two traditions. *Journal of Personality and Social Psychology, 82*, 1007-1022.

- Li, Y., & Ferraro, K. F. (2005). Volunteering and depression in later life: Social benefit or selection processes? *Journal of Health and Social Behavior*, *46*, 68-84.
- Linley, P. A., Maltby, J., Wood, A. M., Osborne, G., & Hurling, R. (2009). Measuring happiness: The higher order factor structure of subjective and psychological well-being measures. *Personality and Individual Differences*, *47*, 878-884.
- Lum, T. Y., & Lightfoot, E. (2005). The effects of volunteering on the physical and mental health of older people. *Research on Aging*, *27*, 31-55.
- McIntosh, B. R., & Danigelis, N. L. (1995). Race, gender, and the relevance of productive aging for elders' affect. *Journal of Gerontology: Social Sciences*, *50B*, S229-S239.
- Midlarsky, E., & Kahana, E. (1994). *Altruism in later life*. Thousand Oaks, CA: Sage.
- Moen, P., Dempster-McClain, D., & Williams, R. (1992). Successful aging: A life-course perspective on women's multiple roles and health. *American Journal of Sociology*, *97*, 1612-1638.
- Morrow-Howell, N. (2010). Volunteering in later life: Research frontiers. *Journal of Gerontology: Social Sciences*, *65B*, 461-469.
- Morrow-Howell, N., Hinterlong, J., Rozario, P. A., & Tang, F. (2003). Effects of volunteering on the well-being of older adults. *Journals of Gerontology. Series B: Psychological Sciences and Social Sciences*, *58B*, S137-S145.
- Musick, M. A., & Wilson, J. (2003). Volunteering and depression: The role of psychological and social resources in different age groups. *Social Science & Medicine*, *56*, 259-269.
- Muthén, L. K., & Muthén, B. O. (1998-2006). *Mplus user's guide* (4th ed.). Los Angeles, CA: Muthén & Muthén.
- O'Connor, P. J., Rush, W. A., Prochaska, J. O., Pronk, N. P., & Boyle, R. G. (2001). Professional advice and readiness to change behavioral risk factors among members of a managed care organization? *American Journal of Managed Care*, *7*, 125-130.
- Okun, M. A., August, K. J., Rook, K. S., & Newsom, J. T. (2010). Does volunteering moderate the relation between functional limitations and mortality? *Social Science & Medicine*, *71*, 1662-1668.
- Oman, D. (2007). Does volunteering foster physical health and longevity? In S. G. Post (Ed.), *Altruism and health: Perspectives from empirical research* (pp. 15-32). New York: Oxford University Press.
- Piliavin, J. A., & Siegl, E. (2007). Health benefits of volunteering in the Wisconsin Longitudinal Study. *Journal of Health and Social Behavior*, *48*, 450-464.
- Rizzo, L., Brick, J. M., & Park, I. (2004). A minimally intrusive method for sampling persons in Random Digit Dialing surveys. *Public Opinion Quarterly*, *68*, 267-274.
- Ryff, C. D. (1995). Psychological well-being in adult life. *Current Directions in Psychological Science*, *4*, 99-104.
- Sabin, E. P. (1993). Social relationships and mortality among the elderly. *Journal of Applied Gerontology*, *12*, 44-60.
- Sampson, R. J., Raudenbush, S. W., & Earls, F. (1997). Neighborhoods and violent crime: A multilevel study of collective efficacy. *Science*, *277*, 918-924.
- Schwartz, C., Meisenhelder, J. B., Ma, Y., & Reed, G. (2003). Altruistic social interest behaviors are associated with better mental health. *Psychosomatic Medicine*, *65*, 778-785.
- Smith, D. H. (1994). Determinants of voluntary association participation and volunteering: A literature review. *Nonprofit and Voluntary Sector Quarterly*, *23*, 243-263.

- Tucker, C., Lepkowski, J., & Piekarski, L. (2002). The current efficiency of list-assisted telephone sampling designs. *Public Opinion Quarterly*, *66*, 321-338.
- U.S. Census Bureau. (2008). *American Community Survey*. Accessed from <http://factfinder.census.gov>
- U.S. Department of Labor. (2009, January). *Volunteering in the United States, 2008*. Retrieved June 6, 2009, from <http://www.bls.gov/news.release/pdf/volun.pdf>
- van der Lee, J. H., Mookink, L. B., Grootenhuis, M. A., Heymans, H. S., & Offringa, M. (2007). Definitions and measurement of chronic health conditions in children. *Journal of American Medical Association*, *297*, 2741-2751.
- Van Willigen, M. (2000). Differential benefits of volunteering across the life course. *Journals of Gerontology, Series B: Social Sciences*, *55*, S308-S318.
- Vilhjalmsson, R. (1998). Direct and indirect effects of chronic physical conditions on depression: A preliminary investigation. *Social Sciences & Medicine*, *47*, 603-611.
- Wheeler, J. A., Gorey, K. M., & Greenblatt, B. (1998). The beneficial effects of volunteering of older volunteers and the people they serve: A meta-analysis. *International Journal of Aging and Human Development*, *47*, 69-79.
- Windsor, T. D., Anstey, K. J., & Rodgers, B. (2008). Volunteering and psychological well-being among young-old adults: How much is too much? *The Gerontologist*, *48*, 59-70.

Direct reprint requests to:

Morris A. Okun
Department of Psychology
Arizona State University
Tempe, AZ 85287-1104
e-mail: Okun@asu.edu