



## Which types of giving are associated with reduced mortality risk among older adults?



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### ABSTRACT

This study examined how different giving behaviors and prosocial traits earlier in life were related to later mortality risk among older adults, using the Wisconsin Longitudinal Study that has followed a randomly selected sample of U.S. high school graduates since 1957. Cox proportional hazards analyses were used to examine the unadjusted and adjusted associations between the giving-related variables at baseline and survival time during follow-up, controlling for a number of covariates ( $N = 3544$ ). Giving behaviors included giving money to known others, charitable donations, giving support to friends, volunteering, and non-spousal caregiving. Prosocial traits were measured by how caring and friendly/warm the participants were in a typical week. Time-giving behaviors (i.e. caregiving, volunteering, giving support) and prosocial traits were associated with a lower mortality risk in older adults, but giving money was not. This study extends the literature by simultaneously examining a broad range of giving manifestations, which may help researchers to understand reasons for any differences in health benefits among different forms of giving. The results demonstrate that there is more than one prosocial path to longevity in later life and suggest more thoughtful and committed ways to engage in giving.

“You give but little when you give of your possessions. It is when you give of yourself that you truly give.”

— Kahlil Gibran, The Prophet

### 1. Introduction

Both prosocial behaviors and traits contribute to a multifaceted understanding of the health benefits of giving. Prosocial behaviors are defined as those that are intended to help others (Batson & Powell, 2003), and include various giving activities, such as volunteering, donating money, supporting friends, and caregiving for loved ones. Many studies have found a positive association between giving behaviors and health and well-being for givers (e.g. Brown et al., 2009; Brown, Nesse, Vinokur, & Smith, 2003; Dunn, Aknin, & Norton, 2014; Harris & Thoresen, 2005). Prosocial traits, such as empathy, compassion, or other-oriented concerns, are key motivators of prosocial behaviors (Konrath & Grynberg, 2013; Oveis, Horberg, & Keltner, 2010), including everyday behaviors like expressing warmth to others

(Eisenberg & Miller, 1987) that might not be captured in measures of donating, volunteering, or caregiving. Unlike those more discrete prosocial behaviors, traits are less dependent on one's personal and social resources and are thus more likely to remain stable even in old age (Grühn, Rebucal, Diehl, Lumley, & Labouvie-Vief, 2008). Therefore, it is meaningful to consider the health implications of prosocial traits separately from those of prosocial behaviors, particularly among the elderly. Prior research has found that prosocial traits are also associated with positive physical and psychological outcomes (e.g., Ho, Konrath, Brown, & Swain, 2014; Kahana, Bhatta, Lovegreen, Kahana, & Midlarsky, 2013).

However, very few papers have examined the health associations of different giving behaviors and traits *simultaneously* within a single study. People often engage in more than one giving act. Does volunteering, for example, still significantly predict health outcomes when other giving behaviors are controlled for? Is it better or worse for one's health to volunteer for nonprofits, compared with giving money to family or charities, supporting friends, or caregiving for loved ones? Is

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simply seeing oneself as a giving person associated with better health outcomes? When considering next steps for research, or when designing low-cost interventions to improve the health of older adults, it would be helpful to know which prosocial activities are most influential.

Understanding if there are any differences in various forms of giving could also help unpack potential explanations for why giving should have any health benefit at all. One possible mechanism for the effects of giving on health is that the self-regulatory processes required to engage in giving buffer against the effects of one's own stressful experiences. Certain giving situations, such as volunteering, caregiving, or donating large amounts of money relative to one's own wealth require non-trivial amounts of resources and therefore raise self-focused concerns about the cost of engaging in these activities. People act on their desire to give to others in these ways likely must disengage from their self-focused concerns (Poulin, 2017), and in so doing, may also buffer themselves against the known effects of stress on health (Baum & Singer, 1987; Thoits, 2010). Prior work suggests that giving to others buffers the effects of stress on health and well-being (Inagaki & Eisenberger, 2016; Poulin, Brown, Dillard, & Smith, 2013; Raposa, Laws, & Ansell, 2016), and it could be that this stress-buffering effect is due to disengagement from self-focused concerns, driven by a commitment to giving to others. If so, however, some types of giving—especially those that are more sustained or costly—may be more beneficial than others.

To our knowledge, there are only two studies that have examined more than one giving manifestation simultaneously. One study examined both volunteering and charitable donations (Choi & Kim, 2011). They found that moderate volunteering (up to 10 h monthly) and any amount of charitable donations were associated with greater psychological well-being among older adults nine years later, and the effect of donations was larger than that of volunteering. The other study examined the effects of both prosocial behaviors (i.e. volunteering, informal helping) and altruistic attitudes (Kahana et al., 2013). They found that prosocial behaviors were associated with greater life satisfaction, and that both prosocial behaviors and attitudes predicted greater positive affect among older adults three years later. Neither of these studies focused on mortality. The current study extends this literature by simultaneously examining the associations of six giving manifestations on later mortality risk among older adults.

## 2. Method

### 2.1. Participants

We used data from the Wisconsin Longitudinal Study (WLS), which has followed a random sample of 10,317 Wisconsin high school graduates from 1957 to 2011 (six waves). A previous investigation (Konrath, Fuhrel-Forbis, Lou, & Brown, 2012) examined the relationship between volunteering and mortality risk using the WLS, but the present research extends that work by including other types of giving, using updated mortality data, and using a different analytical method. The 2004 wave was our baseline survey, when the WLS first included questions about volunteer activities. There were 7265 graduates who completed (or partially completed) interviews in 2004, with a response rate of 73% (excluding 1288 deaths before the survey). Additionally, only respondents in a 79% random sub-sample ( $N = 5665$ ) were asked the questions about volunteering, caregiving, and some covariates. Our final analysis sample included 3544 respondents who answered all questions reported below. At the baseline, the sample had a mean age of 65 (range = 64 to 67) and 53% were female. While detailed race/ethnicity information is not publicly available, by design the WLS is predominantly White, with a very low representation (< 1%) of ethnic minorities (for a review of the WLS: Herd, Carr, & Roan, 2014).

### 2.2. Measures

#### 2.2.1. Mortality status

Year of death data (reported in the WLS Status and Descriptive Variables Module) has been updated until December 2017, representing a maximum follow-up time of 13 years. Survival time was calculated for respondents who died between the 2004 interview and 2017.

#### 2.2.2. Giving-related behaviors and traits

Six giving-related variables were used as predictors. All variables were assessed in 2004. *Giving money to family and friends*. Respondents reported whether they or their spouse had given anyone \$1000 or more in money, property, or assets since 1993 (1 = yes, 0 = no). *Giving money to charity*. Respondents reported if they or their spouse made charitable contributions totaling \$500 of money or property or more during the last year (1 = yes, 0 = no). *Giving support to friends*. Respondents reported four types of support to friends, neighbors, or coworkers during the past month: advice, encouragement, moral or emotional support; transportation, errands or shopping; housework, yard work, repairs or other work around the home; babysitting or child care. Following prior research (e.g. Brown et al., 2003), responses were coded as 1 for giving any type of support and 0 otherwise. *Volunteering*. Respondents reported whether they had done volunteer work in the past 10 years (1 = yes, 0 = no). *Caregiving*. Respondents reported whether they had ever, as well as in the last 12 months, given personal care for a month or more to a family member or friend because of a physical or mental condition, excluding spouse. Note that caregiving to a spouse was not assessed in the 2004 wave of the WLS. To maximize the sample size, responses were coded as 0 for never giving care, 1 for having given care before but not in the past 12 months, and 2 for giving care in the past 12 months (treated as a factor variable in Stata). *Giving-related traits* were assessed via the average of two self-reported traits ( $\alpha = 0.65$ ). Participants were asked to report how caring and friendly/warm they were in a typical week (standardized so 0 = not at all to 1 = a great deal).

#### 2.2.3. Covariates

We included various covariates to account for their potential associations with both giving-related variables and mortality risk, including socio-demographic variables, personality traits, health and health behavior, and social support variables. All covariates were assessed in 2004. See Supplemental Materials for question wording and descriptive statistics.

### 2.3. Analyses

Cox proportional hazards analyses were used to examine the unadjusted and adjusted associations between giving-related variables at baseline and survival time during follow-up. Model 1 included each giving variable separately, Model 2 included all giving-related variables simultaneously, Model 3 adjusted for socio-demographic variables, Model 4 added personality traits variables, Model 5 added health and health behavior variables, and Model 6 added social support variables.

## 3. Results

Prosocial behaviors were prevalent among the sample of older adults. In the baseline survey, 44% reported giving \$1000 or more to family and friends, 64% made charitable donations of \$500 or more, 58% gave support to friends, 59% volunteered, and 33% gave care to someone other than their spouse. Prosocial traits were also salient. On average, respondents rated themselves highly on prosocial traits ( $M = 0.78$  on a scale of 0 to 1,  $SD = 0.20$ ). Moreover, there was clear evidence for overlapping giving behaviors: 19% of the respondents reported one giving behavior, 73% reported more than one type of giving (two types: 26%; three: 24%; four: 17%; five: 6%), and only about 8% did not report any giving behavior.

**Table 1**  
Descriptive statistics for giving-related variables.

Giving-related variables	% of givers at baseline	Mortality rate of givers	Mortality rate of non-givers	$\chi^2$ test <i>p</i> -value
Giving money to family & friends	43.57%	7.17%	10.52%	0.089
Charitable donations	64.25%	10.24%	7.45%	0.000
Giving support to friends	58.47%	9.28%	8.41%	0.001
Volunteering	59.23%	8.63%	9.06%	0.000
Caregiving	33.07%	5.25%	12.44%	0.046
Giving traits	Mean for all 0.78	Mean for the non-deceased 0.79	Mean for the deceased 0.74	<i>t</i> -test <i>p</i> -value 0.000

*N* = 3544.

Of 3354 respondents with non-missing values for all variables, 627 (17.8%) died during the 13-year follow-up period. For each giving category, the mortality rate was lower among givers than non-givers: for those giving money to known others, volunteers, and caregivers, but not for those making charitable donations and giving support.  $\chi^2$  analyses supported a statistically significant association between mortality status and each giving behavior (marginally significant for giving money). A *t*-test showed that people who were deceased during follow-up reported a lower level of prosocial traits than those who were still alive by 2017. Table 1 presents giving-related variables and mortality descriptive statistics in the analysis sample.

We first conducted Cox regressions on each giving variable separately. Because the correlations among the prosocial behaviors and traits were modest (Table 2), which minimized potential multicollinearity, we then ran Cox regressions with all the giving-related variables entered simultaneously (Table 3). This allows us to examine if the effects of each giving variable remain when controlling for the overlaps among giving behaviors.

Giving money to family and friends had a marginally significant association with reduced mortality risk in Model 1 that was not adjusted for any other giving variables or covariates (Model 1; *HR* = 0.87, *p* = 0.10, 95% CI [.74, 1.02]). It was not significantly related to respondents' mortality risk when all giving variables were entered simultaneously (Model 2; *HR* = 0.96, *p* = 0.66, 95% CI [.82, 1.13]), and adding covariates did not change the conclusion (Models 3–6).

### 3.1. Giving money to charity

When examined separately, those donating at least \$500 in the past year had 26% lower mortality risk than who did not (Model 1; *HR* = 0.74, *p* < 0.001, 95% CI [.63, 0.87]). When all giving variables were included, this association became only marginally significant (Model 2; *HR* = 0.86, *p* = 0.08, 95% CI [.73, 1.02]), and was reduced to non-significance in Model 3 and Model 4. However, the association became significant and positive when adjusted for health and health behavior covariates in Model 5 and remained significant in the fully adjusted model, with those who donated \$500 or more having a 32% increase in mortality risk than those who did not (Model 5; *HR* = 1.32, *p* = 0.004, 95% CI [1.09, 1.60]).

Giving support to friends was significantly associated with a 24%

**Table 2**  
Intercorrelations among giving-related variables.

	Giving money to family & friends	Charitable donations	Giving support	Volunteering	Caregiving
Charitable donations	0.18***				
Giving support	0.08***	0.08***			
Volunteering	0.15***	0.30***	0.18***		
Caregiving	0.07***	0.04*	0.07***	0.09***	
Giving-related traits	0.04*	0.07***	0.13***	0.13***	0.09***

*N* = 3544.

\* *p* < 0.05.

\*\*\* *p* < 0.001.

mortality risk reduction compared to those who did not in the separate analysis (Model 1; *HR* = 0.76, *p* = 0.001, 95% CI [.65, 0.89]). This association became marginally significant when all giving variables were included in Model 2 and non-significant in Model 3. It became significant again when adjusted for the social support covariates in Model 6, with those giving support having 19% lower mortality risk than those who did not (Model 6; *HR* = 0.81, *p* = 0.02, 95% CI [.68, 0.97]).

### 3.2. Volunteering

Volunteering was significantly associated with lower mortality risk in all models, with a larger effect size in the unadjusted model than the adjusted models. Compared to non-volunteering, volunteering was significantly associated with a 18% mortality risk reduction in the fully adjusted model (Model 6; *HR* = 0.82, *p* = 0.03, 95% CI [.69, 0.98]).

We also conducted additional analyses using the information on how regularly respondents volunteered in the past 10 years (see Supplementary Materials). In the fully adjusted model, those who reported occasional volunteering had 22% lower mortality risk than those who did not volunteer (*HR* = 0.78, *p* = 0.02, 95% CI [.63, 0.97], *N* = 3543), and the mortality risk was 29% lower for those volunteered regularly sometimes but less other times (*HR* = 0.71, *p* = 0.03, 95% CI [.53, 0.97]). However, the association was not significant for those who regularly volunteered across the whole time (*HR* = 0.97, *p* = 0.78, 95% CI [.76, 1.23]).

### 3.3. Caregiving

Compared to those who never provided care to a non-spouse, respondents who reported caregiving in the past 12 months had a 29% lower mortality risk in the separate analysis (Model 1; *HR* = 0.71, *p* = 0.04, 95% CI [.52, 0.98]). Although not significant in Model 2–5, this result remained unchanged in the fully adjusted model (Model 6; *HR* = 0.71, *p* = 0.04, 95% CI [.51, 0.99]). However, the result was not significant for those who provided care more than 12 months ago.

### 3.4. Giving-related traits

The association between prosocial traits and mortality was

**Table 3**  
Cox proportional hazard models of mortality and six forms of giving.

	(1)	(2)	(3)	(4)	(5)	(6)
Giving \$1000+ to known others	0.873~	0.964	1.073	1.062	1.044	1.033
Donating \$500+	0.741***	0.861~	0.975	0.984	1.201*	1.321**
Giving support to friends	0.763**	0.869~	0.880	0.867~	0.874	0.812*
Volunteering	0.626***	0.712***	0.766**	0.755**	0.787**	0.821*
Caregiving, not in the last 12 months	0.883	0.948	0.935	0.930	0.882	0.882
Caregiving, last 12 months	0.712*	0.806	0.776	0.782	0.729~	0.713*
Giving traits	0.329***	0.405***	0.442***	0.465***	0.532**	0.553**
Age			1.098	1.098	1.131	1.122
Gender			1.289**	1.258*	1.095	1.110
Attended college			0.964	0.916	0.977	0.942
Employed			0.806**	0.801**	0.890	0.878
Net worth: 2nd quartile			0.584***	0.587***	0.706**	0.744*
Net worth: 3rd quartile			0.555***	0.558***	0.651***	0.692**
Net worth: 4th quartile			0.396***	0.394***	0.537***	0.560***
Extraversion				1.000	1.001	1.000
Agreeableness				0.987	0.984	0.986
Conscientiousness				0.989	1.051*	1.057*
Neuroticism				0.992	0.978*	0.979*
Openness				1.016	1.018~	1.013
Self-rated health					0.615***	0.632***
Functional status					1.484***	1.475***
Smoking					1.873***	1.775***
BMI: 25–30					0.722**	0.731**
BMI: 30+					0.842	0.852
# of drinks: 1–2					0.808*	0.813*
# of drinks: 3–5					0.916	0.894
# of drinks: 5+					1.826*	1.766~
Light physical activities: 12–25 h					0.813~	0.798*
Light physical activities: 26–46 h					0.782*	0.767*
Light physical activities: 46 h +					0.794*	0.772*
# of illnesses					0.978	0.981
Cancer					2.405***	2.316**
Heart problems					1.208~	1.216~
Hypertension					1.193*	1.188*
Diabetes					1.588***	1.620***
Lung disease					1.427*	1.407*
Depression					1.222*	1.178~
Cognition: short-term memory					0.987	0.982
Cognition: fluency					0.980~	0.980*
Married						0.779*
Frequency of religious attendance						0.964*
Frequency of getting together with friends						0.952~
Receiving support from friends						1.909**

Model 5 included interactions of health, cancer, and conscient with time to account for their non-proportionality, and Model 6 included interactions of health, cancer, conscient, friends, and receiving support with time to account for their non-proportionality (unreported results of interactions are all significant). Exponentiated coefficients; z statistics in parentheses. N = 3544.

- ~ p < 0.10.
- \* p < 0.05.
- \*\* p < 0.01.
- \*\*\* p < 0.001.

significant in all models, with a decreasing effect size from the unadjusted to the fully adjusted model. In the fully adjusted model, respondents who rated themselves as highest in prosocial traits (i.e., 1) had a 45% lower mortality risk, compared to those who rated themselves as lowest in these traits (i.e., 0; Model 6; HR = 0.55, p = 0.01, 95% CI [.36, 0.85]).

#### 4. Discussion and conclusion

##### 4.1. Discussion

Our study contributes to the literature by examining a broad range of giving-related variables both separately and simultaneously. First, support giving, volunteering, and caregiving were all significantly associated with lower mortality risk among our sample of older adults during the follow-up, even when controlling for all the covariates and the potential overlaps among giving behaviors. The results provide additional evidence for previous research on the associations of these

behaviors with mortality risk (support giving: Brown et al., 2003; Poulin et al., 2013; volunteering: Okun, Yeung, & Brown, 2013; caregiving: Brown et al., 2009).

Second, although prior research finds psychological and physical benefits of donations and other prosocial spending (Choi & Kim, 2011; Dunn, Aknin, & Norton, 2008), we found no significant association of giving money to known others (\$1000 or more) with mortality risk reduction in the fully adjusted model. We also found that charitable donations (\$500 or more) initially had a negative and significant association with mortality risk in the separate analysis, but the association became positive and significant in the fully adjusted model. If giving affects health because it requires disengagement from self-focused concerns (Poulin, 2017), this may be partly because donating entails less *sustained* disengagement from self-focused concerns than the time-giving behaviors, since giving money may often be sporadic and automatic responses to requests from charities or known others (Bekkers & Wiepking, 2010). Unlike the other giving behaviors, giving money also does not require in-person social contact.



More interestingly, our results demonstrated that perceiving oneself as caring and friendly/warm was associated with reduced mortality risk. Moreover, the effect of traits was independent of behaviors. We used a two-item scale as a proxy for prosocial traits, and our finding is consistent with previous research that reported psychological benefits of altruistic attitudes using a four-item scale (e.g. Kahana et al., 2013). Note that unlike the giving traits we focused on, the agreeableness trait from the Big Five did not uniquely predict mortality. While it is unclear from our data exactly why prosocial traits were predictive of reduced mortality, one possibility consistent with prior literature is that behaving prosocially on an everyday basis (that is not captured by the giving measures in this study) requires substantial sustained disengagement from self-focused concerns. On the other hand, it is possible that greater levels of prosocial traits are associated with increased quality of social interactions, though in our data the role of traits remained even when adjusting for receiving social support. Older adults may reduce their prosocial behaviors due to their health status as they grow older (Thoits & Hewitt, 2001), but prosocial traits are likely to stay stable (Midlarsky & Kahana, 2007). Therefore, being caring and friendly may be a long-lasting way to promote health, even into old age.

Several findings are relevant to the idea that giving may promote health by way of reduced self-focused concerns. Across categories, our simultaneous analyses showed that the three time-giving behaviors were associated with a lower mortality risk, but giving money was not. Perceiving oneself as caring and friendly, which reflects an ongoing disengagement from self-focused concerns, was also associated with a lower mortality risk. Within category, our supplementary analysis found that those who volunteered *regularly in some periods* over the past 10 years had a significantly lower mortality risk than non-volunteers, but the effect was smaller for occasional volunteers. These findings suggest that sustained commitment may be a strong indicator of disengagement from self-focused concerns. However, we did not find significant results for those volunteering *regularly across the whole 10-year period*. This is consistent with prior literature that reports potential adverse effects of very high levels of volunteering (Windsor, Anstey, & Rodgers, 2008), and that volunteering is only beneficial to wellbeing when individuals volunteer for a reasonable amount of time (e.g. Choi & Kim, 2011). The specific cutoff point is unknown, but if volunteering commitments are straining, they would likely to be less beneficial.

Why should more committed giving be associated with better health? One potential explanation could be stress regulation. Although there were no measures in this dataset to address this potential explanation, we see it as very plausible. Theoretical models link caregiving and bonding behaviors to stress regulation (Brown & Brown, 2015; Preston, 2013; Swain et al., 2012), and research on prosocial traits and stress hormones support these ideas (Abelson et al., 2014; Ho et al., 2014). This potential explanation should be directly tested in future studies. While our results are largely consistent with the hypothesis that a commitment to sustained helping requires a reduced focus on the self, we did not test this directly, and thus alternate explanations are plausible. Future research should explore the mechanisms that explain the differences in health benefits among different types of giving manifestations.

#### 4.2. Strengths and limitations

One strength of this study is that we used a longitudinal dataset and included a number of covariates. However, there might still be some omitted covariates that might also explain the main effects. For example, we did our best to control for health measures but left out some potential risk factors due to data limitations (e.g. subjective well-being was only available for 8% of the 2004 sample). Although we used two social support covariates, the data does not capture social network size, which also predicts mortality in older age (Holt-Lunstad, Smith, & Layton, 2010). Additionally, we did not rule out the influence of spouse health status, because controlling for spouse health would greatly

reduce the sample size and restrict our sample to married people.

Second, the temporal period of the five giving behaviors varied from past month (giving support) to past year (giving money to charity, caregiving) to past 10 years (giving money to family and friends, volunteering). To make these behavior variables comparable, we rescaled the variables so that they represented the presence or absence of a giving behavior by 2004 (between around 55 and 65 years old).

Third, the homogenous WLS sample, on the one hand, allows us to account for much unobserved variance in testing our hypotheses. On the other hand, it is unclear to what extent our results would generalize more broadly to different populations, both within the U.S. and across cultures. Future researchers should replicate these results in other samples.

#### Conclusion

Overall, this study remains the most comprehensive attempt to address the question of which types of giving are associated with mortality risk. Conceptualizing these results in terms of behaviors that do or do not represent sustained commitment to giving, and thus elicit disengagement from self-focused concerns, may help explain why there should be any differences in health benefits among different types of giving. Practically, the results demonstrate that there is more than one prosocial path to longevity in later life and tentatively suggest that practices may encourage a more thoughtful and committed way to engage in giving.

#### Supplementary materials

Supplementary material associated with this article can be found, in the online version, at doi:10.1016/j.paid.2019.109668.

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