


ARTICLE

Prosocial activity in later life: are informal help and care associated with volunteering and charity?

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(Accepted 13 July 2022; first published online 16 September 2022)

Abstract

Older adults' engagement in various prosocial activities is a salient question in present-day societies that aim to promote active ageing. However, there are only a few studies focusing on associations between several types of prosocial activities, and they have rarely considered help to relatives and friends separately. Moreover, there is lack of studies considering informal monetary help and charity donations when analysing multiple prosocial activities. Using population-based data of older Finns ($N = 2,184$), we examined whether providing informal help (*i.e.* practical help, financial support or personal care) to relatives and friends is associated with participation in volunteering and charity, respectively. Overall, 5 per cent of the participants provided all examined forms of informal help and volunteered, 16 per cent provided two types of help and volunteered, and 23 per cent provided one type of help and volunteered. In addition, 9 per cent of the participants provided all types of informal help and made charitable donations, 33 per cent provided two types of help and made charitable donations, and 54 per cent provided one type of help and made charitable donations. Practical help and care channelled outside the household were associated with an increased probability of volunteering, although they were not associated with the probability of making charitable donations. Practical help, financial support and personal care provided to friends were particularly important predictors of volunteering and charity. These results are discussed in the context of the role overload and role extension hypotheses.

Keywords: care-giving; charity; financial support; practical help; volunteering

Introduction

Active ageing is currently one of the key policy goals in European countries with ageing populations (Foster and Walker, 2015) and is particularly important in Finland, where the population structure is one of the most rapidly ageing in

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Europe (Organisation for Economic Co-operation and Development, 2021a). Active ageing refers to the socially connected ageing process, which may enhance the subjective wellbeing of older adults (World Health Organization, 2015). Although older adults may be involved in several types of prosocial activities (*i.e.* activities that benefit other individuals, their communities or even the entire society), few studies have identified how informal help to relatives and friends is connected to volunteering and charity, respectively. Moreover, prior studies considering the associations between informal help and volunteering have, in most cases, considered only one type of informal help (*e.g.* personal care) at a time (Strauss, 2021; *but see* Burr *et al.*, 2005). Here, we use data from older Finns and consider multiple forms of informal help, that is, we examine whether practical help, financial support, and care provided to relatives and friends are associated with volunteering and charitable giving, respectively.

The commonality among all the aforementioned prosocial engagements is that they are unpaid productive activities aiming to benefit other people. However, they also have distinct features. Volunteering can be defined as unpaid activity directed towards parties with whom the actor does not have familial or friendship obligations (*i.e.* close personal relationships), while charitable giving refers to prosocial spending, that is, donating money for the benefit of others who are not family or friends (Musick and Wilson, 2008). In Finland, volunteering is most often conducted in the social and health sectors, and is typically related to sports, religion and culture (Hämäläinen *et al.*, 2020a). The most common recipients of charity donations in Finland are children, veterans of the Second World War and international disaster survivors (Hämäläinen *et al.*, 2020a). As both volunteers and charity donors, Finns are close to the European average (Bauer *et al.*, 2013).

Prosocial activities also include the gratuitous provision of informal help, such as practical help, personal care and financial aid, to relatives and friends. As a Nordic welfare state, Finland is characterised by relatively generous publicly provided services and cash transfers (Organisation for Economic Co-operation and Development, 2021b). The Finnish state supports its citizens in several ways, meaning that there is a less-severe need for informal help and care compared to countries with scarcer public support. As informal helpers, older Finns are comparable to their Nordic counterparts; thus, while a relatively large number of older adults provide occasional support to their relatives and friends, only a few consistently provide informal help (Hämäläinen *et al.*, 2021; Hämäläinen and Tanskanen, 2021).

Although prosocial activities may often be highly rewarding for the provider (*e.g.* by improving one's health and subjective wellbeing; Burr *et al.*, 2021), participating in multiple engagements could be demanding owing to constraints related to time and other resources (Choi *et al.*, 2007). Hence, based on the *role overload* approach, individuals may be reluctant to engage in multiple prosocial activities simultaneously. Role overload has previously been considered to exist between volunteering and practical support or care-giving (Hank and Stuck, 2008; Strauss, 2021). Here, we extend this perspective to monetary support, because financial support given to relatives or friends may decrease the possibility of donating to charity and *vice versa*. As financial resources are limited, providing financial support to more than one party may lead to financial overload.

The *role extension* approach provides an alternative perspective and stresses the fact that multiple activities may complement each other (Hank and Stuck, 2008). According to this view, participating in one type of unpaid activity facilitates engagement in other types of activities as well (Strauss, 2021). People who are engaged in helping others are also likely to interact with people who have prosocial tendencies, and these social connections may provide new opportunities to participate in various activities (Burr *et al.*, 2005). For instance, individuals who provide support for family members outside their immediate household are typically part of both informal and formal social networks that can also promote prosocial behaviour via, for example, volunteering and charity (Jacobs *et al.*, 2016). Thus, at least when the investment in one type of activity is not too demanding, different forms of social engagement may strengthen each other.

Prior studies investigating the association between informal help and volunteering have provided more support for role extension than the role overload hypothesis. For instance, according to Swedish studies, a large share of middle-aged and older adults engage in informal help-giving (*i.e.* practical help or care) outside their household and volunteering (Jegermalm and Jeppsson Grassman, 2009, 2013). An American study found that older care-givers, who provided or organised care for a relative or friend in need, reported more hours of volunteering than did non-care-givers (Burr *et al.*, 2005). A multinational study of older adults from 11 European countries found that three forms of prosocial activities, *i.e.* volunteering, care-giving to a sick or disabled person, and informal help to relatives or friends, were positively correlated (Hank and Stuck, 2008). A recent study utilising longitudinal data from 13 European countries examined the association between care-giving and volunteering, distinguishing older adults who had provided personal care within their own households from those who had provided personal care or household help to a relative or friend outside their household (Strauss, 2021). It was found that care-givers were more likely to volunteer than non-care-givers; however, the positive association was only found for those who provided care outside their household, and the study did not detect a positive effect of care-giving within the household (*i.e.* typically spousal care) on volunteering (Strauss, 2021).

The present study makes three important contributions to the field. First, prior studies have often considered only a few prosocial activities at a time but here we focus on relationships between several types of prosocial activities. Second, to the best of our knowledge, no prior study has included prosocial spending (*i.e.* informal financial support and charity donations) when examining multiple prosocial activities. Our study makes this contribution. Third, prior studies have typically lumped relatives and friends into the same category but we consider practical help, financial support and care channelled towards different groups of people (relatives and friends) as prior studies have shown that huge variation exists in the motivation to provide support to different groups of individuals (Tanskanen and Danielsbacka, 2019), which may also influence the willingness to engage in different prosocial activities.

Research questions

We examine whether three types of informal help (*i.e.* practical help, financial support and personal care) are associated with volunteering or charitable giving. We

will focus on help channelled outside the household because prior studies have indicated that informal help given outside the household tends to be more relevant than help given inside the household when different types of help are considered (Choi *et al.*, 2007; Strauss, 2021). We start our analyses by examining the overall structure of prosocial engagements among older Finns, *i.e.* how the different forms of prosocial activities overlap with each other, by asking:

- Question 1: What is the proportion of older adults who provide multiple types of informal help while participating in voluntary work or charity?

After forming a picture of the structure of multiple prosocial engagements, we take a closer look at the relationship between the types of support and investigate whether a particular form of informal help serves as a predictor for volunteering or charitable giving. Moreover, we consider informal help provided to relatives and friends; we ask:

- Question 2: Can the provision of practical help, financial support and personal care predict volunteering or charitable giving?
- Question 3: Can the provision of informal help to relatives and friends predict volunteering and charitable giving, respectively?

Material and methods

Sample and setting

To study the associations between different prosocial activities, we used the Generational Transmissions in Finland (Gentrans) survey that gathered information on Finnish older adults born between 1945 and 1950. This nationally representative survey was conducted by Statistics Finland in 2012. The present sample consisted of 2,184 older adults aged 62–67 years during data collection.

Variables

Volunteering and charity were the dependent variables. In the Gentrans survey, participants were asked to report whether they had engaged in volunteering in the last 12 months (0 = no, 1 = yes). In addition, they were asked to report whether they had donated money to charity in the last 12 months (0 = no, 1 = yes).

The main independent variables measure informal help to relatives and friends. Participants were asked to report whether they had provided practical help, financial support and personal care to their relatives or friends outside their households. Information on these three forms of prosocial activities was gathered separately by asking how often the participants had provided help/care in the previous 12 months using a five-point scale (0 = never to 4 = several times a week). Regarding practical help and financial support, the participants were asked about help given to children, parents, siblings, aunts/uncles, cousins and friends, and in the case of personal care, they were asked about care-giving to parents, siblings, aunts/uncles, cousins and friends. Note that information about parents' care given to their adult children was not considered in the survey because it is extremely rare in contemporary Finland

(Hämäläinen and Tanskanen, 2021). To investigate whether different types of informal help are associated with volunteering or charity, the variables (practical help, financial support and personal care) were coded as separate dummy variables and had values of 0 = no help and 1 = at least occasional help.

Data analysis

After examining how each type of support is associated with volunteering or charity, we widened our investigation by including the recipients of informal support in the analyses. For these analyses, we constructed new variables consisting of information regarding which type of informal help was provided: relatives (0 = no help to relatives, 1 = help to at least one relative) and friends (0 = no help to friends, 1 = help to at least one friend). Owing to the low number of observations, we were unable to construct more accurate variables in terms of target and intensity of provided help without losing too much statistical power. Instead, we conducted additional analyses using variables in which we combined the types of help to examine the association between the number of recipients and volunteering or charity (Appendix Table A1). For sensitivity purposes, we also conducted the analyses introducing all the groups of relatives (*i.e.* parents, parents' siblings, siblings, children and cousins) separately in the models (Appendix Tables A2–A4).

We started our analyses by examining the structure of provided help by using the dummy variables of informal help and constructing Venn diagrams illustrating all the possible combinations of different types of help. The Venn diagrams were constructed using the R package 'ggvenn' with RStudio (Linlin, 2021). Along with the diagrams, we constructed a variable consisting of frequencies of all possible combinations of provided help. The frequencies and distribution of this variable are presented only in the text, although the same can be calculated from the diagrams as well.

Next, we executed binary logistic regression analyses where the dummy variables were simultaneously fitted in the models, *i.e.* we predicted volunteering and charitable giving by the provision of one type of informal help while the other types were held constant. Moreover, we distinguished whether the recipient of informal help was a relative or friend, and predicted volunteering and charitable giving separately by the provision of informal help to these groups. In the analyses, the variables relating to providing help to relatives and friends were introduced simultaneously in the models, meaning that volunteering and charitable giving are predicted by help to one of these two, while help to the other is held constant.

To achieve more robust results, we controlled for several variables that have been shown to be associated with volunteering and charity (Musick and Wilson, 2008; Hank and Erlinghagen, 2010): participants' gender, partnership status, educational level, employment status, perceived financial condition, self-rated health, number of close relatives and number of friends (descriptive statistics are presented in Table 1). The findings were illustrated by calculating the predicted probabilities (and 95% confidence intervals (CIs)) of volunteering or charity using informal help variables from the logistic regression models. The analyses were conducted using Stata version 17 (StataCorp., College Station, TX, USA).

To address the multiple testing issue, together with the traditional *p*-value, we calculate the sharpened False Discovery Rate (FDR) adjusted *q*-values (Benjamini and

Table 1. Descriptive statistics

	N	%	Mean
Gender:			
Female	1,242	56.9	
Male	942	43.1	
Partnership status:			
No spouse/partner	543	24.9	
Have a spouse/partner	1,641	75.1	
Education:			
Primary or lower secondary level	709	32.5	
Upper secondary level	1,102	50.5	
Lower degree-level tertiary education	146	6.7	
Higher degree-level tertiary education	227	10.4	
Employment status:			
Not working	1,815	83.1	
Working	369	16.9	
Financial condition:			
Low income	980	44.9	
Middle income	816	37.4	
At least comfortably off	388	17.8	
Self-rated health:			
Poor or very poor	129	5.9	
Fair	913	41.8	
Good	934	42.8	
Very good	208	9.5	
Number of relatives	2,184		6.5
Number of friends	2,184		5.4

Note: N = 2,184.

Hochberg, 1995; Benjamini *et al.*, 2006). Similarly to the p -value, the sharpened q -value is the smallest level q at which the hypothesis would be rejected while controlling the FDR, *i.e.* the expected proportion of rejections that are type I errors (false rejections). The approach is preferred to alternative ones, *e.g.* Bonferroni's correction, because it is more powerful, especially in the presence of many tests. The sharpened q -values have been computed using the Stata code provided by Michael L. Anderson (https://are.berkeley.edu/~mlanderson/ARE_Website/Research.html).

Although our paper is explanatory, *i.e.* the goal is to examine the association of some explanatory variables, net of the effect of controls, with the outcome(s), for transparency we report the pseudo- R^2 for each model. The pseudo- R^2

(McFadden, 1974) is defined as $1 - L_1/L_0$, where L_1 is the log likelihood of the full model and L_0 is the log likelihood of the 'constant-only' model. Thus, the pseudo- R^2 is simply the log likelihood on a scale where 0 corresponds to the 'constant-only' model and 1 corresponds to perfect prediction for a discrete model (in which case the overall log likelihood is 0).

Results

Structure of prosocial engagement

First, we provide descriptive results regarding the structure of prosocial engagement. Overall, 21 per cent of the participants had engaged in volunteering, and 58 per cent had donated money to charity. Moreover, 72 per cent had provided practical help, 44 per cent financial support and 24 per cent personal care for relatives or friends. The Venn diagrams presented in Figures 1 and 2 illustrate all possible combinations of the different forms of prosocial activities. The figures are constructed according to our further analyses, that is, separately for volunteering and charity, and both include only participants who provided at least one type of help. Figure 1 shows the combinations of volunteering and three types of informal help. Every ellipse represents one type of help (e.g. the left-most consists of all participants who had engaged in volunteering) and the intersections of the ellipses illustrate the overlap of the provision of different types of help. Thus, the intersection of all the ellipses in the middle of the diagram shows the share of those participants who had provided all four types of help, that is, 5 per cent. About 16 per cent had provided at least two types of informal help, and 23 per cent had provided at least one type of informal help and participated in volunteering. About 3 per cent had volunteered but had not provided any informal help to friends or relatives. Figure 2 presents the combinations of informal help and charity. In total, 9 per cent of the participants had provided all four types of help, which is illustrated by the intersection of all the ellipses in the middle of the diagram. Moreover, 33 per cent had provided at least two types of informal help, while 54 per cent had provided at least one type of informal help and donated to charity. Finally, 10 per cent had participated in charity but had not provided any informal help to friends or relatives.

Table 2 shows the results of the logistic regression model for predicting volunteering among older adults. Participants who provided practical help were also more likely to volunteer than those who did not provide practical help (predicted probability, 95% CIs: no help = 17.7, 14.3–21.0 *versus* practical help = 23.0, 21.0–25.0). Similarly, care-givers were more likely to volunteer than non-care-givers (predicted probability, 95% CIs: no help = 17.7, 15.9–19.6 *versus* personal care = 31.8, 27.9–35.8). In contrast, individuals who provided financial support were not significantly more likely to volunteer than individuals who did not provide financial support (predicted probability, 95% CIs: no help = 20.2, 8.0–22.5 *versus* financial support = 22.8, 20.2–25.3).

Table 2 also shows that women and individuals with higher educational levels were more likely to volunteer than men and those with lower educational levels, respectively. Individuals engaged in paid work were less likely to volunteer than non-workers. Moreover, those with more close relatives and friends were more likely to volunteer compared to those with fewer close relatives or friends. We

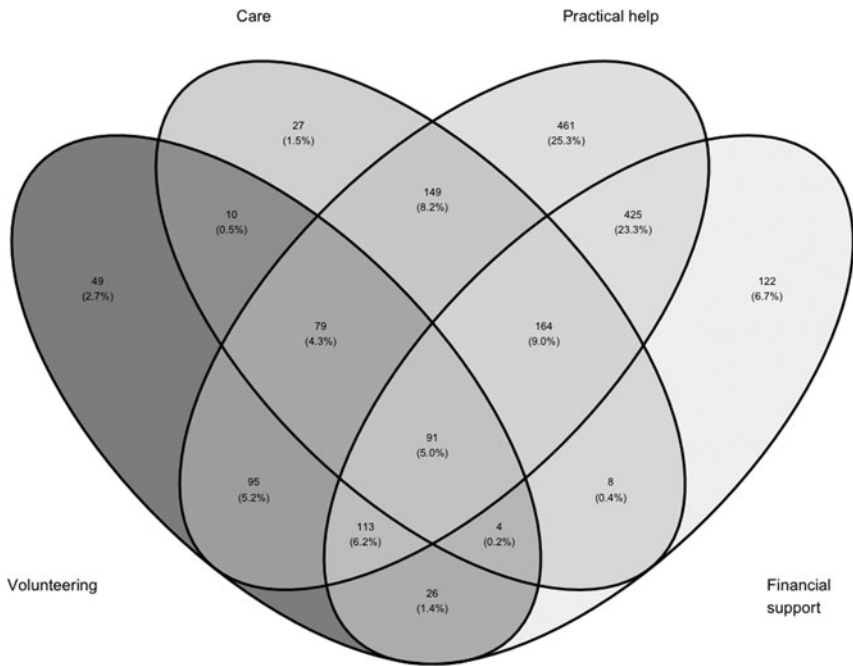


Figure 1. Combinations of volunteering and different types of informal support provided. Participants engaging in at least one prosocial activity.

Note: $N = 1,823$.

also tested the potential differences in multiple engagements between women and men and studied the probability of volunteering by including interaction terms between practical help and gender, between financial support and gender, and between care-giving and gender. However, all these interaction effects were insignificant (not shown in the tables), indicating that the effect was similar in women and men.

The factors associated with charitable giving are presented in Table 2. Those who provided practical help were not significantly more likely to make charitable donations compared to non-helpers (predicted probability, 95% CIs: no help = 55.5, 51.5–59.5 *versus* practical help = 58.8, 56.4–61.2). In addition, there were only marginally significant differences in the likelihood of making charitable donations between financial helpers and non-helpers (predicted probability, 95% CIs: no help = 56.2, 53.5–58.9 *versus* financial support = 60.0, 56.9–63.1) and between care-givers and non-care-givers (predicted probability, 95% CIs: no help = 56.8, 54.4–59.1 *versus* personal care = 61.2, 57.0–65.4).

As Table 2 shows, women, individuals with higher educational levels and those with good self-perceived financial condition were more likely to make charitable donations than men, individuals with lower educational levels and those with poor self-perceived financial condition, respectively. People with good or fair self-rated health were more likely to donate to charity than those with poor or very poor self-rated health. Individuals having a partner were more likely to make charitable

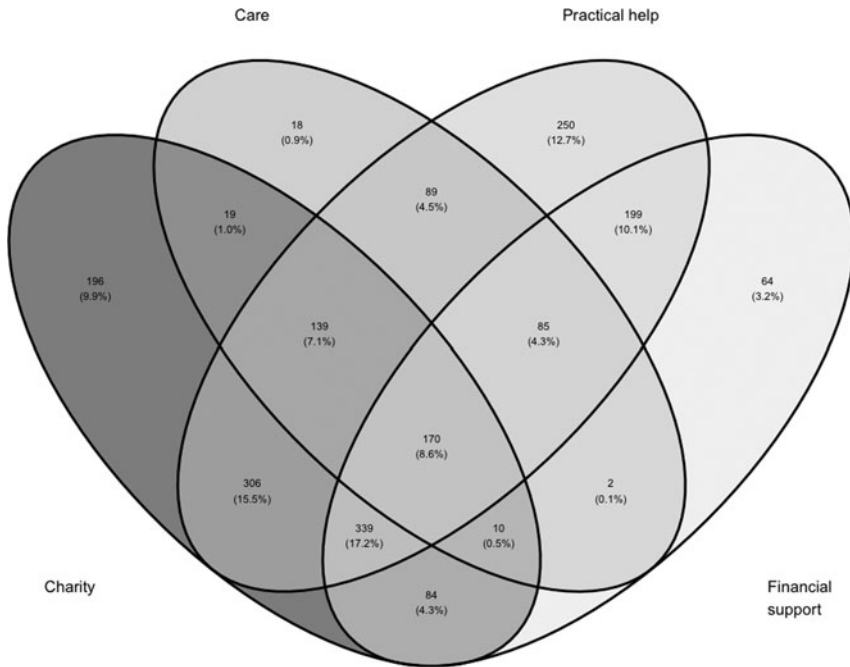


Figure 2. Combinations of charity and different types of informal support provided. Participants engaging in at least one prosocial activity.

Note: $N = 1,970$.

donations than those without a partner. Finally, those with a higher number of close relatives were more likely to participate in charity than those with fewer close relatives. Potential differences between women and men in charitable giving were investigated by including the interaction terms between practical help and gender, between financial support and gender, and between care-giving and gender. However, all these interaction effects were insignificant (not shown in the tables). We notice that the sharpened q -values are generally very similar to the corresponding p -values, when these are relatively small. Thus, the conclusions about the relevant associations discussed here and below are not affected by the p -value corrections. As is often the case, the q -values are higher than the p -values for small p -values, while they are lower for high p -values which would point anyway to non-rejections of null hypotheses (Anderson, 2008).

For sensitivity purposes, we measured the intensity of practical help, financial support and personal care by generating a categorical variable based on the mean frequency of these three types of involvement. In addition, we constructed variables consisting of the total frequency of all provided practical help, financial support and personal care (e.g. sum of the frequencies of practical help to all relatives and friends). However, the sensitivity analyses yielded results similar to those of the main analyses with dichotomous variables (not shown in the tables).

Engagement in volunteering and charity by type and recipient of informal help

Next, we considered the target of informal support and investigated whether help was given to friends or relatives (Table 3). Practical help provided to friends was associated with an increased likelihood of volunteering (predicted probability, 95% CIs: no help = 18.3, 16.5–20.2 *versus* practical help = 29.9, 26.1–33.7) as well as with an increased probability of charitable giving (predicted probability, 95% CIs: no help = 55.3, 52.9–57.6 *versus* practical help = 65.2, 61.3–69.1). Regarding practical help to relatives, we did not detect any statistically significant associations.

After that, volunteering and charity were predicted by financial support provided to relatives and friends (Table 4). It was observed that financial support to friends was associated with both an increased likelihood of volunteering (predicted probability, 95% CIs: no help = 20.7, 19.0–22.4 *versus* financial support = 45.9, 32.8–58.9) and making charitable donations (predicted probability, 95% CIs: no help = 57.3, 55.3–59.3 *versus* financial support = 77.3, 66.7–88.0). Again, regarding financial support to relatives, no statistically significant associations were observed.

Finally, Table 5 considers the associations between volunteering and charity and care-giving to relatives and friends, respectively. Provision of personal care to relatives (predicted probability, 95% CIs: no help = 19.9, 18.1–21.7 *versus* personal care = 27.6, 23.4–31.8) and friends (predicted probability, 95% CIs: no help = 18.9, 17.2–20.6 *versus* personal care = 44.4, 37.7–51.1) was associated with an increased probability of volunteering. Moreover, care-giving to friends (predicted probability, 95% CI: no help = 57.1, 55.0–59.2 *versus* personal care = 65.2, 58.8–71.5) was associated with an increased likelihood of making charitable donations.

For sensitivity purposes, we constructed new variables including both practical help and personal care, which enabled us – owing to the increased number of observations – to investigate whether supporting more or fewer parties is associated with volunteering and charity. The results are in line with the main analyses; providing more support to friends increased the likelihood of volunteering and charity, while supporting relatives was only partially associated with volunteering (Appendix Table A1). In addition, we ran the analyses by introducing all groups of relatives separately in the models (Appendix Tables A2–A4). Overall, the results were similar to those presented above regarding the association between providing informal help to relatives and volunteering/charity, although a few significant associations were observed. Providing financial support to different groups of relatives (*i.e.* children, parents, other kin) was not associated with an increased or decreased likelihood of volunteering or charitable giving. Similarly, giving practical help to relatives (children, parents, siblings, parents' siblings or cousins) did not predict volunteering. However, providing practical help to parents predicted less charitable giving, and practical help to cousins or parents' siblings was associated with an increased likelihood of participating in charity. Moreover, provision of personal care to parents was associated with a decreased likelihood of charitable giving, while caring for parents' siblings was associated with an increased likelihood of volunteering and charitable giving.

Table 2. Predicting volunteering and charitable giving by practical help, financial support, and care and sociodemographic factors

	Volunteering												Charity											
	Unadjusted						Adjusted						Unadjusted						Adjusted					
				95% CI						95% CI						95% CI						95% CI		
	OR	SE	<i>p</i>	<i>q</i>	lb	ub	OR	SE	<i>p</i>	<i>q</i>	lb	ub	OR	SE	<i>p</i>	<i>q</i>	lb	ub	OR	SE	<i>p</i>	<i>q</i>	lb	ub
Practical help:																								
No	Ref.						Ref.						Ref.						Ref.					
Yes	1.83	0.24	0.000	0.001	1.42	2.36	1.39	0.19	0.020	0.018	1.05	1.83	1.48	0.14	0.000	0.001	1.22	1.78	1.15	0.12	0.176	0.093	0.94	1.42
Financial support:																								
No	Ref.						Ref.						Ref.						Ref.					
Yes	1.39	0.15	0.002	0.004	1.14	1.71	1.17	0.13	0.156	0.084	0.94	1.47	1.49	0.13	0.000	0.001	1.25	1.77	1.18	0.11	0.079	0.049	0.98	1.43
Care:																								
No	Ref.						Ref.						Ref.						Ref.					
Yes	2.56	0.29	0.000	0.001	2.05	3.19	2.24	0.27	0.000	0.001	1.77	2.83	1.37	0.14	0.002	0.004	1.12	1.68	1.22	0.14	0.074	0.048	0.98	1.52
Gender:																								
Female	Ref.						Ref.						Ref.						Ref.					
Male	0.70	0.08	0.001	0.003	0.57	0.87	0.72	0.08	0.004	0.006	0.57	0.90	0.74	0.07	0.001	0.003	0.63	0.88	0.68	0.06	0.000	0.001	0.56	0.82
Partnership status:																								
No partner/spouse	Ref.						Ref.						Ref.						Ref.					
Has a partner/spouse	0.89	0.11	0.341	0.154	0.71	1.13	0.88	0.11	0.295	0.138	0.68	1.12	1.61	0.16	0.000	0.001	1.33	1.96	1.52	0.16	0.000	0.001	1.23	1.87

(Continued)

Table 2. (Continued.)

	Volunteering												Charity											
	Unadjusted						Adjusted						Unadjusted						Adjusted					
				95% CI						95% CI						95% CI						95% CI		
	OR	SE	<i>p</i>	<i>q</i>	lb	ub	OR	SE	<i>p</i>	<i>q</i>	lb	ub	OR	SE	<i>p</i>	<i>q</i>	lb	ub	OR	SE	<i>p</i>	<i>q</i>	lb	ub
Education:																								
Primary or lower secondary level	Ref.						Ref.						Ref.						Ref.					
Upper secondary level	1.39	0.17	0.009	0.010	1.09	1.77	1.30	0.17	0.045	0.033	1.01	1.68	1.59	0.15	0.000	0.001	1.32	1.93	1.37	0.14	0.002	0.004	1.12	1.67
Lower degree-level tertiary education	2.45	0.50	0.000	0.001	1.65	3.65	1.89	0.41	0.003	0.005	1.23	2.90	2.89	0.58	0.000	0.001	1.95	4.28	2.08	0.44	0.001	0.003	1.38	3.14
Higher degree-level tertiary education	1.88	0.34	0.000	0.001	1.32	2.68	1.71	0.35	0.009	0.010	1.14	2.55	2.84	0.47	0.000	0.001	2.05	3.94	2.06	0.38	0.000	0.001	1.44	2.95
Employment status:																								
Not working	Ref.						Ref.						Ref.						Ref.					
Working	0.77	0.11	0.073	0.047	0.58	1.02	0.70	0.11	0.020	0.018	0.51	0.95	1.14	0.13	0.267	0.129	0.91	1.43	0.95	0.12	0.689	0.269	0.75	1.21
Financial condition:																								
Low income	Ref.						Ref.						Ref.						Ref.					
Middle income	1.11	0.13	0.394	0.170	0.88	1.39	1.01	0.13	0.923	0.330	0.79	1.30	1.59	0.15	0.000	0.001	1.32	1.92	1.33	0.14	0.006	0.008	1.09	1.64
At least comfortably off	1.42	0.20	0.014	0.014	1.07	1.87	1.21	0.20	0.268	0.129	0.87	1.68	2.22	0.28	0.000	0.001	1.73	2.84	1.72	0.25	0.000	0.001	1.29	2.29
Self-rated health:																								
Poor or very poor	Ref.						Ref.						Ref.						Ref.					
Fair	1.26	0.31	0.343	0.155	0.78	2.03	1.10	0.28	0.708	0.277	0.67	1.81	1.88	0.36	0.001	0.003	1.29	2.75	1.53	0.31	0.033	0.026	1.04	2.27
Good	1.22	0.30	0.422	0.178	0.75	1.96	0.96	0.25	0.867	0.319	0.58	1.59	2.56	0.49	0.000	0.001	1.76	3.74	1.71	0.35	0.009	0.010	1.15	2.54

(Continued)

Table 2. (Continued.)

	Volunteering												Charity											
	Unadjusted						Adjusted						Unadjusted						Adjusted					
	95% CI						95% CI						95% CI						95% CI					
	OR	SE	p	q	lb	ub	OR	SE	p	q	lb	ub	OR	SE	p	q	lb	ub	OR	SE	p	q	lb	ub
Very good	1.58	0.44	0.104	0.061	0.91	2.73	1.20	0.36	0.544	0.220	0.67	2.15	2.21	0.51	0.001	0.003	1.41	3.47	1.27	0.31	0.322	0.147	0.79	2.06
Number of relatives	1.05	0.01	0.000	0.001	1.03	1.07	1.03	0.01	0.015	0.015	1.01	1.05	1.06	0.01	0.000	0.001	1.04	1.08	1.05	0.01	0.000	0.001	1.03	1.08
Number of friends	1.05	0.01	0.000	0.001	1.03	1.08	1.04	0.01	0.001	0.003	1.02	1.07	1.01	0.01	0.175	0.093	0.99	1.04	0.99	0.01	0.488	0.200	0.97	1.02
Pseudo R ²	0.062												0.059											

Notes: Logistic regression (N = 2,184). OR: odds ratio. SE: standard error. q: sharpened q-value. CI: confidence interval. lb: lower bound. ub: upper bound. Ref.: reference category.

Table 3. Predicting volunteering and charitable giving by practical help given to relatives and friends

	Volunteering												Charity											
	Unadjusted						Adjusted						Unadjusted						Adjusted					
	95% CI						95% CI						95% CI						95% CI					
	OR	SE	p	q	lb	ub	OR	SE	p	q	lb	ub	OR	SE	p	q	lb	ub	OR	SE	p	q	lb	ub
Help to relatives:																								
No	Ref.						Ref.						Ref.						Ref.					
Yes	1.43	0.17	0.002	0.004	1.14	1.79	1.23	0.15	0.087	0.053	0.97	1.57	1.42	0.13	0.000	0.001	1.18	1.69	1.10	0.11	0.328	0.149	0.91	1.34
Help to friends:																								
No	Ref.						Ref.						Ref.						Ref.					
Yes	2.03	0.23	0.000	0.001	1.63	2.52	1.94	0.23	0.000	0.001	1.54	2.45	1.55	0.16	0.000	0.001	1.27	1.89	1.56	0.17	0.000	0.001	1.26	1.94
Gender:																								
Female							Ref.												Ref.					
Male							0.62	0.07	0.000	0.001	0.49	0.77							0.64	0.06	0.000	0.001	0.53	0.77
Partnership status:																								
No partner/ spouse							Ref.												Ref.					
Has a partner/ spouse							0.92	0.12	0.532	0.216	0.72	1.18							1.60	0.17	0.000	0.001	1.29	1.97
Education:																								

Primary or lower secondary level	Ref.						Ref.					
Upper secondary level	1.29	0.17	0.052	0.037	1.00	1.66	1.36	0.14	0.003	0.005	1.11	1.66
Lower degree-level tertiary education	1.92	0.42	0.002	0.004	1.26	2.94	2.08	0.44	0.001	0.003	1.37	3.14
Higher degree-level tertiary education	1.66	0.34	0.012	0.013	1.12	2.47	2.03	0.37	0.000	0.001	1.41	2.90
Employment status:												
Not working	Ref.						Ref.					
Working	0.71	0.11	0.025	0.022	0.52	0.96	0.96	0.12	0.750	0.289	0.75	1.23
Financial condition:												
Low income	Ref.						Ref.					
Middle income	1.04	0.13	0.764	0.294	0.81	1.33	1.36	0.14	0.003	0.005	1.11	1.67
At least comfortably off	1.23	0.20	0.215	0.110	0.89	1.70	1.77	0.26	0.000	0.001	1.33	2.36
Self-rated health:												
Poor or very poor	Ref.						Ref.					
Fair	1.14	0.29	0.599	0.238	0.70	1.87	1.56	0.31	0.027	0.022	1.05	2.31
Good	0.99	0.25	0.960	0.340	0.60	1.63	1.74	0.36	0.007	0.009	1.17	2.60
Very good	1.18	0.35	0.585	0.233	0.66	2.10	1.29	0.32	0.297	0.138	0.80	2.09

(Continued)

Table 3. (Continued.)

	Volunteering												Charity											
	Unadjusted						Adjusted						Unadjusted						Adjusted					
	95% CI						95% CI						95% CI						95% CI					
	OR	SE	p	q	lb	ub	OR	SE	p	q	lb	ub	OR	SE	p	q	lb	ub	OR	SE	p	q	lb	ub
Number of relatives						1.03	0.01	0.008	0.010	1.01	1.05							1.05	0.01	0.000	0.001	1.03	1.08	
Number of friends						1.04	0.01	0.004	0.006	1.01	1.07							0.99	0.01	0.347	0.155	0.96	1.01	
Pseudo R ²						0.05												0.06						

Notes: Logistic regression (N = 2,184). OR: odds ratio. SE: standard error. q: sharpened q-value. CI: confidence interval. lb: lower bound. ub: upper bound. Ref.: reference category.

Table 4. Predicting volunteering and charitable giving by financial support given to relatives and friends

	Volunteering												Charity											
	Unadjusted						Adjusted						Unadjusted						Adjusted					
	95% CI						95% CI						95% CI						95% CI					
	OR	SE	p	q	lb	ub	OR	SE	p	q	lb	ub	OR	SE	p	q	lb	ub	OR	SE	p	q	lb	ub
Support to relatives:																								
No	Ref.						Ref.						Ref.						Ref.					
Yes	1.33	0.14	0.007	0.009	1.08	1.63	1.19	0.13	0.109	0.062	0.96	1.49	1.46	0.13	0.000	0.001	1.23	1.74	1.16	0.11	0.112	0.064	0.97	1.40
Support to friends:																								
No	Ref.						Ref.						Ref.						Ref.					
Yes	3.70	1.02	0.000	0.001	2.16	6.35	3.41	0.97	0.000	0.001	1.95	5.97	2.40	0.77	0.006	0.008	1.28	4.50	2.72	0.90	0.003	0.005	1.42	5.21
Gender:																								
Female							Ref.												Ref.					
Male							0.68	0.08	0.001	0.003	0.54	0.85							0.68	0.06	0.000	0.001	0.56	0.81
Partnership status:																								
No partner/spouse							Ref.												Ref.					
Has a partner/spouse							0.90	0.11	0.418	0.177	0.70	1.16							1.57	0.17	0.000	0.001	1.27	1.93
Education:																								
Primary or lower secondary level							Ref.												Ref.					
Upper secondary level							1.33	0.17	0.029	0.024	1.03	1.71							1.38	0.14	0.002	0.004	1.13	1.68
Lower degree-level tertiary education							2.09	0.45	0.001	0.003	1.37	3.18							2.17	0.46	0.000	0.001	1.44	3.27

(Continued)

Table 4. (Continued.)

	Volunteering												Charity											
	Unadjusted						Adjusted						Unadjusted						Adjusted					
					95% CI						95% CI						95% CI						95% CI	
	OR	SE	<i>p</i>	<i>q</i>	lb	ub	OR	SE	<i>p</i>	<i>q</i>	lb	ub	OR	SE	<i>p</i>	<i>q</i>	lb	ub	OR	SE	<i>p</i>	<i>q</i>	lb	ub
Higher degree-level tertiary education						1.73	0.35	0.007	0.009	1.16	2.57							2.07	0.38	0.000	0.001	1.44	2.97	
Employment status:																								
Not working						Ref.													Ref.					
Working						0.70	0.11	0.021	0.019	0.52	0.95							0.95	0.12	0.681	0.268	0.75	1.21	
Financial condition:																								
Low income						Ref.													Ref.					
Middle income						1.06	0.13	0.658	0.258	0.83	1.35							1.36	0.14	0.003	0.005	1.11	1.67	
At least comfortably off						1.20	0.20	0.277	0.132	0.86	1.66							1.71	0.25	0.000	0.001	1.28	2.28	
Self-rated health:																								
Poor or very poor						Ref.													Ref.					
Fair						1.16	0.29	0.561	0.225	0.71	1.90							1.55	0.31	0.028	0.023	1.05	2.30	
Good						1.02	0.26	0.928	0.331	0.62	1.69							1.75	0.36	0.006	0.008	1.17	2.61	
Very good						1.21	0.36	0.515	0.211	0.68	2.17							1.29	0.32	0.294	0.138	0.80	2.09	
Number of relatives						1.03	0.01	0.003	0.005	1.01	1.06							1.06	0.01	0.000	0.001	1.04	1.08	
Number of friends						1.04	0.01	0.004	0.006	1.01	1.07							0.99	0.01	0.413	0.175	0.97	1.01	
Pseudo <i>R</i> ²						0.041												0.060						

Notes: Logistic regression (N = 2,184). OR: odds ratio. SE: standard error. q: sharpened q-value. CI: confidence interval. lb: lower bound. ub: upper bound. Ref.: reference category.

Table 5. Predicting volunteering and charitable giving by care given to relatives and friends

	Volunteering												Charity											
	Unadjusted						Adjusted						Unadjusted						Adjusted					
	95% CI						95% CI						95% CI						95% CI					
	OR	SE	p	q	lb	ub	OR	SE	p	q	lb	ub	OR	SE	p	q	lb	ub	OR	SE	p	q	lb	ub
Care to relatives:																								
No	Ref.						Ref.						Ref.						Ref.					
Yes	1.95	0.24	0.000	0.001	1.53	2.49	1.59	0.21	0.000	0.001	1.23	2.05	1.40	0.16	0.004	0.006	1.12	1.75	1.16	0.14	0.231	0.116	0.91	1.47
Care to friends:																								
No	Ref.						Ref.						Ref.						Ref.					
Yes	3.87	0.58	0.000	0.001	2.88	5.20	3.65	0.58	0.000	0.001	2.68	4.97	1.37	0.21	0.040	0.030	1.01	1.84	1.45	0.23	0.022	0.020	1.05	1.98
Gender:																								
Female							Ref.												Ref.					
Male							0.75	0.09	0.011	0.012	0.59	0.94							0.69	0.07	0.000	0.001	0.58	0.83
Partnership status:																								
No partner/spouse							Ref.												Ref.					
Has a partner/spouse							0.93	0.12	0.568	0.227	0.72	1.19							1.56	0.17	0.000	0.001	1.27	1.92
Education:																								

(Continued)

Table 5. (Continued.)

	Volunteering												Charity											
	Unadjusted						Adjusted						Unadjusted						Adjusted					
	95% CI						95% CI						95% CI						95% CI					
	OR	SE	p	q	lb	ub	OR	SE	p	q	lb	ub	OR	SE	p	q	lb	ub	OR	SE	p	q	lb	ub
Primary or lower secondary level							Ref.												Ref.					
Upper secondary level							1.32	0.17	0.036	0.027	1.02	1.70							1.40	0.14	0.001	0.003	1.14	1.70
Lower degree-level tertiary education							2.05	0.45	0.001	0.003	1.34	3.13							2.19	0.46	0.000	0.001	1.45	3.30
Higher degree-level tertiary education							1.83	0.38	0.003	0.005	1.22	2.74							2.16	0.39	0.000	0.001	1.51	3.09
Employment status:																								
Not working							Ref.												Ref.					
Working							0.71	0.11	0.026	0.022	0.52	0.96							0.96	0.12	0.722	0.279	0.75	1.22
Financial condition:																								
Low income							Ref.												Ref.					
							1.06	0.14	0.648	0.254	0.82	1.36							1.37	0.14	0.002	0.004	1.12	1.68

Middle income														
At least comfortably off	1.27	0.21	0.164	0.088	0.91	1.77		1.77	0.26	0.000	0.001	1.33	2.36	
Self-rated health:														
Poor or very poor	Ref.							Ref.						
Fair	1.18	0.30	0.525	0.215	0.71	1.94		1.56	0.31	0.026	0.022	1.06	2.31	
Good	1.05	0.27	0.854	0.319	0.63	1.75		1.76	0.36	0.005	0.007	1.18	2.62	
Very good	1.33	0.40	0.346	0.155	0.74	2.39		1.33	0.32	0.248	0.124	0.82	2.14	
Number of relatives	1.03	0.01	0.004	0.006	1.01	1.06		1.06	0.01	0.000	0.001	1.03	1.08	
Number of friends	1.04	0.01	0.003	0.005	1.01	1.07		0.99	0.01	0.426	0.178	0.97	1.01	
Pseudo R^2	0.069							0.058						

Notes: Logistic regression (N = 2,184). OR: odds ratio. SE: standard error. q : sharpened q -value. CI: confidence interval. lb: lower bound. ub: upper bound. Ref.: reference category.

Discussion

The present article investigated prosocial activities among older Finns, *i.e.* whether informal help (financial support, practical help, personal care) is associated with increased or decreased rates of volunteering and charity. The role overload hypothesis predicts that individuals are rarely willing to engage in many prosocial actions, preferring to engage in only a few (Choi *et al.*, 2007). In contrast, the role extension hypothesis argues that participating in one type of prosocial activity increases the probability of engaging in other types of prosocial activities as well (Strauss, 2021). According to our findings, a great share of older Finns are engaged in multiple prosocial activities, meaning that they provide several types of informal help to relatives or friends while participating in volunteering work or donating money to charity.

Several prior studies have indicated that older care-givers are more likely to volunteer than older non-care-givers (Burr *et al.*, 2005; Hank and Stuck, 2008; Strauss, 2021) and our findings are in line with these results. We also found that practical help and personal care given outside one's household were associated with an increased probability of volunteering. However, the provision of financial support was associated with neither an increased nor decreased likelihood of volunteering. Moreover, practical help, financial support, and care-giving to relatives or friends were not associated with an increased or decreased probability of making charitable donations.

Provision of practical help and financial support to friends was associated with an increased likelihood of both volunteering and charitable giving. Care-giving to friends also predicted an increased probability of participation in volunteering and making charitable donations. Regarding support to relatives, only the provision of care to them was associated with an increased probability of participating in volunteering. Otherwise, no statistically significant associations were detected between helping kin and volunteering or charitable giving. However, when different groups of relatives were examined separately, some significant associations were observed. Practical help to parents predicted less charitable giving, while practical help to cousins and parents' siblings predicted more charitable giving. In addition, personal care to parents was associated with a decreased likelihood of participating in charity, while caring for parents' siblings was associated with an increased likelihood of volunteering and donating money to charity. It is unclear why helping parents is associated with a decreased probability of charitable donations and volunteering, while supporting other relatives seems to promote these activities. One explanation could be that helping one's own parents is often resource-intensive, thus decreasing the possibility of engaging in other activities. Supporting more distant relatives or friends could be less demanding in terms of time and financial resources. Future studies should investigate these aspects further.

Informal help given to friends seemed to be a particularly important predictor of volunteering and charity. In line with our findings, Burr *et al.* (2005) found that care-giving to non-relatives was a particularly important predictor of volunteering among older adults from the United States of America. Our study extends these findings by examining a wider range of informal and charitable giving. Previous studies have shown that support to relatives is based on different mechanisms

than helping others outside one's household. For instance, while support between friends is typically characterised by reciprocity (Stewart-Williams, 2007; Rotkirch *et al.*, 2014), support between close kin could be more altruistic (Madsen *et al.*, 2007; Hämäläinen *et al.*, 2020b), meaning that by providing support to a friend, individuals may actually improve their chances of receiving help later.

While prior studies have examined relatives as one group consisting of all family relations or focused on particular kin relations (*e.g.* parents or children), our results show that the effect tends to vary between the type of relatives. Thus, in future studies, it is important to separate not only relatives and non-relatives but also distinguish different groups of relatives from each other.

The present study made several contributions to the field. First, we were able to study several types of informal help in the context of relatives and friends, including both time involvement and monetary support. Second, with our data, it was possible to investigate also informal financial help and charitable donations. Third, we considered practical help, financial support, and care given to relatives or friends separately, as the amount of help provided to different types of social connections and the motivation to do so may vary substantially. Another strength of our study was that we were able to control for several potential confounders, making the results more robust.

However, obviously, the study is not without limitations. Owing to data limitations, we could not consider the hours of volunteering or the amount of charitable giving. We used data from a single country, and further studies should investigate whether these results hold in other countries as well. Moreover, we cannot claim that the present findings firmly establish causality. However, a prior study that considered multiple prosocial activities found that care-giving was associated with volunteering even after unobserved heterogeneity was properly considered, providing evidence for the existence of a causal association between private and public engagement (Strauss, 2021). Finally, despite the explanatory nature of our paper, it is worth mentioning that the reported pseudo- R^2 values were relatively low (ranging from about 0.04 to 0.07). Putting aside considerations about the limitation of this measure (Allison, 2013), this may indicate a low predictive ability of our models, which might be due to a combination of factors (mis-specification of the models, omission of relevant predictors, measurement errors). Future studies may devote more attention to the predictive accuracy of models of prosocial activity in later life by using machine learning techniques and focusing on out-of-sample predictions (*see* Arpino *et al.*, 2022).

The present findings also have implications for policy and practice. Governments can support active ageing by making participation in prosocial activities more accessible for older adults, for instance, by helping with travel expenses or equipment costs. Moreover, governments could more carefully recognise the important role of older adult helpers by highlighting their role in communities, which may also help to increase older adults' social status and prevent age discrimination. From the perspective of practitioners in the field of volunteering management, it is important to note that informal help and care given to relatives and friends may complement rather than displace volunteering. Thus, when recruiting new volunteers, it is important for practitioners to recognise that older adults who provide informal help to their close ones may also have high potential to participate

in volunteering work. Finally, as engagement in multiple prosocial activities may strengthen older adults' social networks, increase their likelihood of receiving reciprocal support in the future, improve their health and wellbeing, and provide benefits for society as a whole (Musick and Wilson, 2008; Burr *et al.*, 2021), promoting their involvement in unpaid productive activities is an important goal.

Financial support. The study is part of the NetResilience consortium supported by the Strategic Research Council at the Academy of Finland (grant number 345183); and INVEST flagship supported by the Academy of Finland (grant number 320162).

Conflict of interest. The authors declare no conflicts of interest.

References

- Allison P (2013) *What's the Best R-squared for Logistic Regression*. Statistical Horizons. Available at <https://statisticalhorizons.com/r2logistic/>.
- Anderson ML (2008) Multiple inference and gender differences in the effects of early intervention: a reevaluation of the Abecedarian, Perry Preschool, and Early Training Projects. *Journal of the American Statistical Association* **103**, 1481–1495.
- Arpino B, Le Moglie M and Mencarini L (2022) What tears couples apart: an analysis of union dissolution in Germany with machine learning. *Demography* **59**, 161–186.
- Bauer TK, Brettmann J and Schmidt CM (2013) Time vs. money – the supply of voluntary labor and charitable donations across Europe. *European Journal of Political Economy* **32**, 80–94.
- Benjamini Y and Hochberg Y (1995) Controlling the false discovery rate: a practical and powerful approach to multiple testing. *Journal of the Royal Statistical Society: Series B (Methodological)* **57**, 289–300.
- Benjamini Y, Krieger AM and Yekutieli D (2006) Adaptive linear step-up procedures that control the false discovery rate. *Biometrika* **93**, 491–507.
- Burr JA, Choi NG, Mutchler JE and Caro FG (2005) Caregiving and volunteering: are private and public helping behaviors linked? *Journals of Gerontology: Series B* **60**, S247–S256.
- Burr JA, Mutchler JE and Han SH (2021) Volunteering and health in later life. In Ferraro K and Carr D (eds), *Handbook of Aging and the Social Sciences*. San Diego, CA: Academic Press, pp. 303–319.
- Choi NG, Burr JA, Mutchler JE and Caro FG (2007) Formal and informal volunteer activity and spousal caregiving among older adults. *Research on Aging* **29**, 99–124.
- Foster L and Walker A (2015) Active and successful aging: a European policy perspective. *The Gerontologist* **55**, 83–90.
- Hämäläinen H and Tanskanen AO (2021) 'Sandwich generation': generational transfers towards adult children and elderly parents. *Journal of Family Studies* **27**, 336–355.
- Hämäläinen H, Tanskanen AO and Danielsbacka M (2020a) Vapaaehtoistyö ja hyväntekeväisyys [Volunteering and charity]. In Danielsbacka M, Hämäläinen H and Tanskanen AO (eds), *Suomalainen auttaminen [Informal Help in Finland]*. Helsinki: Gaudeamus, pp. 182–195.
- Hämäläinen H, Tanskanen AO, Danielsbacka M and Arpino B (2020b) Short-term reciprocity between adult children and parents: a within-person investigation of longitudinal data. *Advances in Life Course Research* **44**, 1–13.
- Hämäläinen H, Danielsbacka M, Hägglund AE, Rotkirch A and ja Tanskanen AO (2021) Sukupolvien suhteet. Ikääntyminen ja vuorovaikutuksen muutos suurten ikäluokkien ja aikuisten lasten elämäntilanteissa [Intergenerational Relations. Aging and Change of Interactions in the Life Course of Finnish Baby Boomers and Their Adult Children]. Helsinki: Väestöliitto.
- Hank K and Erlinghagen M (2010) Dynamics of volunteering in older Europeans. *The Gerontologist* **50**, 170–178.
- Hank K and Stuck S (2008) Volunteer work, informal help, and care among the 50+ in Europe: further evidence for 'linked' productive activities at older ages. *Social Science Research* **37**, 1280–1291.
- Jacobs MT, Broese van Groenou MI, Aartsen MJ and Deeg DJH (2016) Diversity in older adults' care networks: the added value of individual beliefs and social network proximity. *Journals of Gerontology: Series B* **73**, 326–336.

- Jegermalm M and Jeppsson Grassman E** (2009) Caregiving and volunteering among older people in Sweden prevalence and profiles. *Journal of Aging & Social Policy* **21**, 352–373.
- Jegermalm M and Jeppsson Grassman E** (2013) Links between informal caregiving and volunteering in Sweden: a 17-year perspective. *European Journal of Social Work* **16**, 205–219.
- Linlin Y** (2021) ggvenn: draw Venn diagram by 'ggplot2'. R package version 0.1.9. Available at <https://CRAN.R-project.org/package=ggvenn>.
- Madsen EA, Tunney RJ, Fieldman G, Plotkin HC, Dunbar RIM, Richardson JM and McFarland D** (2007) Kinship and altruism: a cross-cultural experimental study. *British Journal of Psychology* **98**, 339–359.
- McFadden DL** (1974) Conditional logit analysis of qualitative choice behavior. In Zarembka P (ed.), *Frontiers in Econometrics*. New York, NY: Academic Press, pp. 105–142.
- Musick MA and Wilson J** (2008) *Volunteers: A Social Profile*. Bloomington, IN: Indiana University Press.
- Organisation for Economic Co-operation and Development** (2021a) *Population*. Available at <https://doi.org/10.1787/d434f82b-en>.
- Organisation for Economic Co-operation and Development** (2021b) *Social Benefits to Households*. Available at <https://doi.org/10.1787/423105c6-en>.
- Rotkirch A, Lyons M, David-Barrett T and Jokela M** (2014) Gratitude for help among adult friends and siblings. *Evolutionary Psychology* **12**, 673–686.
- Stewart-Williams S** (2007) Altruism among kin vs. nonkin: effects of cost of help and reciprocal exchange. *Evolution and Human Behavior* **28**, 193–198.
- Strauss S** (2021) Multiple engagement: the relationship between informal care-giving and formal volunteering among Europe's 50+ population. *Ageing & Society* **41**, 1562–1586.
- Tanskanen AO and Danielsbacka M** (2019) *Intergenerational Family Relations: An Evolutionary Social Science Approach*. London: Routledge.
- World Health Organization** (2015) *World Report on Ageing and Health*. Geneva: World Health Organization.

Cite this article: Tanskanen AO, Hämäläinen H, Arpino B, Danielsbacka M (2024). Prosocial activity in later life: are informal help and care associated with volunteering and charity? *Ageing & Society* **44**, 1645–1680. <https://doi.org/10.1017/S0144686X22001015>

Appendix

Table A1. Predicting volunteering and charitable giving by practical help and/or care to relatives and friends

	Volunteering												Charity											
	Unadjusted						Adjusted						Unadjusted						Adjusted					
					95% CI						95% CI						95% CI						95% CI	
	OR	SE	p	q	lb	ub	OR	SE	p	q	lb	ub	OR	SE	p	q	lb	ub	OR	SE	p	q	lb	ub
Help to relatives:																								
No help	Ref.						Ref.						Ref.						Ref.					
Helping one group	1.25	0.17	0.099	0.058	0.96	1.62	1.11	0.15	0.436	0.182	0.85	1.46	1.24	0.13	0.040	0.030	1.01	1.52	1.02	0.11	0.869	0.319	0.82	1.26
Helping two groups	1.52	0.24	0.007	0.009	1.12	2.07	1.21	0.20	0.247	0.124	0.88	1.68	1.55	0.20	0.001	0.003	1.20	1.99	1.12	0.15	0.402	0.173	0.86	1.47
Helping three groups	2.30	0.44	0.000	0.001	1.58	3.35	1.82	0.37	0.003	0.005	1.22	2.71	1.86	0.33	0.000	0.001	1.32	2.64	1.33	0.25	0.129	0.071	0.92	1.92
Helping over three groups	2.53	0.62	0.000	0.001	1.56	4.10	1.63	0.43	0.064	0.043	0.97	2.74	2.09	0.51	0.003	0.005	1.30	3.36	1.29	0.33	0.319	0.146	0.78	2.14
Help to friends:																								
No help	Ref.						Ref.						Ref.						Ref.					
One type of help	1.88	0.23	0.000	0.001	1.48	2.40	1.71	0.22	0.000	0.001	1.33	2.21	1.57	0.17	0.000	0.001	1.27	1.95	1.51	0.18	0.000	0.001	1.20	1.91
Two types of help	4.22	0.74	0.000	0.001	2.99	5.95	4.00	0.73	0.000	0.001	2.79	5.73	1.51	0.27	0.020	0.018	1.07	2.13	1.61	0.30	0.011	0.012	1.12	2.33
Gender:																								
Female							Ref.												Ref.					
Male							0.64	0.07	0.000	0.001	0.51	0.81							0.65	0.06	0.000	0.001	0.54	0.78
Partnership status:																								
No partner/spouse							Ref.												Ref.					
Has a partner/spouse							0.96	0.12	0.727	0.281	0.74	1.23							1.60	0.17	0.000	0.001	1.30	1.98

Education:													
Primary or lower secondary level	Ref.							Ref.					
Upper secondary level	1.28	0.17	0.059	0.040	0.99	1.66		1.35	0.14	0.003	0.005	1.11	1.65
Lower degree-level tertiary education	1.86	0.41	0.005	0.007	1.21	2.85		2.06	0.43	0.001	0.003	1.36	3.11
Higher degree-level tertiary education	1.67	0.34	0.012	0.013	1.12	2.50		2.02	0.37	0.000	0.001	1.41	2.90
Employment status:													
Not working	Ref.							Ref.					
Working	0.70	0.11	0.022	0.020	0.52	0.95		0.96	0.12	0.743	0.288	0.75	1.23
Financial condition:													
Low income	Ref.							Ref.					
Middle income	1.04	0.13	0.750	0.289	0.81	1.34		1.36	0.14	0.003	0.005	1.11	1.67
At least comfortably off	1.26	0.21	0.176	0.093	0.90	1.75		1.77	0.26	0.000	0.001	1.32	2.36
Self-rated health:													
Poor or very poor	Ref.							Ref.					
Fair	1.17	0.30	0.536	0.217	0.71	1.93		1.55	0.31	0.029	0.024	1.05	2.30
Good	1.03	0.27	0.916	0.328	0.62	1.71		1.75	0.36	0.006	0.008	1.17	2.61
Very good	1.27	0.38	0.429	0.179	0.70	2.29		1.31	0.32	0.275	0.132	0.81	2.12
Number of relatives	1.03	0.01	0.011	0.012	1.01	1.05		1.05	0.01	0.000	0.001	1.03	1.07
Number of friends	1.04	0.01	0.003	0.005	1.01	1.07		0.99	0.01	0.338	0.153	0.96	1.01
Pseudo R^2	0.07							0.06					

Notes: Logistic regression (N = 2,184). OR: odds ratio. SE: standard error. q : sharpened q -value. CI: confidence interval. lb: lower bound. ub: upper bound. Ref.: reference category.

Table A2. Predicting volunteering and charitable giving by practical help given to relatives and friends

	Volunteering												Charity											
	Unadjusted						Adjusted						Unadjusted						Adjusted					
	95% CI						95% CI						95% CI						95% CI					
	OR	SE	<i>p</i>	<i>q</i>	lb	ub	OR	SE	<i>p</i>	<i>q</i>	lb	ub	OR	SE	<i>p</i>	<i>q</i>	lb	ub	OR	SE	<i>p</i>	<i>q</i>	lb	ub
Help to children:																								
No	Ref.						Ref.						Ref.						Ref.					
Yes	1.36	0.14	0.004	0.006	1.11	1.67	1.24	0.14	0.061	0.041	0.99	1.54	1.47	0.13	0.000	0.001	1.24	1.75	1.17	0.11	0.098	0.058	0.97	1.41
Help to parents:																								
No	Ref.						Ref.						Ref.						Ref.					
Yes	1.13	0.16	0.374	0.164	0.86	1.50	1.00	0.15	0.982	0.481	0.75	1.34	0.82	0.10	0.086	0.052	0.65	1.03	0.62	0.08	0.000	0.001	0.49	0.80
Help to siblings:																								
No	Ref.						Ref.						Ref.						Ref.					
Yes	1.34	0.17	0.021	0.019	1.04	1.72	1.12	0.15	0.401	0.173	0.86	1.46	1.37	0.15	0.005	0.007	1.10	1.71	1.17	0.14	0.191	0.100	0.92	1.48
Help to aunts/uncles:																								
No	Ref.						Ref.						Ref.						Ref.					
Yes	1.74	0.40	0.017	0.016	1.11	2.73	1.40	0.35	0.177	0.093	0.86	2.28	2.26	0.55	0.001	0.003	1.40	3.65	1.69	0.44	0.046	0.034	1.01	2.82
Help to cousins:																								
No	Ref.						Ref.						Ref.						Ref.					
Yes	1.37	0.32	0.184	0.097	0.86	2.17	0.88	0.23	0.619	0.246	0.53	1.46	2.29	0.55	0.001	0.003	1.43	3.67	1.76	0.46	0.032	0.025	1.05	2.93
Help to friends:																								

No	Ref.						Ref.						Ref.						Ref.					
Yes	2.03	0.23	0.000	0.001	1.63	2.52	1.94	0.23	0.000	0.001	1.53	2.45	1.55	0.16	0.000	0.001	1.27	1.89	1.44	0.16	0.001	0.003	1.15	1.79
Gender:																								
Female							Ref.												Ref.					
Male							0.61	0.07	0.000	0.001	0.49	0.77							0.62	0.06	0.000	0.001	0.52	0.75
Partnership status:																								
No partner/spouse							Ref.												Ref.					
Has a partner/spouse							0.91	0.12	0.444	0.184	0.70	1.17							1.56	0.17	0.000	0.001	1.26	1.94
Education																								
Primary or lower secondary level							Ref.												Ref.					
Upper secondary level							1.29	0.17	0.050	0.036	1.00	1.66							1.38	0.14	0.002	0.004	1.13	1.68
Lower degree-level tertiary education							1.91	0.41	0.003	0.005	1.25	2.92							2.18	0.46	0.000	0.001	1.44	3.31
Higher degree-level tertiary education							1.67	0.34	0.012	0.013	1.12	2.49							2.13	0.40	0.000	0.001	1.48	3.07
Employment status:																								
Not working							Ref.												Ref.					
Working							0.71	0.11	0.025	0.022	0.52	0.96							0.97	0.12	0.831	0.316	0.76	1.24
Financial condition:																								
Low income							Ref.												Ref.					
Middle income							1.04	0.13	0.774	0.296	0.81	1.33							1.37	0.14	0.003	0.005	1.12	1.69
At least comfortably off							1.23	0.20	0.222	0.113	0.88	1.70							1.78	0.26	0.000	0.001	1.33	2.38
Self-rated health:																								

(Continued)

Table A2. (Continued.)

	Volunteering												Charity											
	Unadjusted						Adjusted						Unadjusted						Adjusted					
	95% CI												95% CI						95% CI					
	OR	SE	<i>p</i>	<i>q</i>	lb	ub	OR	SE	<i>p</i>	<i>q</i>	lb	ub	OR	SE	<i>p</i>	<i>q</i>	lb	ub	OR	SE	<i>p</i>	<i>q</i>	lb	ub
Poor or very poor	Ref.												Ref.											
Fair	1.15 0.29 0.580 0.232 0.70 1.88												1.59 0.32 0.022 0.020 1.07 2.36											
Good	0.99 0.25 0.966 0.342 0.60 1.63												1.77 0.37 0.005 0.007 1.18 2.66											
Very good	1.18 0.35 0.587 0.233 0.66 2.10												1.30 0.32 0.290 0.136 0.80 2.11											
Number of relatives	1.03 0.01 0.013 0.013 1.01 1.05												1.05 0.01 0.000 0.001 1.03 1.08											
Number of friends	1.04 0.01 0.004 0.006 1.01 1.07												0.98 0.01 0.217 0.110 0.96 1.01											
Pseudo <i>R</i> ²	0.050												0.072											

Notes: Logistic regression (N = 2,184). OR: odds ratio. SE: standard error. *q*: sharpened *q*-value. CI: confidence interval. lb: lower bound. ub: upper bound. Ref.: reference category.

Table A3. Predicting volunteering and charitable giving by financial support given to relatives and friends

	Volunteering												Charity											
	Unadjusted						Adjusted						Unadjusted						Adjusted					
	OR	SE	p	q	lb	ub	OR	SE	p	q	lb	ub	OR	SE	p	q	lb	ub	OR	SE	p	q	lb	ub
Support to children:																								
No	Ref.						Ref.						Ref.						Ref.					
Yes	1.31	0.14	0.010	0.011	1.07	1.61	1.22	0.14	0.075	0.048	0.98	1.52	1.41	0.13	0.000	0.001	1.19	1.69	1.14	0.11	0.178	0.094	0.94	1.37
Support to parents:																								
No	Ref.						Ref.						Ref.						Ref.					
Yes	0.89	0.38	0.775	0.296	0.39	2.03	0.72	0.31	0.444	0.184	0.30	1.69	1.30	0.45	0.459	0.189	0.65	2.57	0.91	0.34	0.795	0.299	0.44	1.88
Support to other kin:																								
No	Ref.						Ref.						Ref.						Ref.					
Yes	1.09	0.28	0.754	0.290	0.65	1.81	0.80	0.22	0.424	0.178	0.46	1.39	1.78	0.42	0.016	0.015	1.12	2.83	1.56	0.39	0.076	0.048	0.95	2.57
Support to friends:																								
No	Ref.						Ref.						Ref.						Ref.					
Yes	3.70	1.02	0.000	0.001	2.16	6.35	3.61	1.05	0.000	0.001	2.04	6.38	2.40	0.77	0.006	0.008	1.28	4.50	2.55	0.85	0.005	0.007	1.33	4.92
Gender:																								
Female							Ref.												Ref.					
Male							0.68	0.08	0.001	0.003	0.54	0.85							0.67	0.06	0.000	0.001	0.56	0.81
Partnership status:																								

(Continued)

Table A3. (Continued.)

	Volunteering												Charity											
	Unadjusted						Adjusted						Unadjusted						Adjusted					
	95% CI						95% CI						95% CI						95% CI					
	OR	SE	p	q	lb	ub	OR	SE	p	q	lb	ub	OR	SE	p	q	lb	ub	OR	SE	p	q	lb	ub
No partner/spouse							Ref.												Ref.					
Has a partner/spouse							0.89	0.11	0.346	0.155	0.69	1.14							1.58	0.17	0.000	0.001	1.28	1.95
Education:																								
Primary or lower secondary level							Ref.												Ref.					
Upper secondary level							1.33	0.17	0.027	0.022	1.03	1.72							1.38	0.14	0.002	0.004	1.13	1.68
Lower degree-level tertiary education							2.10	0.45	0.001	0.003	1.38	3.21							2.18	0.46	0.000	0.001	1.44	3.29
Higher degree-level tertiary education							1.77	0.36	0.005	0.007	1.19	2.64							2.06	0.38	0.000	0.001	1.44	2.95
Employment status:																								
Not working							Ref.												Ref.					
Working							0.70	0.11	0.023	0.020	0.52	0.95							0.95	0.12	0.685	0.268	0.75	1.21
Financial condition:																								
Low income							Ref.												Ref.					
Middle income							1.05	0.13	0.683	0.268	0.82	1.35							1.36	0.14	0.003	0.005	1.11	1.67
At least comfortably off							1.22	0.20	0.227	0.115	0.88	1.70							1.71	0.25	0.000	0.001	1.28	2.28
Self-rated health:																								

Poor or very poor	Ref.							Ref.						
Fair	1.17	0.30	0.527	0.215	0.72	1.93		1.54	0.31	0.031	0.025	1.04	2.28	
Good	1.03	0.27	0.899	0.321	0.62	1.71		1.74	0.36	0.007	0.009	1.17	2.60	
Very good	1.22	0.36	0.506	0.208	0.68	2.18		1.28	0.32	0.307	0.143	0.79	2.08	
Number of relatives	1.03	0.01	0.004	0.006	1.01	1.06		1.06	0.01	0.000	0.001	1.04	1.08	
Number of friends	1.04	0.01	0.003	0.005	1.01	1.07		0.99	0.01	0.415	0.176	0.97	1.01	
Pseudo R^2	0.042							0.061						

Notes: Logistic regression (N = 2,184). OR: odds ratio. SE: standard error. *q*: sharpened *q*-value. CI: confidence interval. lb: lower bound. ub: upper bound. Ref.: reference category.

Table A4. Predicting volunteering and charitable giving by care given to relatives and friends

	Volunteering												Charity											
	Unadjusted						Adjusted						Unadjusted						Adjusted					
	95% CI						95% CI						95% CI						95% CI					
	OR	SE	<i>p</i>	<i>q</i>	lb	ub	OR	SE	<i>p</i>	<i>q</i>	lb	ub	OR	SE	<i>p</i>	<i>q</i>	lb	ub	OR	SE	<i>p</i>	<i>q</i>	lb	ub
Care to parents:																								
No	Ref.						Ref.						Ref.						Ref.					
Yes	1.47	0.23	0.013	0.013	1.08	2.00	1.28	0.21	0.142	0.078	0.92	1.77	0.96	0.13	0.791	0.299	0.73	1.27	0.74	0.11	0.039	0.029	0.55	0.98
Care to siblings:																								
No	Ref.						Ref.						Ref.						Ref.					
Yes	1.74	0.37	0.009	0.010	1.15	2.65	1.52	0.35	0.068	0.045	0.97	2.38	1.55	0.33	0.036	0.027	1.03	2.35	1.45	0.32	0.095	0.057	0.94	2.23
Care to aunts/uncles:																								
No	Ref.						Ref.						Ref.						Ref.					
Yes	3.32	0.83	0.000	0.001	2.03	5.43	2.39	0.65	0.001	0.003	1.41	4.07	3.45	1.11	0.000	0.001	1.84	6.48	2.87	0.96	0.002	0.004	1.50	5.51
Care to cousins:																								
No	Ref.						Ref.						Ref.						Ref.					
Yes	2.09	0.88	0.079	0.049	0.92	4.76	0.73	0.34	0.509	0.209	0.29	1.84	3.88	2.12	0.013	0.013	1.33	11.33	2.93	1.68	0.062	0.042	0.95	9.04
Care to friends:																								
No	Ref.						Ref.						Ref.						Ref.					
Yes	3.87	0.58	0.000	0.001	2.88	5.20	3.69	0.60	0.000	0.001	2.69	5.06	1.37	0.21	0.040	0.030	1.01	1.84	1.31	0.22	0.096	0.057	0.95	1.81

Gender:													
Female	Ref.						Ref.						
Male	0.74	0.09	0.011	0.012	0.59	0.93	0.69	0.07	0.000	0.001	0.57	0.83	
Partnership status:													
No partner/spouse	Ref.						Ref.						
Has a partner/spouse	0.93	0.12	0.562	0.225	0.72	1.19	1.56	0.17	0.000	0.001	1.26	1.92	
Education:													
Primary or lower secondary level	Ref.						Ref.						
Upper secondary level	1.32	0.17	0.036	0.027	1.02	1.70	1.41	0.14	0.001	0.003	1.16	1.72	
Lower degree-level tertiary education	2.08	0.46	0.001	0.003	1.36	3.20	2.24	0.47	0.000	0.001	1.48	3.38	
Higher degree-level tertiary education	1.83	0.38	0.003	0.005	1.22	2.74	2.18	0.40	0.000	0.001	1.52	3.12	
Employment status:													
Not working	Ref.						Ref.						
Working	0.71	0.11	0.027	0.022	0.52	0.96	0.97	0.12	0.791	0.299	0.76	1.23	
Financial condition:													
Low income	Ref.						Ref.						
Middle income	1.07	0.14	0.587	0.233	0.83	1.38	1.37	0.14	0.002	0.004	1.12	1.68	
At least comfortably off	1.28	0.22	0.144	0.078	0.92	1.79	1.80	0.27	0.000	0.001	1.35	2.41	
Self-rated health:													
Poor or very poor	Ref.						Ref.						

(Continued)

Table A4. (Continued.)

	Volunteering												Charity											
	Unadjusted						Adjusted						Unadjusted						Adjusted					
	95% CI						95% CI						95% CI						95% CI					
	OR	SE	<i>p</i>	<i>q</i>	lb	ub	OR	SE	<i>p</i>	<i>q</i>	lb	ub	OR	SE	<i>p</i>	<i>q</i>	lb	ub	OR	SE	<i>p</i>	<i>q</i>	lb	ub
Fair						1.17	0.30	0.529	0.215	0.71	1.94							1.60	0.32	0.019	0.018	1.08	2.37	
Good						1.05	0.27	0.848	0.319	0.63	1.75							1.78	0.37	0.005	0.007	1.19	2.66	
Very good						1.31	0.39	0.369	0.162	0.73	2.36							1.33	0.33	0.251	0.124	0.82	2.15	
Number of relatives						1.03	0.01	0.006	0.008	1.01	1.05							1.06	0.01	0.000	0.001	1.03	1.08	
Number of friends						1.04	0.01	0.003	0.005	1.01	1.07							0.99	0.01	0.330	0.150	0.96	1.01	
Pseudo <i>R</i> ²						0.071												0.065						

Notes: Logistic regression (N = 2,184). OR: odds ratio. SE: standard error. *q*: sharpened *q*-value. CI: confidence interval. lb: lower bound. ub: upper bound. Ref.: reference category.