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Research Article

**Life after death: Widowhood and volunteering
gendered pathways among older adults**

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Life after death: Widowhood and volunteering gendered pathways among older adults

Danilo Bolano¹

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Abstract

BACKGROUND

Spousal loss is one of the most traumatic events an individual can experience. Studies on behavioral changes before and after this event are scarce.

OBJECTIVE

This study investigates gender differences in pathways of volunteering before and after transition to widowhood among older adults in the United States.

METHODS

We use longitudinal data from the Health and Retirement Study and estimate fixed effects models with lags and leads to identify pathways of volunteering on a sample of 1,982 adults aged 50 and over.

RESULTS

The results show a U-shaped pattern with a decline in volunteering activities before the death of the partner and then a slight process of adaptation and recovery. The process is strongly gendered, with women considerably more resilient than men. Whether death was expected or not influences the effect of the partner's death on volunteering, likely due to the pre-death burden of caregiving. Looking at the role of the partner's volunteering before death, we found for both genders, but especially for women, that the odds of volunteering increase (decrease) if the partner was (was not) volunteering (complementarity hypothesis).

CONTRIBUTION

Given the positive effects of volunteering both for the volunteer and the society as a whole, our findings contribute to the literature highlighting that critical family events may affect participation in society of older people and demonstrating the heterogeneity of the effects, especially in terms of gender differences.

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1. Introduction

The death of the spouse is one of the most traumatic events in the life course of an individual. Based on data from the American Community Survey, the US Census Bureau estimated that more than 15 million widows and widowers were living in the United States in 2017. Every year, about 1.4 million people in the United States experience this traumatic event (US Census Bureau 2017a, 2017b).

Most studies about widowhood have focused on the physiological and psychological effects of the partner's loss (e.g., Strobe, Strobe, and Schut 2001) and on the coping strategies to reduce negative consequences on mental health (e.g., Gumà and Fernández-Carro 2019). Losing a spouse is associated with increasing risk of death, higher levels of physiological and mental distress, and onset of depressive symptoms (Carr and Utz 2002; Heinemann and Evans 1990). Behavioral changes in response to widowhood have received less attention. By using longitudinal data from the Health and Retirement Study (HRS) and fixed effects models with lags and leads, this study analyzes the gendered trajectories of engagement in volunteering activities before and after spousal loss for individuals who experienced this event after the age of 50.

Volunteering is an important form of formal social participation across all stages of the life course (Lancee and Radl 2014; Wilson 2012). It produces positive benefits for both the volunteer and the society as a whole. Among older adults, the benefits of volunteering have been theorized as part of more general models of aging, such as successful, active, or productive aging (Gottlieb and Gillespie 2008). Active engagement in social activities, such as volunteering, contributes to slowing down the process of cognitive decline and plays a decisive role in influencing life satisfaction, health, functioning, autonomy, and survival (e.g., Carr, Fried, and Rowe 2015; Engelhardt et al. 2010; Hultsch et al. 1999). Volunteering may also increase social networks and give a sense of purpose in life (Thoits 2012).

Few studies exist on the effects of widowhood on volunteering or other forms of social participation. Either these studies have used cross-section surveys comparing widowed and nonwidowed individuals or they relied on short prospective studies looking at two time points (before and after the partner's death). Drawing on longitudinal data from HRS, the current study contributes to this literature by examining the trajectories of volunteering activities potentially over almost 20 years on a sample of individuals aged 50 and over who lost their spouse ($N = 1,982$). Thanks to the longitudinal nature of the data and the analytic approach applied in this study (longitudinal fixed effects models with lags and leads), we are able to identify processes of adaptation and recovery after widowhood. We are also able to control for unobserved time-invariant potential confounders, and given the longer observation period as compared to other studies, we are able to observe a higher number of transitions to

widowhood. Finally, we are also able to observe anticipation effects prior to the partner's loss.

We argue that women and men may experience the process of adaptation to and recovering from widowhood differently. Therefore, we examine differences in the effect of spousal loss on volunteering separately by gender. We further stratify the analyses considering two additional factors that, to the best of our knowledge, have not been considered so far in the context of reaction of spousal loss and behavioral changes: death expectedness and whether the partner was engaged in volunteering prior to death.

2. Background

2.1 Consequences of widowhood in later life

The death of one's spouse is one of the most critical negative events a person might experience (Amster and Krauss 1974; Atchley 1975; Stroebe and Stroebe 1995). This event brings negative physical, mental, and economic consequences (Hungerford 2001; Wilcox et al. 2003). It implies a loss in terms of resources, both instrumental and immaterial (companionship, emotional support) but also a loss of an intimate relationship and of a desirable social position (Stroebe, Stroebe, and Schut 2001).

The adaptation model is one of the theoretical frameworks that has been used to conceptualize the consequences of widowhood, especially in terms of subjective well-being (SWB). The adaptation model argues that after a life event (either positive, like marriage or having a child, or negative, like spouse death or losing a job) there is a reaction phase with significant changes in SWB with respect to the baseline level. This phase is followed by an adaptation phase in which individuals adapt to the new circumstances and their SWB tends to return to the normal (pre-event) level (see the seminal work of Brickman and Campbell 1971). It has been argued that this adaptation process protects people from potentially dangerous psychological and physiological consequences of prolonged emotional states and also helps individuals to focus on new life events rather than past ones (Frederick and Loewenstein 1999).

Traditional adaptation models suggest that people can adapt to almost any life event and that SWB levels fluctuate around a biologically determined 'set point.' Although evidence shows that some adaptation to life events certainly occurs, events such as death of a spouse are associated with lasting changes in SWB. The extent to which individuals adapt to life events depends on individual characteristics. Research has shown that the impact of bereavement on well-being is particularly strong right after the event and the adaption takes longer than other disruptive events, such as divorce (see the review by Luhmann et al. 2012 on 22 longitudinal studies on

bereavement). Past studies also find widowhood to have long-lasting negative effects on health. Common documented symptoms include anxiety and depression as well as physical symptoms of pain, gastrointestinal problems, high blood pressure, and circulatory issues (Kowalski and Bondmass 2008). According to the adaptation model, we would expect a reduced probability of engagement in volunteering right after the partner's death followed by an increased probability of volunteering as the time from this event goes by.

The stress and coping models (Pearlin and Schooler 1978; Pearlin et al. 1981; Wheaton 1985) also offer theoretical foundations to widowhood studies with predictions similar to those of the adaptation model. These models posit that the strain suffered after an event such as widowhood are the strongest immediately after the partner's death but are likely to diminish with time due to coping processes. Increasing contact with family members, friends, and neighbors, either by phone or in person, can be a strategy to cope with the loss, providing both emotional support and assistance with practical needs and thus reducing the negative consequences of losing a partner (Carr et al. 2018; Gumà and Fernández-Carro 2019). Volunteering, and social engagement in general, can also be used as a coping strategy put forward to alleviate the stress and reduced support due to losing a partner. Volunteer participation reduces stress because it contributes to positive emotions (Pillemer and Glasgow 2000) and facilitates social support and social interactions (Musick and Wilson 2007).

If volunteering is used as a coping strategy, we would then expect a higher probability of engagement in this activity after the transition to widowhood as compared to before this event. However, the ability and willingness to use volunteering as a coping strategy may not be homogeneous across the whole population. We focus, in particular, on gender differences.

2.2 Gender differences

Widowhood is a multifaceted transition (Carr and Utz 2002). Variability in the timing and speed of recovery after a loss has been observed in literature (Bennett 2010a; Bonanno, Westphal, and Mancini 2011). In particular, men and women have been found to react differently to widowhood.

In their review, Stroebe, Stroebe, and Schut (2001) find that men suffer more from widowhood with respect to health and social relations. They argue that women have more confrontative and expressive coping styles than men, which may be protective. Similarly, in terms of changes in SWB after spousal death, Luhman et al. (2012) find a significant moderating effect of gender, with women adapting faster than men to widowhood.

Several studies have also demonstrated gender differences in social support and interaction that are known to influence coping. For example, Peters and Liefbroer (1997) find that widowers receive less social support than widows. Having a strong support network is an effective coping strategy (Anderson 1983; Bankoff 1983). Older women often tend to have a larger network of social support than men, whereas men tend to rely more on their spouse as source of emotional and physical support (Antonucci and Akiyama 1987). It has been also hypothesized that because women are more capable of creating intimate relationships than men, they would also be able to create new social relations after spousal loss faster than men to help them in coping with the loss (Hatch and Bulcroft 1992). These might contribute to explaining the quicker adaptation to spousal loss among women.

Gender-specific roles in the family might explain the differences in reaction to spousal loss as well. According to Bennet (2010b), the process following bereavement might create a new 'augmented' identity not simply as widow but as 'wife/widow' keeping strong bonds with the deceased. Increasing contact with relatives and friends (i.e., informal social participation) after a partner's death, or engagement in social activities, might be a way to reconstruct one's own identity as an individual in society. Widowers instead tend to reconstruct their identity within the framework of 'hegemonic masculinity.' While facing challenges, both practical and emotional, recently widowed men might tend to repress their feelings and emotions, at least in public (Bennet 2007, 2010b). Traditional gender division of housework increases spousal dependence among men, making them less prepared for widowhood. Losing a spouse might then be less disruptive in the daily routine for a woman than for a man.

Given the previous discussion, we will stratify our analyses by gender and expect women's volunteering to be less affected by widowhood. More specifically, because among those who experience the loss of a partner, women as compared to men are likely to suffer less in terms of stress and support and more likely to use social participation as a coping strategy, we expect women's likelihood of volunteering to return to pre-widowhood levels quicker than for men.

2.3 Death expectedness

The gendered effects of widowhood may also be related to death expectedness (i.e., whether widowhood was experienced as a gradual and anticipated loss or instead as an unforeseen event). In the literature, there is no agreement regarding whether sudden and unexpected deaths are more difficult to cope with as compared to gradual and anticipated deaths (e.g., Carr and Utz 2002; Carr et al. 2001; O'Bryant 1990–1991). Some studies suggest that it is more difficult to cope with a sudden death since the

couple did not have time to solve ‘unfinished business’ (e.g., Holland et al. 2014; Steinhauer et al. 2000). Along this line, the stress models posit that predictable life transitions are presumed to be less stressful than unexpected ones (George 1993; Pearlin 1982).

However, widowhood is often more a process than a definite transition out of marriage, especially if it happens later in life. The process of becoming a widow or widower might start years before the event with onset of illness or health deterioration of the partner. The burden of caregiving is associated with physical and mental distress for the caregiver (Pinquart and Sorensen 2003; Vitaliano, Scanlon, and Zhang 2003), and women are more likely to report higher negative effects due to caregiving than men (Yee and Schultz 2000). Spouses who spend prolonged periods anticipating their spouse’s death are likely to be at a greater risk of experiencing concurrent stressors than those who do not anticipate their partner’s death (Carr et al. 2001). Spousal death might also produce a relief to the burden of caregiving, and this might partially mitigate the negative effects associated with spousal loss. For example, Schaan (2013) finds that widowhood had a smaller effect on increased symptoms of depression for people who were providing care to their partner.

Because women are more likely to provide informal care (Wolff and Kasper 2006), we anticipate a stronger effect of death expectedness on women’s volunteering. More specifically, prior to the spouse’s death, we predict death expectedness to be associated with a reduced likelihood of volunteering, especially among women. After the transition to widowhood, death expectedness is anticipated to be associated with an increased probability of volunteering, again especially for women.

2.4 Partner’s pre-death volunteering

Gender differences in the effect of widowhood on volunteering may also arise because of gendered dynamics in a partner’s influence on engagement in volunteering.

The substitution hypothesis posits that partners allocate their time to different activities according to the specialization principle (Becker 1991; Baker and Jacobsen 2007). Therefore, if a partner invests his/her time in volunteering, the other is likely to invest in other activities. Thus, we would expect a negative relationship between partners volunteering. On the other hand, the complementary hypothesis argues that partners tend to coordinate their activities to increase time spent together (Hallberg 2003; Sullivan 1996). Partners also tend to be similar in terms of personality, values, etc. (Luo 2017), thus making it more likely that they share interests and do similar activities. Therefore, the complementary hypothesis predicts a positive relationship between partners volunteering. According to Rotolo and Wilson (2006), most of the

studies on spousal influence in volunteering support the complementarity hypothesis. Moreover, the authors' analyses show that women's engagement in volunteering has a stronger effect on their partner's volunteering than the other way around.

However, to the best of our knowledge there is no test of this theory in the context of transition to widowhood. Complementary theory implies that one's likelihood of volunteering is higher (lower) when the partner is (is not) engaged in this activity. What should we expect then about changes over the transition to widowhood? Before a partner's death we would expect complementarity to be stronger because, for example, the partners' aspiration to spend time together (either doing volunteer work or not) may be higher. After a partner's death, complementarity implies an inverted effect on the survivor's likelihood of volunteering: pre-death volunteering with the partner may result in a reduced engagement after death and vice versa. This effect is expected to be stronger for men. Women tend to be 'kin keepers' and men's link to social ties and activities outside the home. Men who are widowed may lose that connection to their volunteering activities.

2.5 Previous studies on widowhood and volunteering, and our contribution

There is a paucity of longitudinal studies on the consequences of widowhood on volunteering. Utz et al. (2002) compare widowed persons to continuously married ones in terms of changes experienced in social participation over a six-month period. Using a sample of 297 individuals from the Changing Lives of Older Couples studies, the authors find an increase in informal social participation (frequency of contacts, either in person or by phone, with friends, neighbors, and relatives) after spousal loss, among women in particular. However, no effect was found on formal social participation (i.e., participation in religious services and meetings in clubs or associations). The authors use continuously married respondents as a sort of control group, but they could not include pre-loss propensity of volunteering since the first wave of data collection for the widowed started only after spousal loss. Moreover, gender differences were not directly analyzed.

While this study from Utz et al. (2002) does not differentiate between volunteering and other forms of social participation, Li (2007) examines, among other things, volunteering participation of widows and continuously married individuals. Using data from the Americans' Changing Lives (ACL) survey, the author is able to identify 201 individuals who experienced the transition to widowhood during the observation period. The study considers only two time points with a quite large interperiod range (potentially up to eight years). The author finds that compared to their continually married counterparts, people who experienced spousal loss between the two waves

reported greater likelihood of volunteering. However, given data limitations, the author could not precisely measure the time elapsed from partner's death. Moreover, the author, despite including the effect of engagement on volunteering at time 1 on volunteering at time 2, does not distinguish the effects between newly widowed and married respondents. Thus, the propensity of volunteering pre- versus post-bereavement engagement is not directly tested in the study. As in the Utz and colleagues study mentioned above, gender is included only as a control variable and gender differences in volunteering engagement in response to spousal loss are not discussed.

Donnelly and Hinterlong (2009) reanalyze both of the previously mentioned studies. The authors construct a synthetic cohort of 228 recently widowed individuals aged 60 years and older and compared them with random, nonwidowed older adult controls ($n = 228$) across three waves of ACL data. Widowhood was defined as the experience of partner's death within three years preceding the interview. Differently from Li (2007), Donnelly and Hinterlong (2009) find no significant effect on either formal or informal volunteering. The study controls for previous engagement in volunteering activities and, as expected, they find a positive effect on future volunteering, but as in Li (2007), the authors do not distinguish the effect for those who become widowed and those who remained married.

Other studies, not focused on widowhood, find nonsignificant effects of changes in partnership status on volunteering, but they are not able to distinguish between a partner's death and other reasons for changes in partnership status (Hank and Erlinghagen 2009; Broese van Groenou and van Tilburg 2010).

Isherwood, King, and Luszcz (2012) is one of the few studies that examines changes in volunteering around the transition to widowhood over a long period of time. Similarly to Utz et al. (2002), however, they do not focus specifically on volunteering but rather on what they refer to as a social activities score. The score, ranging from 0 to 24, refers to the frequency of participation in a variety of activities, such as volunteering, paid employment, telephone calls to friends or family, recreational or sporting activities, or going for a drive or outing. Using data from the Australian Longitudinal Study of Ageing, the authors identify 344 individuals who experienced widowhood during the observation period and find that widowed participants scored higher on the social activities scale compared to married participants. They also find that before widowhood, social activities were decreasing until about five years before partner's death, and then the participation in social activities increased until about six years after widowhood when participation began to decrease again.

Our contribution to the scarce literature on widowhood and volunteering is manifold. None of the studies that are focused on the partner's death and volunteering have considered longitudinal data covering a long period of time. Drawing on longitudinal data from HRS (1996–2014), the current study contributes to this literature

by examining the trajectories of volunteering activities potentially over almost 20 years on a much larger sample of individuals aged 50 and over who lost their spouse ($n = 1,982$) as compared to previous studies.

Thanks to the long period of observation and the analytic approach employed, we are able to identify processes of adaptation and recovery after widowhood, as well as anticipation effects prior to the partner's loss. Widowhood is a process that may have started well before the event. In particular, a partner's health may have deteriorated well before the event, and this may have produced a negative effect several years before the partner's death. Using a longer period of observation than previous studies is then important to avoid underestimating the negative effects due to processes that preceded widowhood. Additionally, we are also able to control for unobserved time-invariant potential confounders.

Furthermore, none of the abovementioned studies have considered the gendered nature of the transition to widowhood. Therefore, one of the most important contributions of our study is to examine whether the trajectories of volunteering before and after the transition to widowhood are different for women and men. We also examine gender differences associated with the role of death expectedness and of the partner's volunteering before death.

3. Data

This paper draws on longitudinal data from HRS, which is a panel study conducted every two years on a representative sample of adults aged 50 and older living in the United States.

The advantages of using HRS for this study are threefold. First, HRS collects information on the respondent and his/her spouse, so we have detailed information on both partners. Second, in case of the death of the partner, HRS collected a specific question around the circumstances of the death. Therefore, we have information both on the exact time when the event happened but also if the death was expected or not as reported by a proxy of the deceased, usually the partner. Finally, being a panel data with a long follow-up period, HRS allows us to follow individuals potentially over almost 20 years.

Pooling together data from 1996 to 2014, we ended up with 34,506 individuals. The present study focused on the trajectories of volunteering activities before and after spousal loss; therefore, we selected only respondents who experienced widowhood after the age of 50 and during the follow-up period (4,507 individuals). We excluded then those already widowed at the first observation and those who remained married or single during the entire observation period (29,999 respondents). We further excluded

those with missing information either on volunteering activities (52 individuals) or on the date of death of the spouse (478 individuals). To analyze the patterns of volunteering, the present study used a logit fixed effects model (see Section 5: Empirical Strategy for further details). The logit fixed effects model can be estimated only if at least one change in the outcome variable is observed (Allison 2009). Then, we cannot consider those who were either always active or not active in volunteering over the observational period. Our final sample consisted of 1,982 individuals (74.27% women) aged 50 and over who experienced widowhood during the observational period and with valid information on the timing of the transition to widowhood. On average, our sample was followed over more than 13 years (on average 158 months from first to last interview) for a total sample size of 16,183 observations. Note that, as in any unbalanced panel data analysis, we did not have to restrict the analyses to individuals observed for the entire period. In other words, each individual contributed to the estimation for the time points they have been observed for.

4. Measures

4.1 Outcome

Volunteering. Volunteering has been considered a dummy variable equal to 1 if the participant had spent any time in the 12 months prior to the interview doing volunteering for religious, educational, health-related, or other charity organizations, 0 otherwise.

HRS also reports a measure of engagement in volunteering activities in four levels (0 hours, 1–100h, 100–200h, 200h+). However, the choice of thresholds seems arbitrary, and only few cases (10.64% of cases) reported more than 100h of engagement. We have estimated our main model using three different specifications: (i) with a dummy variable equal to 1 if the person was engaged in volunteering, (ii) with a dummy variable equal to 1 if the person was highly engaged in volunteering (more than 100h), and (iii) using the different levels of engagement. The overall trend identified is similar across the specifications (results available from the authors). These results seem then to suggest that there are no relevant differences in considering the levels of engagement, or in a more straightforward way the active engagement, or lack thereof, in volunteering in response to spousal loss. For simplicity then, and in order to have a larger sample size for more precise estimates, we report here that the results referred to the dummy variable indicating if the person was or was not engaged in volunteering activities.

4.2 Explanatory variables

The transition to widowhood: timing and type of death. Key information to reconstruct the pathways of volunteering is the exact timing of the transition to widowhood. Since the survey is conducted every two years, simply looking at the change in marital status between two consecutive waves was unsatisfactory to identify processes of adaptation and recovery.

In case of the death of a participant, HRS collects a set of information in their HRS Exit/Post-Exit Interview. This information – provided by a proxy of the deceased, usually the partner – includes the time of death (month and year). Since HRS interviews both couple members, we were able to match the time of death of the spouse with the time of the interviews of the survivor. Therefore, we constructed a variable representing the difference in months between the interview and the time of the transition to widowhood. We categorized this variable in seven levels if the interview happened: (i) 36 months or more before the death (reference category), (ii) 24 to 36 months before, (iii) 12 to 24 months before, (iv) 0 to 12 months before, (v) 0 to 12 months after the death of the spouse, (vi) 12 to 24 months after, and (vii) 24 months or more after.

Apart from gender, we consider two additional factors that may modify the volunteering trajectories before and after widowhood.

Death expectedness. In the HRS Exit/Post-Exit Interview, other information available is if the death was expected or not (dummy variable) at the time it occurred. As for the time of death, a proxy of the deceased reported this information.

Partner's volunteering. The propensity of being engaged into volunteering and the way the person responded to the loss might depend on whether the partner was involved or not in benevolent activities. We created a dummy variable indicating whether the partner volunteered in at least one of the three years prior to his/her death.

4.3 Controls

Health. Deterioration in health and onset of functional limitations might change traditional division of housework and caregiving and reduce the chance of being engaged in volunteering. We expected to find a negative effect of health condition on the propensity of doing volunteering for both men and women. The study considered two health measures: self-rated health (SRH) and functional limitations. SRH is a reliable indicator of general level of health (Lunderber and Maderbacka 1996) and a good predictor of older people's mortality (DeSalvo et al. 2006). We recoded the SRH in a dummy variable indicating if the respondent was in a 'poor' or 'fair' health condition. Information on functional limitations has been included as a dummy variable

indicating if the person had at least one activity of daily living (ADL) or instrumental activities of daily living (IADL) limitation. ADL and IADL represent the ability of an older adult to perform self-care daily activities (e.g., personal hygiene, dressing, eating) and/or live independently (e.g., clean house, prepare meals).

Labor force participation. People still active in the labor market later in life are more socially active and exposed to a larger support network. This might positively affect the adjustment during and after bereavement, reducing the sense of loneliness and loss, with gender-specific differences (e.g., Nieboer, Lindenberg, and Ormel 1998–1999), and increasing the chance of being engaged in volunteering activities. Nevertheless, being in a paid job reduces the time available to be engaged in social activities. We included a dummy variable indicating if the respondent was in a paid job at the time of interview.

Other sociodemographic characteristics. We considered in the analysis the following sociodemographic characteristics: age (linear and quadratic terms) and household income. We used the equalized household income square root scale to account for household size. The square root scale is commonly used in applied research and simply divides the household income by the square root of the number of household members. (See for instance Dudel, Garbuszus, and Schmied [2020] for a discussion on different types of income measures.) Additional characteristics such as the health condition of the partner prior to the death and change in mental health and educational level of the survivor have been included as well in a robustness check.

Table 1 reports information on the data structure and the sociodemographic characteristics of the respondents.

Table 1: Sample characteristics

	Female	Male	Total
Number of individuals	1,472	510	1,982
Death expectedness	55.96%	59.65%	56.90%
Partner active in volunteering*	45.24%	48.12%	46.00%
Age at widowhood	72.38 (9.07)	75.84 (9.39)	73.24 (9.27)
Being in poor or fair health	25.76%	30.29%	26.93%
At least one ADL or IADL difficulty	22.79%	32.04%	25.18%
Being in paid job	38.65%	47.06%	40.82%
Income	36,366.97 (49,487.95)	34,308.22 (38,867.51)	35,837.22 (46,984.01)
Months of follow up	162.15 (57.39)	148.2 (62.96)	158.1 (59.4)

Note: It refers to the condition at the time of widowhood. Standard deviations reported in parentheses.

* The percentage refers to nonmissing cases (1,335 among women and 480 among men).

5. Empirical strategy

We used longitudinal logit fixed effects (FE) models to analyze the trajectories of volunteering activities before and after transition to widowhood. FE models account for unobserved individual-specific characteristics that might influence the probability to volunteer (e.g., personality traits, values, religiosity) and eventually be related to the transition to widowhood. Accounting for unobservable confounders reduces the bias due to unobserved heterogeneity. The FE model also allowed us to control for the observed time-varying factors listed above (i.e., age, health condition, employment status). We did not use between-within models that would have allowed us to estimate differences between those who experience widowhood and those who remain married because our focus was on trajectories in volunteering before and after experiencing the partner's death.

We applied an analytic strategy similar to the approach used by Clark et al. (2008) and Myrskylä and Margolis (2014), among others, to examine changes in subjective well-being around the time of relevant life events. The approach consists of using lags and leads in the FE models to identify anticipation effects and short- and long-term changes in propensity of volunteering before and over the course of bereavement.

The model reads as follows:

$$V_{i,t} = \alpha_i + \beta_1 B_{i,t}^{36+} + \beta_2 B_{i,t}^{24-36} + \beta_3 B_{i,t}^{12-24} + \beta_4 B_{i,t}^{0-12} + \beta_5 A_{i,t}^{0-12} + \beta_6 A_{i,t}^{12-24} + \beta_7 A_{i,t}^{24+} + \gamma X_{i,t} + \varepsilon_{i,t},$$

where $V_{i,t}$ represents volunteering of individual i at time t ; α is the fixed effect, representing time-invariant unobserved individual characteristics; and B and A are a series of seven time-dummy indicators representing the time difference between the interview and the time of the transition to widowhood. Their coefficients (β) are then interpreted as the change in propensity of doing volunteer (log-odds) activities before and after spousal loss, respectively, and X is a vector of time-varying covariates listed above, namely age, income, labor force participation, self-rated health, and functional limitations.

We first ran the above model controlling for all time-varying characteristics on the whole working sample to have an average pattern of change in volunteering activities (Figure 1). We then stratified the analyses by gender (Figure 2) to identify gender-specific differences. Afterward, we estimated gender-specific pathways if the death was expected or not (Figure 3) and if the partner was volunteering or not in the years prior to his/her death (Figure 4) to see if widows and widowers differ in their reactions to spousal loss according to the type of death and involvement of the partner in

volunteering. Complete estimated regression coefficients for all models are reported in the Appendix.

The random effect (RE) model would have been a possible alternative model specification to estimate developmental trajectories. The logit RE model would have allowed considering the entire sample and not only those who had at least one change in their volunteering activities. However, the RE model does not allow accounting for unobserved characteristics that, as aforementioned, might affect the propensity of doing volunteering and using coping strategies after spousal loss. Moreover, we are more interested in looking at the effect of widowhood within individuals rather than between individual differences. For sensitivity analysis we ran both model specifications. The patterns observed are similar but the Hausman specification test clearly rejects the null hypothesis of consistency of RE estimates in favor of a fixed effects model (results available upon request). Our preferred empirical strategy then remains the logit fixed effects model.

6. Results

6.1 Volunteering trajectories before and after spousal death

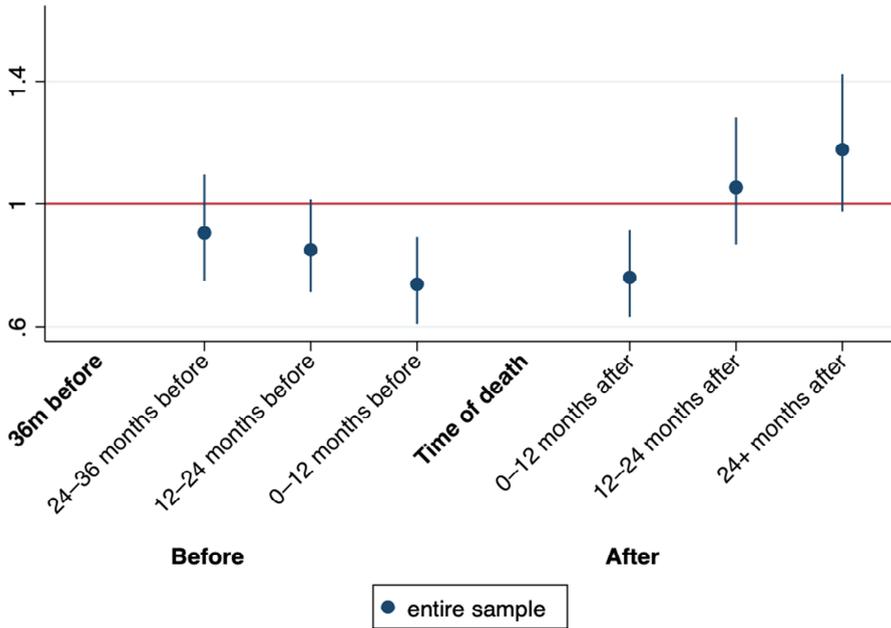
Figures 1–4 report the estimated odds of volunteering before and after spousal death at different times as compared to the same odds at three years before the partner's death (odds ratios, OR). In other words, the reported estimates can be interpreted in terms of change in the odds of volunteering with respect to the situation three years before the event. Therefore, they should not be interpreted in terms of absolute levels of probability of volunteering at each time point. Next to the odds ratios we report their 95% confidence intervals.

On the whole sample (Figure 1), the FE model shows a clear U-shaped pattern consistent with adaptation theory with decreased odds of engagement right before and right after the event (within one year before and after the event; both statistically significant) as compared to three years before transition to widowhood. This average pattern suggests a strong bereavement period that lasts around 12 months, in which individuals are less likely to be engaged in volunteering but also strong anticipation effects with behavioral changes that start one to two years before the event.

The propensity of being engaged in volunteering activities declines, almost linearly, before the death of the spouse (from OR = 0.904 24 to 36 months before the event to 0.737 12 months before spousal loss; Figure 1). Then it remains quite low until 12 months after the event (OR = 0.759). Finally, we observe a strong recovery with levels observed two years after death higher than those observed three years before

death, although confidence intervals tend to be rather wide due to the sample size (OR at two or more years = 1.178).

Figure 1: Odds of doing volunteering activities before and after spousal loss relative to 36 months before partner’s death (odds ratios) with 95% confidence intervals



Note: Reference category: interview happened 36+ months before spousal loss. Confidence intervals are not symmetrical because they refer to odds ratios estimated from logistic regressions. Time indicators are the differences in months between date of interview and date of spousal death. Model accounts for age, health, working condition, and income. Full estimates are available in Table A-1 in Appendix.

With regard to the sociodemographic characteristics considered in the model (Table A-1 in Appendix), we found that there is a nonlinear association between age of the respondent and likelihood of being engaged in volunteering activities (estimated OR of 1.542 for age and 0.997 for age squared). Having health difficulties, in terms of onset of at least one functional limitation or degradation in general health, reduces the probability of doing volunteering (OR respectively of 0.659 and 0.504). Finally, those who are still employed, probably due to time constraint, are less likely to be engaged in

volunteering activities as compared to those not employed (OR = 0.725). As expected, the respondent with higher economic resources are more likely to be engaged in volunteering (OR = 1.071).

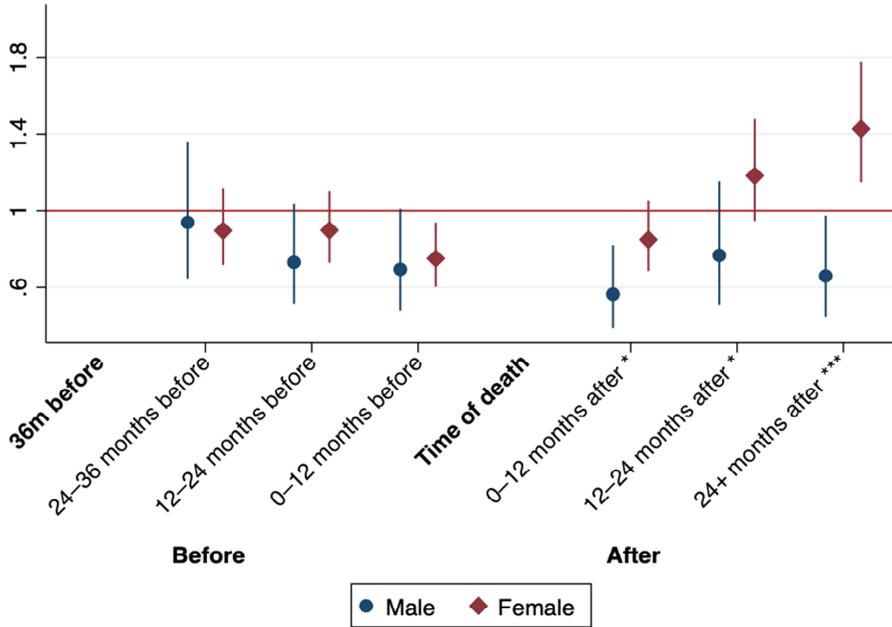
6.2 Gender differences in volunteering trajectories

Figure 2 illustrates gender differences in volunteering trajectories in response to spousal loss. As above, we report, now separately for each gender, the odds of volunteering at each time point as compared to the odds of volunteering three years before partner's death (odds ratios) and their confidence intervals. Additionally, below the x-axis and next to the time points' labels we report the significance levels of the test of differences by gender estimated by pooling both genders together and adding interactions with the time periods' dummy variables.

For both men and women, an anticipation effect is observed with the odds of volunteering declining before the event. Such reduction is stronger among men, in particular up to two years before the event. For instance, 12 to 24 months prior to spousal loss, the odds ratio estimated for men is of 0.732 and of 0.897 for women as compared to three years before death. Despite the difference in magnitude between ORs estimated for men and women, the differences in patterns prior to the event are not statistically significant.

Gender differences appear to be more evident when considering the three periods following transition to widowhood (see significance levels of the difference between men and women below the x-axis). Among women, after a bereavement period of 12 months characterized by reduced engagement, the odds of doing volunteering activities recovers, on average, to levels higher than the one observed three years prior to the event. As shown in Figure 2, the estimated ORs for women are consistently positive from 12 months after the event, in particular after two years. This means that two years after a partner's death, women's odds of volunteering are, on average, higher than their odds of volunteering three years before this event (OR = 1.427). Such recovery is not observed among men. On the contrary, men's odds of volunteering are always estimated to be lower than three years before they become a widower.

Figure 2: Odds of doing volunteering activities before and after spousal loss relative to 36 months before partner’s death (odds ratios) with 95% confidence intervals, by gender



Note: Reference category: interview happened 36+ months before spousal loss. Confidence intervals are not symmetrical because they refer to odds ratios estimated from logistic regressions. The significance levels reported below the x-axis refer to the fully interact model to test gender differences, *** $p < 0.01$ and * $p < 0.1$. Time indicators are the differences in months between date of interview and date of spousal death. Model accounts for age, health, working condition, and income. Full estimates are available in Table A-1 in Appendix.

6.3 Volunteering trajectories according to death expectedness

Figure 3 shows how odds of volunteering change at different time points compared to three years before a partner’s death, distinguishing by whether death was expected or not and separately by gender. Below the x-axis and next to the time points’ labels we report the significance levels of the test of differences by death expectedness estimated by pooling both groups together and adding interactions with time period’s dummy variables. Figure 3 indicates that the results shown before seem to be mostly driven by the cases in which death was expected, both in a positive (for women) and negative (for

men) sense. For both genders, if the death was expected, we observe a relevant decline in the odds of volunteering right before the event. This anticipation effect is in magnitude stronger among men and not statistically significant for both genders if death was not expected. After the transition to widowhood among women, the recovery seems faster and stronger if the loss was expected. In fact, after two years from the partner's death the OR of volunteering compared to three years before widowhood is 1.554 in case of expected death and 1.297 otherwise. As shown by the relatively large confidence intervals estimated for both genders, differences between the two groups are hard to depict, probably due to the reduced sample size given by the additional sample stratification.

For men, we observe similar patterns after transition to widowhood independently of death expectedness.

Figure 3: Odds of doing volunteering activities before and after spousal loss relative to 36 months before partner's death (odds ratios) with 95% confidence intervals, by whether partner's death was expected or not and gender (women in top panel and men in bottom panel)

Women

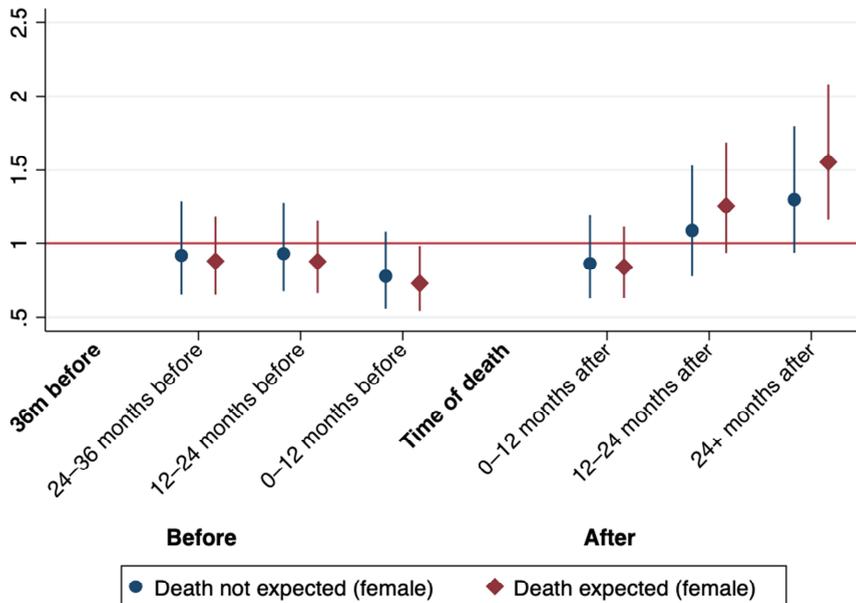
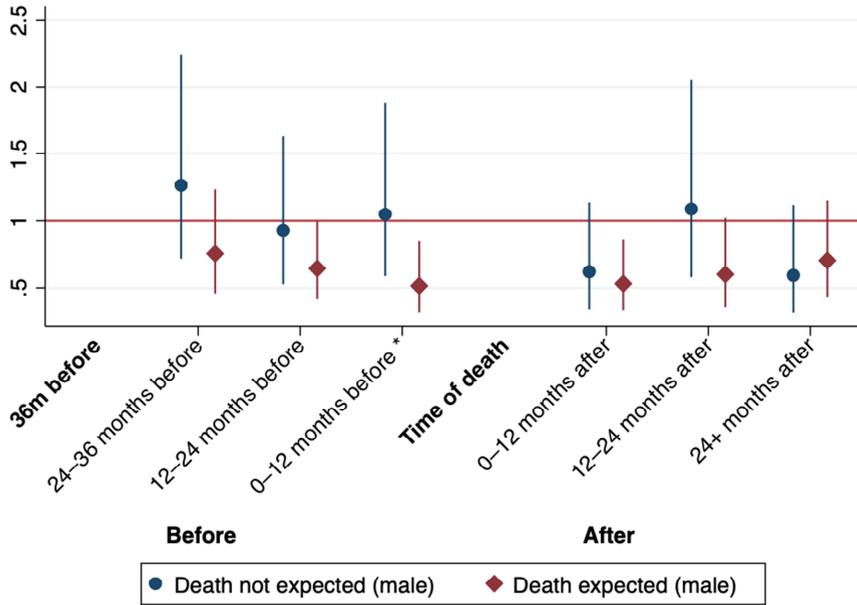


Figure 3: (Continued)

Men



Note: Reference category: interview happened 36+ months before spousal loss. Confidence intervals are not symmetrical because they refer to odds ratios estimated from logistic regressions. The significance levels reported below the x-axis refer to the fully interact model to test differences between those who had an expected or unexpected loss, * $p < 0.1$. Time indicators are the differences in months between date of interview and date of spousal death. Model accounts for age, health, working condition, and income. Full estimates are available in Table A-2 in Appendix.

6.4 Volunteering trajectories according to partner’s pre-death volunteering

Figure 4 illustrates how the odds of volunteering vary compared to three years before the partner’s death, distinguishing by whether the partner was involved in volunteering or not pre-death and separately by gender.

Before the transition to widowhood we do not observe substantial changes in the odds of volunteering for women. The only exception is for the period two to three years before a partner’s death where the complementarity among partners’ volunteering seems to become slightly stronger: odds of volunteering slightly increase (decrease) compared to the previous period if the partner was (was not) volunteering. After the partner’s death, and consistent with the implications of the complementarity hypothesis,

we observe for both genders increased odds of volunteering as compared to three years before the partner’s death if the partner was not volunteering. This pattern is particularly strong and evident for women. On the contrary, if the partner was volunteering pre-death, men’s odds of volunteering stably decrease in all periods after transition to widowhood. For women, the odds of volunteering decrease right after partner’s death. Notice that for both genders the differences in the ORs for the groups of survivors whose partners were and were not engaged in volunteering before death are statistically significant at each time period after widowhood (see significance levels reported below the x-axis).

Figure 4: Odds of doing volunteering activities before and after spousal loss relative to 36 months before partner’s death (odds ratios), with 95% confidence intervals, by whether pre-death the partner was active in volunteering for women (top panel) and men (bottom panel)

Women

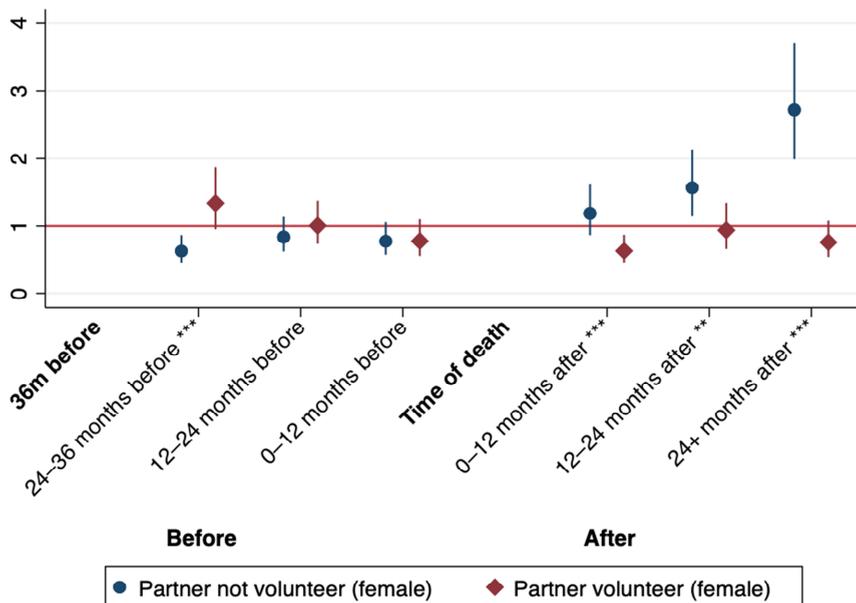
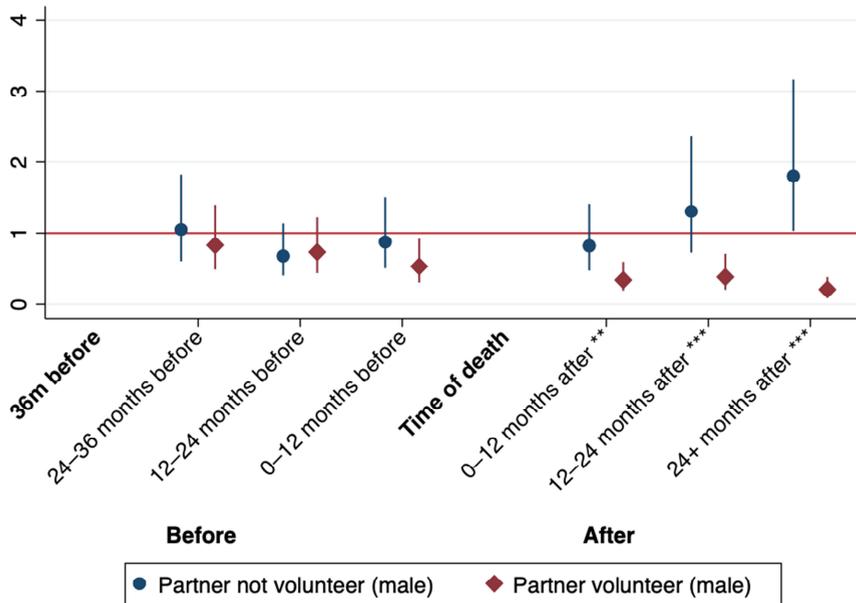


Figure 4: (Continued)**Men**

Note: Reference category: interview happened 36+ months before spousal loss.

Confidence intervals are not symmetrical because they refer to odds ratios estimated from logistic regressions.

The significance levels reported below the x-axis refer to the fully interact model to test differences according to volunteering activity of the partner, *** $p < 0.01$ and ** $p < 0.05$.

Time indicators are the differences in months between date of interview and date of spousal death.

Model accounts for age, health, working condition, and income. Full estimates are available in Table A-3 in Appendix.

6.5 Robustness checks and additional analyses

We conducted several robustness checks (results available upon request). This study considers volunteering as a dummy variable. As mentioned before, we tested different alternatives also using a measure of engagement in volunteering activities (0 hours, 1 to 100h, 100 to 200h, 200h or more). The overall trend identified is consistent with the one reported in the main text with a decline before death of the spouse and positive recovery trend afterward.

The FE model strategy has been applied in this study to reduce bias due to unobservable confounders. We compared our results with those obtained using RE models. The estimated patterns are similar to those reported in the text, and the

Hausman specification test clearly rejected the RE specification. We then retain the fixed effects as our preferred modeling strategy. We report in the text the results from a logit fixed effects model. The logit fixed effects model to be identified cannot include respondents for whom the dependent variable is either always 0 (i.e., those always inactive in our case) or always 1 (i.e., those always active) during the observational period (Allison 2009). This might have affected the estimated patterns. To test this limitation, we reran the analysis using a linear fixed effects model. In this case, we also included in the analytical sample those who were always active or inactive during the observational period (the model is identified even if there are no changes of the outcome variable within an individual). As further robustness check, we ran a hybrid RE-FE model that allows estimating both within and between effects over the entire sample. The results for both sets of models were very similar, leading to a validation of our analytic approach.

We studied the change in propensity in doing volunteering, including seven dummy variables representing different times before and after the death of the spouse. We tested other model specifications, reducing the number of dummies. The patterns remained similar over the different specifications.

Education is one of the main determinants of social participation (Putnam 2000; Wilson 2012). Highly educated individuals (Campbell 2006) and those with higher income (Kim and Hong 1998) are more likely to be engaged in civically oriented activities. Furthermore, highly educated individuals have access to larger financial resources and a stronger and wider social support network (Campbell, Marsden, and Hurlbert 1986; Lin 1999), receiving emotional, psychological, and instrumental support to effectively cope with stressful events (House, Umberson, and Landis 1988; Smith and Christakis 2008). We performed the analysis stratified by level of education and found no relevant differences between low and highly educated individuals. For ease of simplicity, we decided to not include and comment in detail on these results in the paper.

The family structure might play a role in mediating the effect of widowhood on volunteering. We compared our baseline model with and without information on number of people living in the household. Creating a new union can influence the attitude toward being engaged in volunteering activities and could be seen as a sign of recovering from the shock of the partner's loss. As a robustness check, we ran the analysis, stopping the observation at the wave of repartnering (110 cases). Results remained rather similar.

We looked at income and mental health (depressive symptoms) as potential mediator factors as well. The results in all three cases did not change substantially.

Religiosity and volunteering are strongly interconnected (Son and Wilson 2011), and religious and not-religious individuals might react differently to spousal loss

(Walsh et al. 2002). As a robustness check, we tested to see if considering the importance of religion affects the link between widowhood and being socially active. The volunteering trajectory remained very similar.

Our measure of whether the death of a spouse was expected or not is also an indicator of the health condition of the deceased and potentially the caregiving activities of the spouse. Information on actual caregiving activities was not available in all waves. As a robustness check, we used the self-rated health condition from the wave prior to death (i.e., the health condition of the partner up to two years prior to his/her death). The trajectories show very similar pathways. If the spouse was in a bad health condition, the propensity of doing volunteering activities of his/her partner declined prior to the event, and the adaptation process after losing the spouse took longer. We preferred to retain the information on the death since a proxy of the deceased, usually the spouse itself, reported it. Then, such reported information on the type of death might also represent how the respondent perceived the event of losing his or her long-lasting partner rather than a simple measure of the health condition prior to the death. The psychological consequences of experiencing a loss that has been perceived as sudden rather than anticipated might vary and influence differently the propensity of being engaged in social activities afterward.

7. Discussion

This study examined engagement in volunteering before and after spousal death. The study of reactions to spousal loss is particularly relevant in societies where individuals have relatively few economic, emotional, and social supports outside the family. Then, the loss of a long-standing companion becomes particularly difficult to cope with and brings relevant consequences. In particular, among older adults, being engaged in volunteering is at the same time a potential coping strategy, a way to keep good levels of physical and mental health, and a way to contribute in society, maintaining or reconstructing one's social and active roles. Generativity theory points to the positive effect of the act of giving as a way of leaving something to the next generations. Within this framework, helping others is seen as a way to increase a sense of purpose and fulfill the desire to leave a legacy beyond one's life.

This work improves the knowledge on the reactions to spousal death, one of the most traumatic events a person can experience during the life course. The majority of the literature on the topic focused on the psychological effects of spousal loss or looked at changes in behavior over a narrow time window. In this work, using data from HRS and applying a fixed effects model with lags and leads, we were able to identify processes of adaptation and recovery after the event and at the same time anticipation

effects prior to the loss. Thanks to the richness of the data, we were able to look over a long time span (potentially up to 20 years) and have information on whether death was or was not expected.

We found that volunteering trajectories before and after the partner's death are strongly gendered. Among women, after a bereavement period of 12 months characterized by reduced engagement, the probability of doing volunteer activities recovered to levels higher than the one observed three years prior to the event. Such recovery was instead not observed among men, for whom the probability of volunteering after the partner's death never returned to pre-death levels. These results are consistent with the hypothesis that men are also more dependent on their spouses than women in terms of engagement and social support (Antonucci and Akiyama 1978) and are therefore more affected by spousal loss.

The fact that both men and women reduced volunteering activities several months before a partner's death is likely due to the partner's health conditions and the likelihood of an increase in caregiving. Also, men were found to reduce volunteering before the partner's death more than women and even more than one year before spousal death. This seems to support past evidence on the positive effect of being married on volunteering, which was found to be particularly strong for men (Einolf and Philbrick 2014).

For both genders, we found that if the partner's death was expected, the probability of volunteering declines faster prior to the event (anticipation effects). This effect was stronger among men. Although we can only speculate on this, these anticipation effects are likely due to the burden of taking care of a sick partner. Deterioration in health of the spouse might result in caregiving activities to be carried out by the other partner, and this may reduce the likelihood of being engaged in volunteering activities. The strongest effect found for men may be related to the traditional gender roles in the division of household chores. Men, who are traditionally less engaged in housework and caregiving, might need to massively reduce their engagement in social activities if they have to start taking care of the house and/or a sick partner. After the loss, among women the probability of being engaged in volunteering activities is larger than if the loss was unexpected. Considering this again as a proxy of need to care for a partner who is 'expected to die soon,' the death might even be considered as a relief from the burden of caregiving, and the need to establish through the participation in benevolent activities to a new role in the society may arise.

Finally, we considered the role of the partner's volunteering pre-death and we found original new evidence in support of the complementarity hypothesis. More specifically, our analyses demonstrated for both genders, but especially for women, an increased likelihood of volunteering as compared to before the partner's death if the partner was not involved in volunteering. On the contrary, if the wife was volunteering

before death, men's odds of volunteering stably and significantly decrease in all periods after transition to widowhood. For women, the odds of volunteering decreased significantly, although slightly, only right after the partner's death.

The study has some limitations in terms of the sample considered. First of all, we considered only married couples for the sampling strategy of the HRS study. In order to have exact information on spousal death (date and reason why) we had to select only cohabitant couples with both partners included in the HRS study in at least one wave. In other words, if the partner was not interviewed since they were hosted in a residential care facility or due to severe health conditions, they were not part of our sample. An aspect to investigate in further research concerns the role of being a caregiver. Due to the data available, it was not possible to quantify informal caregiving activities done by the survivor at each wave. Based on previous studies, we considered women as those more likely to be the caregiver. Similarly, death expectedness was a proxy of caregiving (e.g., if the death was expected it was more likely that the survivor had to provide some form of caregiving). Future research should try to quantify, using additional data sources, the direct effect of the burden of caregiving activities on volunteering. Finally, information on when exactly in the 12 months prior to the interview the respondents volunteered was not asked. So, we cannot be more precise in defining the time difference between the moment of volunteering and the death of the spouse. This will not affect the main results of this work, but the estimates around the event may have to be interpreted with caution.

Our findings provide evidence that the loss of a partner has relevant effects on the engagement in volunteering in particular among men. Given the positive effects of volunteering both for the volunteer and the society as a whole, policy makers and family counselors need to take into account that a stressful event, such as a partner's death, may not only have substantial negative psychological effects on the survivor but it may also produce behavioral consequences, such as reduced engagement in volunteering, which may exacerbate the negative effects of widowhood in terms of reduced support and worse health conditions. Our results contribute to the literature on models of ageing, showing that family events may impact participation in society for older people. They also contribute to the widowhood literature by demonstrating heterogeneous effects, especially in terms of gender differences.

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References

- Allison, P.D. (2009). *Fixed effects regression models* (Vol. 160). New York: Sage. doi:[10.4135/9781412993869](https://doi.org/10.4135/9781412993869).
- Amster, L.E. and Krauss, H.H. (1974). The relationship between life crises and mental deterioration in old age. *International Journal of Aging and Human Development* 5(1): 51–55. doi:[10.2190/JA32-3VFR-29X4-D3Q7](https://doi.org/10.2190/JA32-3VFR-29X4-D3Q7).
- Anderson, T.B. (1983). Widowhood as a life transition: Its impact on kinship ties. *Journal of Marriage and the Family* 46(1): 105–114. doi:[10.2307/351869](https://doi.org/10.2307/351869).
- Antonucci, T.C. and Akiyama, H. (1987). An examination of sex differences in social support among older men and women. *Sex Roles* 17: 737–749. doi:[10.1007/BF00287685](https://doi.org/10.1007/BF00287685).
- Atchley, R.C. (1975). Dimensions of widowhood in later life. *The Gerontologist* 15(2): 176–178. doi:[10.1093/geront/15.2.176](https://doi.org/10.1093/geront/15.2.176).
- Baker, M.J. and Jacobsen, J.P. (2007). Marriage, specialization, and the gender division of labor. *Journal of Labor Economics* 25(4): 763–793. doi:[10.1086/522907](https://doi.org/10.1086/522907).
- Bankoff, E.A. (1983). Social support and adaptation to widowhood. *Journal of Marriage and the Family* 45(4): 827–839. doi:[10.2307/351795](https://doi.org/10.2307/351795).
- Becker, G.S. (1991). *A treatise on the family*. Enlarged ed. Cambridge, MA: Harvard University Press.
- Bennett, K.M. (2007). ‘No Sissy Stuff’: Towards a theory of masculinity and emotional expression in older widowed men. *Journal of Aging Studies* 21(4): 347–356. doi:[10.1016/j.jaging.2007.05.002](https://doi.org/10.1016/j.jaging.2007.05.002).
- Bennett, K.M. (2010a). How to achieve resilience as an older widower: Turning points or gradual change? *Ageing and Society* 30(3): 369–382. doi:[10.1017/S0144686X09990572](https://doi.org/10.1017/S0144686X09990572).
- Bennett, K.M. (2010b). You can’t spend years with someone and just cast them aside: Augmented identity in older British widows. *Journal of Women and Aging* 22(3): 204–217 doi:[10.1080/08952841.2010.495571](https://doi.org/10.1080/08952841.2010.495571).
- Bonanno, G.A., Westphal, M., and Mancini, A.D. (2011). Resilience to loss and potential trauma. *Annual Review of Clinical Psychology* 7: 511–535. doi:[10.1146/annurev-clinpsy-032210-104526](https://doi.org/10.1146/annurev-clinpsy-032210-104526).

- Broese van Groenou, M. and van Tilburg, T. (2010). Six-year follow-up on volunteering in later life: A cohort comparison in the Netherlands. *European Sociological Review* 28(1): 1–11. doi:10.1093/esr/jcq043.
- Brickman, P. and Campbell, D.T. (1971). Hedonic relativism and planning the good society. In Appley, M.H. (ed.) *Adaptation-level theory: A symposium*. New York: Academic Press: 287–305.
- Campbell, D. (2006). What is education's impact on civic and social engagement? In: Desjardins, R. and Schuller, T. (eds.). *Measuring the effects of education on health and civic engagement: Proceedings of the Copenhagen Symposium*. Paris: OECD: 25–126.
- Campbell, K.E., Marsden, P.V., and Hurlbert, J.S. (1986). Social resources and socioeconomic status. *Social Networks* 8(1): 97–117. doi:10.1016/S0378-8733(86)80017-X.
- Carr, D., House, J.S., Wortman, C., Nesse, R., and Kessler, R.C. (2001). Psychological adjustment to sudden and anticipated spousal loss among older widowed persons. *The Journals of Gerontology Series B: Psychological Sciences and Social Sciences* 56(4): S237–S248. doi:10.1093/geronb/56.4.S237.
- Carr, D. and Utz, R. (2002). Late-life widowhood in the United States: New directions in research and theory. *Ageing International* 27: 65–88. doi:10.1007/s12126-001-1016-3.
- Carr, D.C., Fried, L.P., and Rowe, J.W. (2015). Productivity and engagement in an aging America: The role of volunteerism. *Daedalus* 144(2): 55–67 doi:10.1162/DAED_a_00330.
- Carr, D.C., Kail, B.L., Matz-Costa, C., and Shavit, Y.Z. (2018). Does becoming a volunteer attenuate loneliness among recently widowed older adults? *The Journals of Gerontology: Series B* 73(3): 501–510. doi:10.1093/geronb/gbx092.
- Clark, A.E., Diener, E., Georgellis, Y., and Lucas, R.E. (2008). Lags and leads in life satisfaction: A test of the baseline hypothesis. *The Economic Journal* 118(529): F222–F243. doi:10.1111/j.1468-0297.2008.02150.x.
- DeSalvo, K.B., Blosner, N., Reynolds, K., He, J., and Muntner P. (2006). Mortality prediction with a single general self-rated health question. *Journal of General Internal Medicine* 21(267): 267–275. doi:10.1111/j.1525-1497.2005.00291.x.

- Donnelly, E.A. and Hinterlong, J.E. (2009). Changes in social participation and volunteer activity among recently widowed older adults. *The Gerontologist* 50(2): 158–169. doi:10.1093/geront/gnp103.
- Dudel, C., Garbuszus, J.M., and Schmied, J. (2020). Assessing differences in household needs: A comparison of approaches for the estimation of equivalence scales using German expenditure data. *Empirical Economics*. doi:10.1007/s00181-020-01822-6.
- Einolf, C.J. and Philbrick, D. (2014). Generous or greedy marriage? A longitudinal study of volunteering and charitable giving. *Journal of Marriage and Family* 76(3): 573–586. doi:10.1111/jomf.12115.
- Engelhardt, H., Buber, I., Skirbekk, V., and Prskawetz, A. (2010). Social involvement, behavioural risks and cognitive functioning among older people. *Ageing and Society* 30(5): 779–809. doi:10.1017/S0144686X09990626.
- Frederick, S. and Loewenstein, G. (1999). Hedonic adaptation. In Kahneman, D., Dienerand, E., and Schwarz, N. (eds.). *Well-being: The foundations of hedonic psychology*. New York: Sage: 302–329.
- George, L.K. (1993). Sociological perspectives on life transitions. *Annual Review of Sociology* 19: 353–373. doi:10.1146/annurev.so.19.080193.002033.
- Gottlieb, B. and Gillespie, A. (2008). Volunteerism, health, and civic engagement among older adults. *Canadian Journal on Aging* 27(4): 399–406. doi:10.3138/cj.a.27.4.399.
- Gumà, J. and Fernández-Carro, C. (2019). Life goes on: The influence of the perceived quality of social relations on older women’s mental health after the loss of a partner in Europe. *Ageing and Mental Health*. doi:10.1080/13607863.2019.1675141.
- Hallberg, D. (2003). Synchronous leisure, jointness and household labor supply. *Labour Economics* 10(2): 185–203. doi:10.1016/S0927-5371(03)00006-X.
- Hank, K. and Erlinghagen, M. (2009). Dynamics of volunteering in older Europeans. *The Gerontologist* 50(2): 170–178. doi:10.1093/geront/gnp122.
- Hatch, L.R. and Bulcroft, K. (1992). Contact with friends in later life: Disentangling the effect of gender and marital status. *Journal of Marriage and the Family* 54(1): 222–232. doi:10.2307/353289.

- Heinemann, G.D. and Evans, P.L. (1990). Widowhood: Loss, change, and adaptation. In: Brubaker, T.H. (ed.). *Family relationships in later life*. Newbury Park, CA: Sage: 142–168.
- Holland, J.M., Thompson, K.L., Rozalski, V., and Lichtenthal, W.G. (2014). Bereavement-related regret trajectories among widowed older adults. *Journals of Gerontology, Series B: Psychological Sciences and Social Sciences* 69(1): 40–47. doi:10.1093/geronb/gbt050.
- House, J.S., Umberson, D., and Landis, K.R. (1988). Structures and processes of social support. *Annual Review of Sociology* 14(1): 293–318. doi:10.1146/annurev.so.14.080188.001453.
- Hultsch, D.F., Hertzog, C., Small, B.J., and Dixon, R.A. (1999). Use it or lose it: Engaged lifestyle as a buffer of cognitive decline in aging? *Psychology and Aging* 14(2): 243–263. doi:10.1037/0882-7974.14.2.245.
- Hungerford, T.L. (2001). The economic consequences of widowhood on elderly women in the United States and Germany. *The Gerontologist* 41(1): 103–110. doi:10.1093/geront/41.1.103.
- Isherwood, L.M., King, D.S., and Luszcz, M.A. (2012). A longitudinal analysis of social engagement in late-life widowhood. *The International Journal of Aging and Human Development* 74(3): 211–229. doi:10.2190/AG.74.3.c.
- Kim, D.Y. and Hong, G.S. (1998). Volunteer participation and time commitment by older Americans. *Family and Consumer Sciences Research Journal* 27(2): 146–166. doi:10.1177/1077727X980272003.
- Kowalski, S.D. and Bondmass, M.D. (2008). Physiological and psychological symptoms of grief in widows. *Research in Nursing and Health* 31(1): 23–30. doi:10.1002/nur.20228.
- Lancee, B. and Radl, J. (2014). Volunteering over the life course. *Social Forces* 93(2): 833–862. doi:10.1093/sf/sou090.
- Li, Y. (2007). Recovering from spousal bereavement in later life: Does volunteer participation play a role? *Journal of Gerontology: Social Sciences* 62(4): 257–266. doi:10.1093/geronb/62.4.S257.
- Lin, N. (1999). Social networks and status attainment. *Annual Review of Sociology* 25: 467–498. doi:10.1146/annurev.soc.25.1.467.

- Lunderber, O. and Manderbacka, K. (1996). Assessing reliability of a measure of self-rated health. *Scandinavian Journal of Public Health* 24(3): 218–224. doi:10.1177/140349489602400314.
- Luhmann, M., Hofmann, W., Eid, M., and Lucas, R.E. (2012). Subjective well-being and adaptation to life events: A meta-analysis on differences between cognitive and affective well-being. *Journal of Personality and Social Psychology* 102(3): 592–615. doi:10.1037/a0025948.
- Luo, S. (2017). Assortative mating and couple similarity: Patterns, mechanisms, and consequences. *Social and Personality Psychology Compass* 11(8): e12337. doi:10.1111/spc3.12337.
- Musick, M. and Wilson, J. (2007). *Volunteers: A social profile*. Indianapolis: Indiana University Press.
- Myrskylä, M. and Margolis, R. (2014). Happiness: Before and after the kids. *Demography* 51(5): 1843–1866. doi:10.1007/s13524-014-0321-x.
- Nieboer, A.P., Lindenberg, S.M., and Ormel, J. (1998–1999). Conjugal bereavement and well-being of elderly men and women: A preliminary study. *OMEGA: Journal of Death and Dying* 38(2): 119–141. doi:10.2190/B89H-KGFC-WP0T-T7K1.
- O’Bryant, S.L. (1990–1991). Forewarning of a husband’s death: Does it make a difference for older widows? *OMEGA: Journal of Death and Dying* 22(3): 227–239. doi:10.2190/08LH-LVR3-6TFJ-GD3N.
- Pearlin, L.I. (1982). The social contexts of stress. In: Goldberger, L. and Breznitz, S. (eds.). *Handbook of stress*. New York: Free Press: 367–379.
- Pearlin, L.I., Lieberman, M.A., Menaghan, E.G., and Mullan, J.T. (1981). The stress process. *Journal of Health and Social Behavior* 22(4): 337–356. doi:10.2307/2136676.
- Pearlin, L.I. and Schooler, C. (1978). The structure of coping. *Journal of Health and Social Behavior* 19(1): 2–21. doi:10.2307/2136319.
- Peters, A. and Liefbroer, A.C. (1997). Beyond marital status: Partner history and well-being in old age. *Journal of Marriage and the Family* 59(3): 687–699. doi:10.2307/353954.
- Pinquart, M. and Sorensen, S. (2003). Differences between caregivers and noncaregivers in psychological health and physical health: A meta-analysis. *Psychology and Aging* 18(2): 250–267. doi:10.1037/0882-7974.18.2.250.

- Pillemer, K. and Glasgow, N. (2000). Social integration and aging. In: Pillimer, K., Moen, P., Wethington, E., and Glasgow, N. (eds.). *Social integration in the second half of life*. Baltimore: Johns Hopkins University Press.
- Putnam, R.D. (2000). *Bowling alone: The collapse and revival of American community*. New York: Simon and Schuster. doi:10.1145/358916.361990.
- Rotolo, T. and Wilson, J. (2006). Substitute or complement? Spousal influence on volunteering. *Journal of Marriage and Family* 68(2): 305–319. doi:10.1111/j.1741-3737.2006.00254.x.
- Son, J. and Wilson, J. (2011). Generativity and volunteering. *Sociological Forum* 26(3): 644–667. doi:10.1111/j.1573-7861.2011.01266.x.
- Schaan, B. (2013). Widowhood and depression among older Europeans: The role of gender, caregiving, marital quality, and regional context. *Journals of Gerontology Series B: Psychological Sciences and Social Sciences* 68(3): 431–442. doi:10.1093/geronb/gbt015.
- Smith, K.P. and Christakis, N.A. (2008). Social networks and health. *Annual Review of Sociology* 34: 405–429. doi:10.1146/annurev.soc.34.040507.134601.
- Steinhauser, K.E., Christakis, N.A., Clipp, E.C., McNeilly, M., McIntyre, L., and Tulsky, J.A. (2000). Factors considered important at the end of life by patients, family, physicians, and other care providers. *JAMA: The Journal of the American Medical Association* 284(19): 2476–2482. doi:10.1001/jama.284.19.2476.
- Stroebe, W. and Stroebe, M.S. (1995). Stress and health. In: Stroebe, W. and Stroebe, M.S. (eds.) *Social psychology and health*. Buckingham: Open University Press: 171–200.
- Stroebe, M., Stroebe, W., and Schut, H. (2001). Gender differences in adjustment to bereavement: An empirical and theoretical review. *Review of General Psychology* 5(1): 62–68. doi:10.1037/1089-2680.5.1.62.
- Sullivan, O. (1996). Time co-ordination, the domestic division of labour and affective relations: Time use and the enjoyment of activities within couples. *Sociology* 30(1): 79–100. doi:10.1177/0038038596030001006.
- Thoits, P.A. (2012). Role-identity salience, purpose and meaning in life, and well-being among volunteers. *Social Psychology Quarterly* 75(4): 360–384. doi:10.1177/0190272512459662.

- US Census Bureau (2017a). Marital status – 2017. https://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ACS_17_1YR_S1201andprodType=table.
- US Census Bureau (2017b). Marriages ending in widowhood in the last year by sex by marital status for the population 15 years and over – 2017. https://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ACS_17_1YR_B12502andprodType=table.
- Utz, R.L., Carr, D., Nesse, R., and Wortman, C.B. (2002). The effect of widowhood on older adults' social participation: An evaluation of activity, disengagement, and continuity theories. *The Gerontologist* 42(4): 522–533. doi:10.1093/geront/42.4.522.
- Vitaliano, P.P., Scanlon, Z., and Zhang, H.M. (2003). Is caregiving hazardous to one's physical health? A meta-analysis. *Psychological Bulletin* 129(6): 946–997. doi:10.1037/0033-2909.129.6.946.
- Walsh, K., King, M., Jones, L., Tookman, A., and Blizard, R. (2002). Spiritual beliefs may affect outcome of bereavement: Prospective study. *British Medical Journal* 324: 1–5. doi:10.1136/bmj.324.7353.1551.
- Wheaton, B. (1985). Models for the stress-buffering functions of coping resources. *Journal of Health and Social Behavior* 26(4): 352–364. doi:10.2307/2136658.
- Wilcox, S., Everson, K.R., Aragaki, A., Wasserthil-Smooller, S., Mouton, C.P., and Loevinger, B.L. (2003). The effects of widowhood on physical and mental health, health behavior, and health outcomes: The Women's Health Initiative. *Health Psychology* 22(5): 513–522. doi:10.1037/0278-6133.22.5.513.
- Wilson, J. (2012). Volunteerism research: A review essay. *Nonprofit and Voluntary Sector Quarterly* 41(2): 176–212. doi:10.1177/0899764011434558.
- Wolff, J.L. and Kasper, J.D. (2006). Caregivers of frail elders: Updating a national profile. *The Gerontologist* 46(3): 344–356. doi:10.1093/geront/46.3.344.
- Yee, J.L. and Schulz, R. (2000). Gender differences in psychiatric morbidity among family caregivers: a review and analysis. *The Gerontologist* 40(2): 147–164. doi:10.1093/geront/40.2.147.

Appendix

Regression tables

Table A-1: Probability of doing volunteering last 12 months. Fixed effect logit models. Odds ratio

Variables	Entire sample		
	Male	Female	
Time before/after death of the spouse			
<i>(Ref interview 36+ months before spouse's death)</i>			
24–36 months before	0.904 (0.088)	0.938 (0.178)	0.895 (0.101)
12–24 months before	0.850* (0.077)	0.732* (0.130)	0.897 (0.095)
0–12 months before	0.737*** (0.072)	0.695* (0.133)	0.752** (0.085)
0–12 months after	0.759*** (0.072)	0.565*** (0.108)	0.849 (0.093)
12–24 months after	1.054 (0.105)	0.768 (0.159)	1.182 (0.134)
24+ months after	1.178* (0.114)	0.659** (0.131)	1.427*** (0.158)
Age of respondent			
Age	1.542*** (0.053)	1.730*** (0.128)	1.482*** (0.058)
Age squared	0.997*** (0.000)	0.996*** (0.001)	0.997*** (0.000)
Health condition			
Being in poor or fair health	0.659*** (0.041)	0.730** (0.090)	0.634*** (0.046)
At least one ADL or IADL difficulty	0.504*** (0.033)	0.505*** (0.064)	0.507*** (0.039)
Labor force status			
<i>(Ref not in a paid job)</i>			
In paid job	0.725*** (0.049)	0.715** (0.094)	0.728*** (0.057)
Equivalentised household income (logged)	1.071*** (0.027)	1.010 (0.055)	1.092*** (0.032)
Observations	16,183	4,029	12,154
Number of respondents	1,982	510	1,472

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Respondent aged 50+. Only those who become widow

Table A-2: Probability of doing volunteering last 12 month whatever the death was expected or not. Stratified by gender. Fixed effect logit models. Odds ratios

Variables	Female		Male	
	Death no expected	Death expected	Death no expected	Death expected
Time before/after death of the spouse (Ref Interview 36+ months before spouse's death)				
24–36 months before	0.917 (0.158)	0.879 (0.132)	1.266 (0.369)	0.753 (0.190)
12–24 months before	0.929 (0.150)	0.876 (0.123)	0.928 (0.268)	0.643* (0.145)
0–12 months before	0.776 (0.132)	0.729** (0.111)	1.050 (0.312)	0.515*** (0.129)
0–12 months after	0.862 (0.142)	0.838 (0.122)	0.619 (0.193)	0.531*** (0.129)
12–24 months after	1.090 (0.189)	1.255 (0.189)	1.090 (0.352)	0.600* (0.163)
24+ months after	1.297 (0.216)	1.554*** (0.231)	0.592 (0.193)	0.702 (0.178)
Age	1.476*** (0.085)	1.493*** (0.080)	1.749*** (0.209)	1.767*** (0.171)
Age squared	0.997*** (0.000)	0.997*** (0.000)	0.996*** (0.001)	0.996*** (0.001)
Health condition				
Being in poor or fair health	0.634*** (0.067)	0.632*** (0.063)	0.766 (0.147)	0.686** (0.111)
At least one ADL or IADL difficulty	0.481*** (0.053)	0.532*** (0.056)	0.601*** (0.118)	0.441*** (0.074)
Labor force status (Ref not in a paid job)				
In paid job	0.902 (0.107)	0.609*** (0.065)	0.666* (0.138)	0.733* (0.125)
Equalised household income (logged)	1.090** (0.047)	1.093** (0.043)	0.957 (0.071)	1.063 (0.083)
Observations	5,384	6,770	1,644	2,385
Number of respondents	649	823	207	303

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table A-3: Probability of doing volunteering last 12 month whatever the death was active in volunteering activities. Stratified by gender. Fixed effect logit models. Odds ratios

Variables	Female		Male	
	Partner no volunteer	Partner volunteer	Partner no volunteer	Partner volunteer
Time before/after death of the spouse				
<i>(Ref Interview 36+ months before spouse's death)</i>				
24–36 months before	0.627*** (0.104)	1.335* (0.229)	1.052 (0.296)	0.828 (0.223)
12–24 months before	0.839 (0.129)	1.005 (0.159)	0.678 (0.179)	0.733 (0.192)
0–12 months before	0.776 (0.122)	0.779 (0.136)	0.873 (0.244)	0.532** (0.148)
0–12 months after	1.185 (0.189)	0.629*** (0.105)	0.818 (0.229)	0.342*** (0.097)
12–24 months after	1.561*** (0.250)	0.940 (0.170)	1.311 (0.395)	0.384*** (0.120)
24+ months after	2.714*** (0.430)	0.760 (0.135)	1.806** (0.516)	0.211*** (0.064)
Age	1.281*** (0.070)	1.573*** (0.096)	1.519*** (0.164)	1.977*** (0.215)
Age squared	0.998*** (0.000)	0.996*** (0.000)	0.997*** (0.001)	0.995*** (0.001)
Health condition				
Being in poor or fair health	0.708*** (0.072)	0.568*** (0.066)	0.620*** (0.107)	0.903 (0.175)
At least one ADL or IADL difficulty	0.524*** (0.058)	0.466*** (0.054)	0.593*** (0.103)	0.429*** (0.084)
Labor force status				
(Ref not in a paid job)				
In paid job	0.626*** (0.069)	0.799* (0.098)	0.659** (0.118)	0.822 (0.168)
Equivalent household income (logged)	1.085** (0.045)	1.079* (0.049)	1.027 (0.074)	0.969 (0.081)
Observations	6,109	5,055	1,995	1,838
Number of respondents	731	604	249	231

Standard errors in parentheses.

We consider the partner a "volunteer" if he/she was involved in volunteering activities in at least one of three years prior to his/her death.

*** p<0.01, ** p<0.05, * p<0.1