Widowhood and Volunteering among older adults: gendered pathways before and after partner's death

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Abstract prepared for PAA2019 Annual Meeting

Abstract

This study investigates gender and socio-demographic differences in pathways of engagement in volunteering activities before and after transition to widowhood.

Losing a spouse is one of the most traumatic events in the life course of an individual. Widowhood is associated with increasing risk of death, higher levels of physiological and mental distress, negative social and economic consequences.

Being socially active is a key predictor towards living longer and healthier lives. Drawing on longitudinal data from the Health and Retirement Study, we investigate rate of adaptation and potential anticipatory effects on the propensity of volunteering before and after spousal loss. We use fixed effects models to account for unobserved individual characteristics and we study how sociodemographic groups differ in their volunteering trajectories.

Results shows a decline in volunteering activities even before the death of the partner and then a slight process of adaptation and recovery. Sociodemographic factors influences such pathways. Women are strongly more resilient than men, and individuals with higher level of education are more likely to quick recovery after bereavement.

INTRODUCTION

The death of the spouse is one of the most traumatic events in the life course of an individual. The majority of the studies have focused on the physiological and psychological distress resulting from spousal loss (Strobe, Hansson, Stroebe, & Schut, 2001). Losing a spouse is associated with increasing risk of death, higher levels of physiological and mental distress, and onset of depressive symptoms (Heinemann & Evans, 1990, Carr & Utz, 2002).

Behavioral changes in response to widowhood have received less attention. This article explores gender differences in change in volunteering, as an important form of formal social participation, among those who experienced widowhood in late-life analyzing the trajectories of volunteering activities before and after spousal loss. Previous studies have analyzed the negative effects of widowhood either cross-sectionally comparing widowed and not-widowed people, or using short prospective study looking at two time points (before and after). Utz et al. (2002) for instance compared widowed persons to continuously married ones looked at change in social participation among 297 individuals over a 6-month period. Using data from the Changing Lives of Older Couples studies, the authors considered two indexes of social participation. An informal social participation index based on the frequency of contacts, either in person or by phone, with friends, neighbors and relatives, and a formal social participation index representing the intensity of participation in religious services and meetings in clubs or association. They found an increase in informal social participation after the loss of a spouse, in particular among women, but no effect on formal social participation. Li (2007) found instead an increase in volunteering after spousal loss. However, Li compared the change only over two points in times and with an elapsed time between observations quite large (3 or 5 years between interviews). Carr et al. (2017) looked at the effect of volunteering on loneliness among late-life widows and widowers within 4-year from spousal loss. The

authors found an attenuation of sense of loneliness among the widowed engaged more than 2 hours per week in volunteering activities.

The current study extends this literature drawing longitudinal data from the Health and Retirement Study (1996-2014) looking at the trajectories of volunteering activities potentially over almost 20 years on a large sample of older adults who lost their spouse (N=4,037). Thanks to the longitudinal nature of the data and the analytic approach applied in this study (longitudinal fixed effect models 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. The paper focused in particular on gender differences in response to spousal loss. Since among older adults being socially active and community engaged are associated with living longer and healthier lives (Morrow-Howell, Hinterlong, Rozario, & Tang, 2003, Carr, Fried & Rowe 2015, Anderson et al. 2014)---the so-called successful aging (Rowe & Kahn, 1998)---this study aims also to identify groups at higher risk of reducing their engagements in social activities and potential mediating factors.

BACKGROUND

Consequences of Widowhood in Later Life

Marriage dissolution is a stressful event usually associated with lower levels of happiness and wellbeing and with negative physical, mental, and economic consequences. It is a loss in terms of loss of resources, both monetary and immaterial (companionship, emotional support), loss of an intimate relationship, loss of a desirable social position. And the death of the spouse, in particular after a long-term relationship, is one of the most critical negative events a person might experience in a life course (e.g. Holmes & Rahe, 1967, Amster & Krauss 1974, Atchley 1975, Stroebe & Stroebe, 1995), .

Several longitudinal studies have looked at the effect of widowhood in terms of change in subjective well-being (SWB) and mental health (see the review by Luhman, Hofmann, Eid & Lucas in 2012 on 22 longitudinal studies on bereavement). The adaptation theory used especially in SWB literature argues that after an event (either positive, like marriage or having a child, or negative, like spouse death or losing a job) there will be a reaction phase, with significant changes in SWB with respect to a baseline moment, followed by an adaptation phase (see seminal work of Brickman and Campbell, 1971). The impact of bereavement on well-being is particularly strong right after the loss and the adaption takes longer than other disruptive events such as the divorce with relevant gender differences (Luhman et al. 2012).

Widowhood can have social effects too. On one side, it might even have positive effects increasing social interactions usually right after the death of the partner (Carr et al., 2018). Being frequently in contact with family members, friends, and neighbors, either by phone or in person, can be a strategy to cope with the loss. On the other side, widowhood might bring to social isolation and have less stimuli in being engaged in social activities.

Widowhood is a multifaceted transition (Carr & Utz, 2002). Variability in the timing and speed of recovery after a loss has been observed in the literature (Bennett 2010; Bonanno, Westphal. & Mancini, 2011). Socio-demographic characteristics and the access to individual resources might be associated with different reaction to spousal loss. In our attempt to assess the different trajectories of volunteering activities before and after the widowhood, we explore gender differences in volunteering trajectories, and how such pathways change according to race, cause of death and level of education of widows and widowers.

Gender differences.

In terms of change in subjective wellbeing, Luhman et al. (2012) found a significant gender effect with women able to adapt faster than men to spousal loss, The health consequences of widowhood are also higher among men than women (see e.g., Stroebe, Stroebe, & Schut 2001). The mechanisms beyond gender-specific differences in responses to late-life widowhood are different

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 & Akiyama, 1987). It has been also hypothesized that since women are more capable than men to create intimate relationships, they would be also able to create faster than men new social relations after spousal loss to help them in coping with the loss (Hatch & Bulcroft, 1992). These might suggest a quicker adaptation to spousal loss among women. However, at the same time, having strong family and social ties might exacerbating the stress due to the loss.

Gender-specific roles might explain such differences in reaction to spousal loss as well. Among women, DeGarmo and Kitson (1996) studying the degree of which divorce or widowhood caused identity confusion among young women found that widowhood was more disruptive to identity than divorce. According to Bennet (2010) 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 the contacts with relatives and friends (i.e., informal social participation) after partner's death or participate in social activities might be a way to reconstruct their identity as an individual in the 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, 2010). Traditional gender division of housework increases spousal dependence among men making them less prepared to widowhood. Losing a spouse might be then less disruptive in the daily routine for a woman than for a man. On the other hand, financial distress resulting from widowhood might have stronger negative effects among women (Lillard and Waite, 1995) in particular in traditional settings where the male partner is the breadwinner. In our sample, this mechanism might be less relevant since we focused on older adults who are likely to be retired or close to retirement age and then usually less affected by income shocks. Therefore, overall we expect women to be more resilient than men and able to recover in their benevolent engagements after a period of bereavement.

Death sudden or not.

In the literature, there is no agreement whatever sudden and unexpected deaths or graduate and anticipated deaths are more difficult to cope with (e.g., Carr & Utz 2002, 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., Steinhauser et al 2000, Holland et al. 2014). Moreover, although a death might be sudden, the widowhood is usually more a process than a definite transition out of marriage in particular if it happens later in life. The processes of becoming a widow or widower might starts years before the event with onset of illness or deterioration in health. The burden of caregiving is associated with physical and mental distress of the caregiver (Pinquart & Sorensen, 2003; Vitalian, Scanlon & Zhang 2003) and women are more likely to report higher negative effects due to caregiving than men (Yee & Schultz, 2000). . The death of the spouse then might be perceived as a relief to the burden of caregiving and mitigate the negative effects associated with spousal loss. At the same time, being a caregiver is also associated with sense of proud and usefulness and the

loss of spouse might exacerbate the negative feelings related to the end of a long-lasting relationship (Boerner, Schultz, & Horowitz, 2004). Since the woman is usually the informal caregiver (Wolff & Kasper 2006), we expect a stronger effect of experiencing a graduate and anticipated loss on social participation prior to the death among women.

Race differences.

Some studies have hypothesized weaker negative effects on wellbeing and mental health for African Americans than Whites after marital disruption. However, these studies focused on divorce rather than widowhood and underlined that these stronger negative effects among Whites were due to higher divorce-related stigma that Whites usually have to face. In this view, race is seen more as a proxy for social and marital norms rather than a risk factor per se.

Looking at the transition to widowhood, no race-specific differences in wellbeing was observed (Gove & Shin 1998). Elwert & Christakis (2006) looked instead at race-specific differences in the so-called "widowhood effect". That is the increased probability of death among those who become widowhood recently (Schaefer, Quesenberry, & Wi, 1995, Hu & Goldman, 1990). Elwert & Christakis (2006) identified high levels of heterogeneity in widowhood trajectories. They found evidence of widowhood effect among endogamously married Whites, but no effect among African Americans. Such differences might be due to different levels of religiosity. In the United States, African Americans are more likely to be engaged in religious activities that might make them more resilient to spouse loss thanks to spiritual and social support.

Volunteering as a form of Social Participation in Later Life

Volunteering is one of the most common forms of social participation across all stages of the life course (Wilson, 2012, Lancee & Radl, 2014) that has been found to produce positive

benefits also for the volunteer and the society as a whole. Among older people, in particular, the benefits of volunteering have been theorized as part of more general models of aging such as successful, active or productive aging (Gottlieb & Gillespie 2008). Active engagement in social activities, such as volunteering or participating into the activities of a club or association, can produce positive effects on older people's health and wellbeing by maintaining both their body and brain active. This has been confirmed by several studies indicating that involvement in social activities contributes slowing down the process of cognitive decline and plays a decisive role in influencing life satisfaction, health, functioning, autonomy and survival (e.g., Carr et al. 2015; Engelhardt et al. 2010; Hultsch et al. 1999; Scarmeas and Stern 2003). Social participation may also increase social networks and give a sense of purpose in life. 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 the others is seen as a way to increase sense of purpose and fulfill the desire to leave a legacy beyond one's life.

Mediators

Two potential mediators on the effect of experiencing widowhood on volunteering activities are considered: household income and depressive symptoms. Widowhood often results in a change, usually a decline, in household income and this might affect negatively the propensity of doing volunteering after spousal loss. We might expect a stronger effect among women in a society like the United States where male breadwinning is still predominant. The mental health is also a potential mediator. Death of the partner can be associated with increase sense of loneliness and onset of depression symptoms and this might affect the propensity of being engaged in volunteering activities.

RESEARCH QUESTIONS

This study addresses the following research questions:

1) What is the pathway of volunteering activities before and after widowhood?
2) Do different groups of individuals react differently to the death of spouse in terms of social participation? In particular, we examine differences in terms of gender, educational attainment, race and if death was expected or not
3) Do changes in household income and depressive symptoms mediate the impact of partner's death on spouse social participation?

DATA

This paper draws on longitudinal data (1996-2014) from the Health and Retirement Study (HRS). The HRS 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 death of 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 individual potentially over almost 20 years.

Pooling together data from 1996 to 2014, we end up with 34,506 individuals aged 50 and older. The present study focuses on the trajectories of volunteering activities before and after spouse's loss, therefore we selected only respondents who experienced widowhood during the follow up period (4,567 individuals). We exclude then those already widowed at first

observation and those who remained married or single during the entire follow up (29,939 respondents). We further exclude those with missing information on volunteering activities (52 individuals) and missing information on the date of death of the spouse (478 individuals).

Our final sample consists of 4,037 individuals (70.97% women) 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 157 months from first to last interview) for a total sample size of 29.937 observations.

Measures

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

The transition to widowhood: timing and type of loss. A key information to reconstruct the pathways of volunteering is the exact timing of the transition to widowhood. Since the survey was 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 death of a participant, HRS collects a set of information in the so-called "HRS Exit/Post-Exit Interview". These information, provided by a proxy of the deceased, usually the partner, include the time of death (month and year) and if the death was expected or not. Since HRS interviewed both couple's members, we were able to match the time of death of the spouse with the time of the interviews. 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 9 levels: if the interview happened: (i) 36+ months before the death (reference category); (ii) 24-36 months before; (iii) 12-24 months before; (iv) 0-12

months before; (v) 0-12 months after the death of the spouse; (vi) 12-18 months after; (vii) 18-24 months after; (viii) 24-36 months after; (ix) 36+ months after.

Health. Deterioration in health and onset of functional limitations might change traditional division of housework and caregiving, and reduce chance of being engaged in community activities. We expect than 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. Self-rated health is a reliable indicator of general level of health (Lundberg and Maderbacka 1996) and a good predictor of elderly 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 self-care daily activities (e.g., personal hygiene, dressing, eating) and/or live independently (e.g., clean house, preparing meals).

Depressive symptoms. HRS measured depressive symptoms using a short version (eight items) of the Centre for Epidemiological Studies Depression Scale (CES-D). CES-D scale (Radloff 1977) reports how often in the last week the respondent had experienced a series of depressive symptoms (e.g. loneliness, sadness, could not get out). The scale reported in HRS ranged from 0 to 8. We used a score of three as cut-off point to define a person as depressed (Schane et al. 2008).

Labor force participation. People still active on the labor market later in life are more socially active and exposed to a larger support network that might positively affect the adjustment after the death of the spouse reducing the sense of loneliness and loss, with gender specific differences (e.g., Nieboer Lindenberg &Ormel, 1998-1999) and increasing

the chance of being engaged in volunteering activities. On the other side, being in a paid job reduces the time available to be engaged in social activities. We include a dummy variable indicating if the respondent was in a paid job at the time of interview.

Other socio-demographic characteristics. We consider in the analysis the following socio-demographic characteristics: age (in linear and quadratic specification), level of educational attainment (at least high school diploma), equalized household income square root scale, , and race/ethnicity. Due to privacy issues and sample size, we had to code race as dummy indicator equal to one if the respondent is Black/African American; 0 otherwise. it was not possible to distinguish further among ethnic groups. Information on the health condition of the partner has been included as well as robustness check.

EMPIRICAL STRATEGY

We apply longitudinal fixed effects (FE) linear models to analyse the trajectories of volunteering activities before and after transition to widowhood.

FE models account for unobserved individual-specific characteristics that might influence the propensity of doing volunteering (e.g., personality traits, religiosity) and eventually being related to the transition to widow (e.g. living in certain areas of the country, specific socio-determinants of health). Accounting for unobservable confounders reduces the bias due to unobserved heterogeneity. The FE model also allows us to control for time-varying factors. In particular, we control for age, labour force status and level of general and functional health of the respondent.

We apply an analytic strategy similar to the approach used by Clark et al (2008) and Myrskyla & Margolis (2014) among others to examine change in subjective well-being around time of relevant life events. The approach consists in using lags and leads in the FE

models to identify anticipation effects, and short- and long-term changes in propensity of doing volunteering before and over the course of bereavement.

The model reads as follows:

$$V_{i,t} = \alpha_i + \boldsymbol{\beta}\left(B_{i,t}^{36+} + B_{i,t}^{24-36} + B_{i,t}^{12-24} + B_{i,t}^{0-12} + A_{i,t}^{0-12} + A_{i,t}^{12-18} + A_{i,t}^{18-24} + A_{i,t}^{24-36} + A_{i,t}^{36+}\right) + \boldsymbol{\gamma X}_{i,t} + \varepsilon_{i,t}$$

Where:

$V_{i,t}$ is the volunteering activities of individual *i* at time *t*; α is the fixed effect, representing time-invariant unobserved individual characteristics; $\boldsymbol{B}$ and $\boldsymbol{A}$ are a series of 9 time dummy indicators representing the change in propensity of doing volunteering activities before and after spousal loss(the reference is if the interview was conducted 36 or more months before the death of the spouse); $\boldsymbol{X}$ is a vector of time-varying covariates.

Although the outcome is a dummy variable, we apply linear probability models both for interpretability purposes (e.g., coefficients can be interpreted in terms of effects on probability of volunteering) and because logit models cannot be estimated if individuals have a constant (all positive or all negative) outcome (i.e., being all the time volunteers or have never been a volunteer over the follow up period).

Since characteristics such as age, health condition, level of health, being in a paid job might be associated with propensity of volunteering and influence the response to spousal loss, we first run the above model controlling for these time-varying characteristics to have an average pattern of change in volunteering activities (*FIGURE 1*). We stratified then by gender (*FIGURE 2*) and race (*FIGURE 3*) to identify gender- or race-specific differences. Afterwards, we estimate gender specific pathways by level of education (FIGURE 4), and if the death was expected or not (*FIGURE 5)* to see if widows and widowers differs in their reactions to spousal loss according to their socio-economic status and type of loss. Finally (FIGURE 6 and FIGURE 7), we

examine potential mediators by comparing models that adjusted for health and income to models that did not adjust for these factors

Estimated regression coefficients for all models are reported also in Appendix.

RESULTS

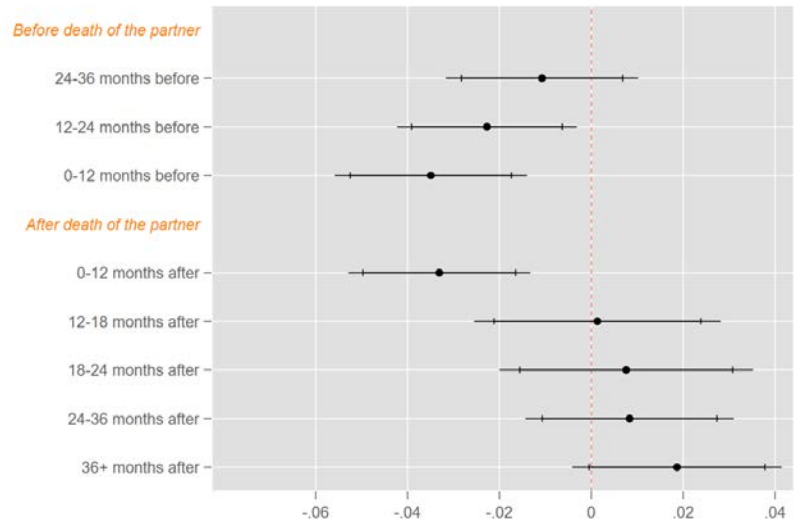
Volunteering Trajectories

The following figures report the estimated propensities of volunteering before and during the course of bereavement. The reference (time) point is 36 or more months before spousal. The coefficients than can be interpreted in terms of percentage change in the probability of volunteering with respect to the situation 3 years before the event. The FE model shows a clear pattern in which the propensity of being engaged in volunteering activities declines, almost linearly, before the death of the spouse (from -0.011 24-36 months before the event to -0.035 the 12 months before spousal loss). Then it remains quite low until 12 months after the event (-0.033), with respect to the propensity of volunteering 3 years before spousal loss, and then we observe a strong recovery with levels higher to the one observed over 36 months before the death (*FIGURE 1*). We observe the lowest engagement right before and right after the event (1 year before and after. Both statistically significant). This average pattern suggests a strong bereavement period that lasts around 12 months in which the person is not engaged in volunteering but also strong anticipation effects with behavioral changes that happen up to 3 years before the event.

With regard to the socio-demographic characteristics considered in the model (Table 1), we found that there is a non-linear association between age of the respondent and propensity of being engaged in volunteering activities (estimated coefficient of 0.04 for age and -0.001 for age squared). Having health difficulties, in terms of onset of at least one functional limitation

(-0.071) or degradation in general health (-0.045, being in poor or fair self-rated health status) reduce the probability of doing volunteering of 7.1 and 4.5 percentage points respectively. Finally, those who are still engaged in labour force, probably due to time constraint, are less likely to be engaged in volunteering activities by 3.2 percentage points (-0.032).

FIGURE 1. PROPENSITY OF DOING VOLUNTEERING ACTIVITIES BEFORE AND AFTER DEATH OF THE SPOUSE



Note: Confidence Intervals at 90% and 95%.
Time indicators are the differences in months between date of interview and date of death.
Reference category: interview happened 36+ months before spousal loss.
Model account for age, health and working condition

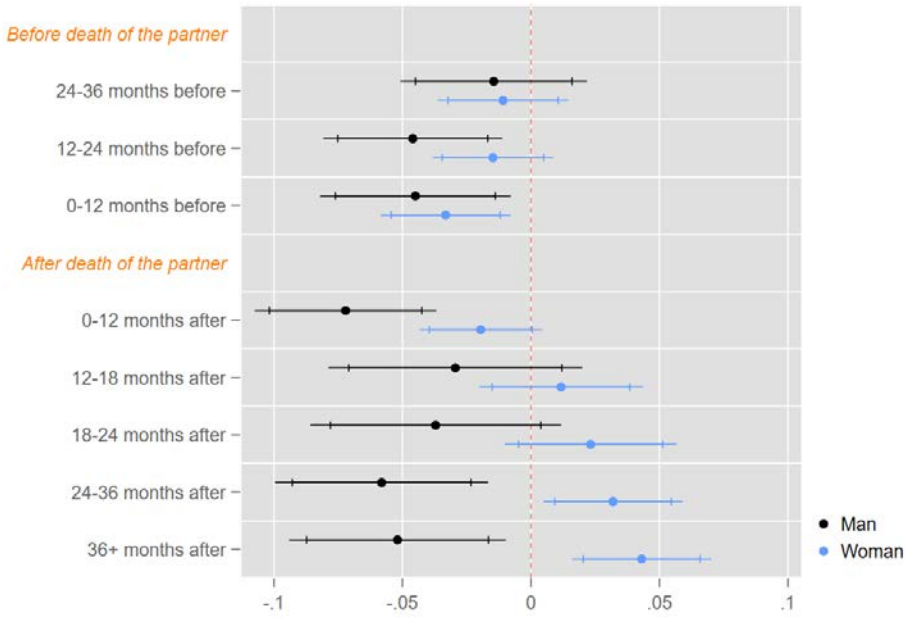
Gender differences in volunteering trajectories.

FIGURE 2 illustrates gender differences in volunteering trajectories in response to spousal loss. As expected, women are more resilient than men.

For both men and women, an anticipation effect is observed with the propensity of doing volunteering declining before the event. Such reduction in social participation is stronger among men. For instance 12-24 months prior to spouse loss, the probability of doing volunteering declines of 5 percentage points among men and of 1.5 points among woman.

Among women, after a bereavement period of 12 months characterized by low engagement, the propensity of doing volunteering activities recover to levels higher than the one observed 3 years prior to the event. Such recovery is instead not observed among men. These results are consisted with the theory that men are highly dependent to their spouses also in terms of engagement and social support and therefore more affected to spousal loss.

FIGURE 2. PROPENSITY OF DOING VOLUNTEERING ACTIVITIES BEFORE AND AFTER DEATH OF THE SPOUSE BY GENDER.



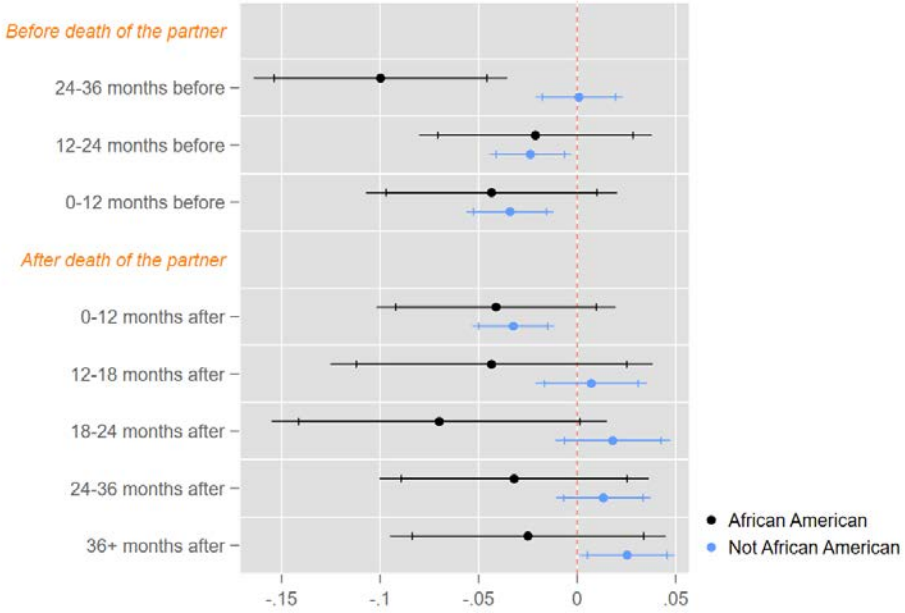
Note: Confidence Intervals at 90% and 95%.
Time indicators are the differences in months between date of interview and date of death.
Reference category: interview happened 36+ months before spousal loss.

Race differences in volunteering trajectories.

FIGURE 3 shows volunteering trajectories by race. Not African Americans seem to be more resilient with a faster adaptation after the death of the spouse. It is important to notice that the confidence intervals of the coefficients estimated for African Americans are larger than then one estimated for not African Americans due to differences in sample size. In our analytic

sample only 490 respondents over 4,037 (12.77%) identified themselves as Black/African Americans. Consequently, we decided to do not reported the analysis stratified by gender. Due to sample size, we also decided to do not distinguish between racial endogamy and heterogamy marriages.

FIGURE 3. PROPENSITY OF DOING VOLUNTEERING ACTIVITY BEFORE AND AFTER DEATH OF THE SPOUSE BY RACE



Note: Confidence Intervals at 90% and 95%.
Time indicators are the differences in months between date of interview and date of death.
Reference category: interview happened 36+ months before spousal loss.

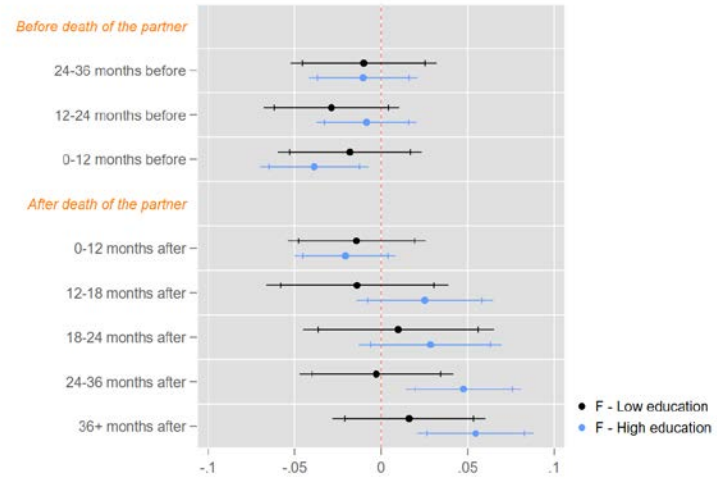
Volunteering trajectories by educational attainment.

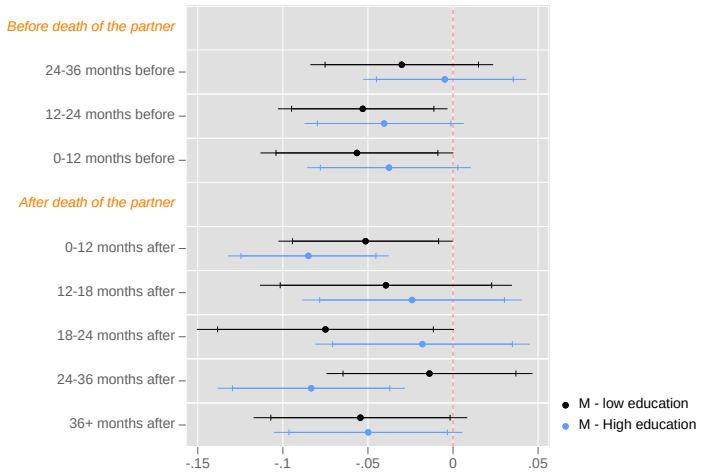
Differences in trajectories by educational attainment are reported in FIGURE 4. Since we have observed strong gender differences in the overall pathways, we estimated different trajectories for widows and widowers. Not surprisingly, overall highly educated individuals were more likely to be engaged in volunteering activities (see e,g,, Musick, & Wilson 2008)

Among women, we observe clear SES-related effects. Highly educated woman (with at least a high school diploma), who typically have accumulated and have access to higher socioeconomic resources, recovered faster and anticipation effects seem to be less strong than the one observed for those with a low level of education. However, this pattern changes right before and right after the death of the spouse with higher educated women more affected by widowhood. Up to one year before the event, the propensity of doing volunteering reduced of 4 percentage points (-0.0387) among highly educated women and of 1.8 points (-0.0181) for low educated women. In the 12 months after experiencing the widowhood, the estimated effects are respectively -0.0207 and -0.0142.

The pattern is instead less clear among men with few differences according to the socio-economic status. As observed for the overall male sample, men are not able to recover in terms of volunteering activities after spousal loss regardless their level of education.

FIGURE 4. PROPENSITY OF DOING VOLUNTEERING ACTIVITY BEFORE AND AFTER DEATH OF THE SPOUSE BY LEVEL OF EDUCATION AND GENDER. TOP PANEL: WOMEN TRAJECTORIES. BOTTOM PANEL: TRAJECTORIES AMONG MEN



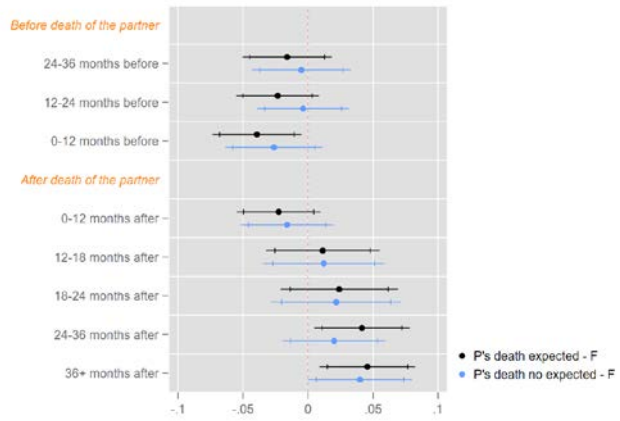


Note: Confidence Intervals at 90% and 95%.
Time indicators are the differences in months between date of interview and date of death.
Reference category: interview happened 36+ months before spousal loss. Women trajectories reported in top panel.

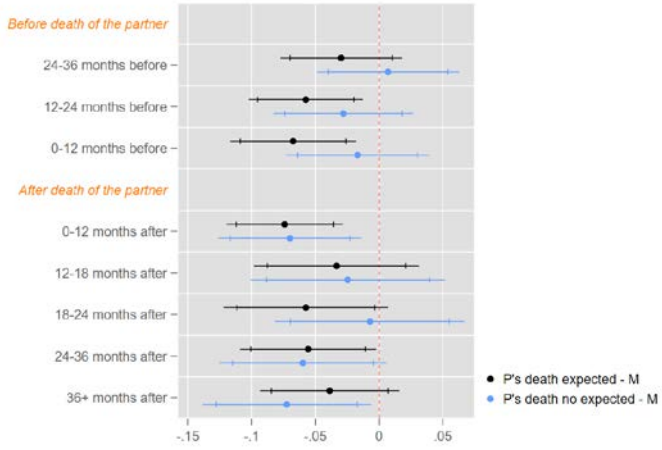
Volunteering trajectories whatever the death was expected or not

Results reported in FIGURE 5 shows that for both genders, if the death was expected, the social participation of widows and widowers declines faster prior to the event (anticipation effects) probably 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 then reduce the propensity of being engaged in volunteering activities before the event. This effect is stronger among men. For instance, up to a year before experiencing the widowhood, the propensity of doing volunteering declined of 7.4 percentage points if the death is expected, by 1.7 point if instead it was unexpected. Among women the difference was only of 1.3 points (-0.039 if death was expected, -0.026 if not). These results support our hypothesis that anticipations effects are linked to the burden of caregiving and gender specific roles in the household. Men, who are traditionally less engaged in housework and caregiving, might need to reduce massively their engagement in social activities only if they have to start taking care of the house and of a disabled partner.

FIGURE 5. PROPENSITY OF DOING VOLUNTEERING ACTIVITY BEFORE AND AFTER DEATH OF THE SPOUSE IF THE DEATH WAS EXPECTED OR NOT BY GENDER. FEMALE PATHWAYS REPORTED TOP PANEL.



Note: Confidence Intervals at 90% and 95%.
Time indicators are the differences in months between date of interview and date of death.
Reference category: interview happened 36+ months before spousal loss. Women trajectories reported in top panel.



Note: Confidence Intervals at 90% and 95%.
Time indicators are the differences in months between date of interview and date of death.
Reference category: interview happened 36+ months before spousal loss. Women trajectories reported in top panel.

Mediating factor

We examine whatever changes in income and in depressive status mediate the link between spousal loss and volunteering trajectories. We compare the results with and without such

time-varying mediating factors. For both men and women, the pathways of engagement in volunteering activities before and after spousal loss were very similar (see FIGURE 6 and FIGURE 7 in Appendix) suggesting that the effect of becoming widow or widower on being socially engaged is not mediated by changes in mental health or income level. Controlling for depressive symptoms allows to explain only marginally the lower propensity of being engaged on volunteering activities among men after spousal loss.

SENSITIVITY ANALYSIS

We conducted several robustness checks.

This study considers volunteering as a dummy variable. Due to change in the formulation of the possible responds, it is not possible to measure volunteering using a continuous scale in terms of hours spent in such activities during the entire follow-up period. Although a measure of engagement in volunteering activities exists in HRS[1], due to the arbitrariness of the thresholds and since the engagement over 100h was quite uncommon in our sample (10.64 % of cases), we decided to use a dummy variable comparing those who were engaged in volunteering and those who were not. Nevertheless, as sensitivity analysis, we estimated the key model with two different specification of the outcome variable: a) using a dummy variable equal to 1 if the person was highly engaged in volunteering (more than 100h), 0 otherwise; b) using the three levels as a continuous variable. 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 afterwards (see Figures in Appendix). We also tested an additional

[1] Three levels of engagement: "No engagement" = 0 hours spent doing volunteering, "engagement" = 1-99h per year, 100-199h per year, and "high level of engagement" = 200 and more h per year.

model using a logistic model rather than a linear specification used. The results remain the same.

We study the change in propensity in doing volunteering including nine dummy variables representing different time before/after death of the spouse. We tested other model specifications reducing the number of dummies. The patterns remain similar over the different specifications (available from the authors upon request).

To reduce bias due to unobservable cofounders, the study applied fixed effect models. We compared our results with those obtained using Random Effect models (RE). The Hausamann test rejected clearly the RE specification, therefore we reported only the results of the FE models (results of the RE model are available upon request).

We used information on the death of spouse as an indicator of health condition of the deceases and potentially the care giving activities of the spouse. Information on actual care giving activities was not available in all waves. As robustness check, we used the self-rated health condition the wave prior to the death (i.e., the health condition of the partner up to 2 years prior to his/her death). The trajectories reported in Appendix (*Figure 12*) 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 represent as well how the respondent has 'perceived' the event of losing his or her long lasting partner rather than a simply measure of the health condition prior to the death. The psychologically consequences of experiencing a loss that haven been perceived as sudden rather than anticipate might differ and influence differently the propensity of being engaged in social activities afterwards.

DISCUSSION

This study examined the propensity of being engaged in volunteering activities before and after spousal loss. We identify gender specific pathways with women more resilient than men and keen on staying socially active after a period of bereavement. We also identify specific trajectories according to the reason of death and socio-demographic characteristics of widows and widowers.

The study of reactions to spousal loss is particularly relevant in the modern nuclear society. Individuals, in particular in countries like the United States, have few economic, emotional, and social supports outside the nuclear family. Then the loss of a long-standing companion becomes particularly difficult to cope with and with relevant consequences. In particular, among older adults being engaged in social activities is at the same time a potential coping strategy and a way to keep good levels of physical and mental health.

This work improves the knowledge on the reaction of traumatic events during the life course. The majority of the literature focused on the psychological effects of spousal loss or looked at the change in behavior between two points in time or over a narrow time window. In this work instead, applying a fixed effect model with lags and leads, we are 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 able to look over a long time span (potentially up to 20 years) and have information on the cause of the death. The results show that if the death was expected, the social participation of widows and widowers declines faster prior to the event (anticipation effects) probably due to the burden of taking care of a sick partner. As far as we know, no prior studies have attempted to link how the perception of the lost affected social participation.

FUNDING AND ACKNOWLEDGMENTS

This paper uses unit record data from the Health and Retirement Study. The HRS (Health and Retirement Study) is sponsored by the National Institute on Aging (grant number NIA U01AG009740) and is conducted by the University of Michigan.

Danilo Bolano is grateful to the Swiss National Science Foundation for its financial assistance (Grant 51NF40-160590).

Bruno Arpino acknowledges funding from the Spanish Ministry of Economy, Industry and Competitiveness (PCIN-2016-005) within the second Joint Programming Initiative “More Years Better Lives”.

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APPENDIX

Regression Tables

Table 1. *Propensity of doing volunteering last 12 months. Fixed effect linear models*

	Entire sample	GENDER		RACE	
VARIABLES		Female	Male	Black	No black
Time before/after death of the spouse					
(Ref Interview 36+ months before spouse's death)					
24-36 months before	-0.0107	-0.0109	-0.0145	-0.0998***	0.000902
	(0.0107)	(0.0130)	(0.0185)	(0.0328)	(0.0113)
12-24 months before	-0.0227**	-0.0148	-0.0460***	-0.0211	-0.0237**
	(0.00997)	(0.0120)	(0.0177)	(0.0301)	(0.0106)
0-12 months before	-0.0349***	-0.0332**	-0.0450**	-0.0434	-0.0341***
	(0.0107)	(0.0129)	(0.0189)	(0.0325)	(0.0113)
0-12 months after	-0.0331***	-0.0196	-0.0721***	-0.0412	-0.0324***
	(0.0101)	(0.0122)	(0.0180)	(0.0309)	(0.0107)
12-18 months after	0.00134	0.0117	-0.0294	-0.0434	0.00718
	(0.0137)	(0.0163)	(0.0252)	(0.0417)	(0.0145)
18-24 months after	0.00761	0.0232	-0.0371	-0.0700	0.0181
	(0.0141)	(0.0171)	(0.0249)	(0.0434)	(0.0149)
24-36 months after	0.00835	0.0319**	-0.0581***	-0.0320	0.0133
	(0.0116)	(0.0138)	(0.0211)	(0.0348)	(0.0122)
36+ months after	0.0187	0.0431***	-0.0519**	-0.0250	0.0254**
	(0.0116)	(0.0138)	(0.0215)	(0.0357)	(0.0123)
Age of respondent					
Age	0.0442***	0.0416***	0.0517***	0.0370***	0.0468***
	(0.00352)	(0.00415)	(0.00683)	(0.0111)	(0.00372)
Age squared	-0.00035***	-0.00035***	-0.000381***	-0.000315***	-0.000372***
	(2.43e-05)	(2.88e-05)	(4.63e-05)	(7.81e-05)	(2.56e-05)
Health condition					
Being in poor or fair health	-0.0454***	-0.0523***	-0.0283**	-0.0526***	-0.0447***
	(0.00633)	(0.00769)	(0.0110)	(0.0173)	(0.00681)
At least one ADL or IADL difficulty	-0.0706***	-0.0735***	-0.0627***	-0.0793***	-0.0686***
	(0.00664)	(0.00809)	(0.0115)	(0.0193)	(0.00708)
Labour force status					
(Ref not in a paid job)					
In paid job	-0.0316***	-0.0296***	-0.0357***	-0.0108	-0.0359***
	(0.00759)	(0.00928)	(0.0132)	(0.0212)	(0.00814)
Constant	-0.955***	-0.813***	-1.378***	-0.630	-1.057***
	(0.130)	(0.152)	(0.257)	(0.401)	(0.138)
Observations	29,937	21,701	8,236	3,619	26,318
R-squared	0.034	0.033	0.040	0.043	0.034
Number of respondents	4,037	2,865	1,172	490	3,547

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1
Low educational attainment = below high school
Respondent aged 50+. Only those who become widow

Table 2. *Propensity of doing volunteering last 12 month by gender and education attainment. Fixed effect linear models*

	Entire sample		Female		Male	
VARIABLES	Low Education	High education	Low Education	High education	Low Education	High education
Time before/after death of the spouse						
(Ref Interview 36+ months before spouse's death)						
24-36 months before	-0.0155	-0.00771	-0.0101	-0.0105	-0.0301	-0.00482
	(0.0170)	(0.0135)	(0.0216)	(0.0161)	(0.0274)	(0.0244)
12-24 months before	-0.0361**	-0.0158	-0.0288	-0.00849	-0.0531**	-0.0405*
	(0.0158)	(0.0126)	(0.0200)	(0.0148)	(0.0254)	(0.0238)
0-12 months before	-0.0290*	-0.0366***	-0.0181	-0.0387**	-0.0565*	-0.0376
	(0.0171)	(0.0134)	(0.0212)	(0.0160)	(0.0289)	(0.0245)
0-12 months after	-0.0252	-0.0359***	-0.0142	-0.0207	-0.0514**	-0.0850***
	(0.0161)	(0.0127)	(0.0204)	(0.0150)	(0.0261)	(0.0241)
12-18 months after	-0.0209	0.0132	-0.0139	0.0252	-0.0394	-0.0241
	(0.0219)	(0.0172)	(0.0269)	(0.0201)	(0.0378)	(0.0330)
18-24 months after	-0.0152	0.0177	0.00993	0.0284	-0.0750*	-0.0180
	(0.0227)	(0.0177)	(0.0281)	(0.0211)	(0.0385)	(0.0321)
24-36 months after	-0.00482	0.0153	-0.00281	0.0476***	-0.0139	-0.0834***
	(0.0183)	(0.0146)	(0.0226)	(0.0171)	(0.0309)	(0.0281)
36+ months after	-0.00442	0.0293**	0.0161	0.0546***	-0.0544*	-0.0499*
	(0.0184)	(0.0147)	(0.0226)	(0.0172)	(0.0320)	(0.0283)
SOCIO-DEMOGRAPHICS						
Age of respondent	0.0197***	0.0533***	0.0173**	0.0503***	0.0262**	0.0624***
Age	(0.00583)	(0.00436)	(0.00704)	(0.00508)	(0.0107)	(0.00877)
	-	-	-0.000175***	-0.000407***	-0.000207***	-0.000453***
	0.000184***	0.000418***				
Age squared	(4.03e-05)	(3.01e-05)	(4.88e-05)	(3.52e-05)	(7.32e-05)	(5.93e-05)
Health condition	-0.0219**	-0.0592***	-0.0198*	-0.0702***	-0.0251*	-0.0282*
Being in poor or fair health	(0.00897)	(0.00852)	(0.0113)	(0.0101)	(0.0145)	(0.0158)
	-0.0340***	-0.0909***	-0.0390***	-0.0902***	-0.0250	-0.0903***
At least one ADL or IADL difficulty	(0.00978)	(0.00872)	(0.0124)	(0.0104)	(0.0158)	(0.0159)
Labour force status						
(Ref not in a paid job)						
In paid job	-0.0349***	-0.0288***	-0.0415**	-0.0246**	-0.0197	-0.0423**
	(0.0127)	(0.00936)	(0.0165)	(0.0112)	(0.0199)	(0.0173)
Constant	-0.226	-1.225***	-0.0989	-1.072***	-0.572	-1.708***
	(0.214)	(0.161)	(0.257)	(0.186)	(0.399)	(0.332)
Observations	9,313	20,624	6,362	15,339	2,951	5,285
R-squared	0.024	0.040	0.023	0.039	0.029	0.049
Number of respondents	1,300	2,737	861	2,004	439	733

Standard errors in parentheses
High level of education defined as having at least high school diploma
*** p<0.01, ** p<0.05, * p<0.1

Table 3. *Propensity of doing volunteering last 12 month by gender and if death was expected or not. Fixed effect linear models*

VARIABLES	Entire sample		Female		Male	
	Death expected	Death no expected	Death expected	Death no expected	Death expected	Death no expected
Time before/after death of the spouse						
(Ref Interview 36+ months before spouse's death)						
24-36 months before	-0.0190	-0.000256	-0.0161	-0.00515	-0.0298	0.00695
	(0.0142)	(0.0162)	(0.0175)	(0.0195)	(0.0244)	(0.0285)
12-24 months before	-0.0327**	-0.00889	-0.0233	-0.00377	-0.0575**	-0.0280
	(0.0133)	(0.0151)	(0.0162)	(0.0179)	(0.0229)	(0.0280)
0-12 months before	-0.0468***	-0.0206	-0.0394**	-0.0263	-0.0675***	-0.0170
	(0.0144)	(0.0160)	(0.0174)	(0.0192)	(0.0252)	(0.0286)
0-12 months after	-0.0368***	-0.0279*	-0.0226	-0.0161	-0.0740***	-0.0699**
	(0.0134)	(0.0154)	(0.0164)	(0.0182)	(0.0232)	(0.0286)
12-18 months after	-0.00102	0.00433	0.0113	0.0121	-0.0334	-0.0245
	(0.0185)	(0.0203)	(0.0223)	(0.0238)	(0.0331)	(0.0389)
18-24 months after	0.00115	0.0156	0.0240	0.0216	-0.0575*	-0.00726
	(0.0189)	(0.0212)	(0.0230)	(0.0255)	(0.0330)	(0.0379)
24-36 months after	0.0137	0.00129	0.0415**	0.0200	-0.0557**	-0.0597*
	(0.0155)	(0.0174)	(0.0188)	(0.0204)	(0.0273)	(0.0335)
36+ months after	0.0221	0.0144	0.0457**	0.0400*	-0.0387	-0.0725**
	(0.0156)	(0.0175)	(0.0188)	(0.0205)	(0.0279)	(0.0338)
SOCIO-DEMOGRAPHICS						
Age of respondent						
Age	0.0443***	0.0442***	0.0402***	0.0428***	0.0561***	0.0454***
	(0.00476)	(0.00525)	(0.00569)	(0.00608)	(0.00889)	(0.0107)
Age squared	-0.000360***	-0.000351***	-0.000344***	-0.000346***	-0.000410***	-0.000341***
	(3.27e-05)	(3.64e-05)	(3.93e-05)	(4.24e-05)	(6.02e-05)	(7.29e-05)
Health condition						
Being in poor or fair health	-0.0464***	-0.0445***	-0.0511***	-0.0537***	-0.0356**	-0.0195
	(0.00861)	(0.00936)	(0.0106)	(0.0112)	(0.0147)	(0.0167)
At least one ADL or IADL difficulty	-0.0687***	-0.0728***	-0.0663***	-0.0815***	-0.0715***	-0.0498***
	(0.00901)	(0.00984)	(0.0112)	(0.0118)	(0.0151)	(0.0177)
Labour force status						
(Ref not in a paid job)						
In paid job	-0.0435***	-0.0172	-0.0505***	-0.00620	-0.0277	-0.0490**
	(0.0103)	(0.0113)	(0.0128)	(0.0135)	(0.0172)	(0.0206)
Constant	-0.928***	-0.997***	-0.726***	-0.901***	-1.523***	-1.172***
	(0.177)	(0.192)	(0.210)	(0.221)	(0.336)	(0.401)
Observations	16,869	13,068	11,940	9,761	4,929	3,307
R-squared	0.036	0.032	0.035	0.032	0.043	0.039
Number of respondents	2,277	1,760	1,587	1,278	690	482

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

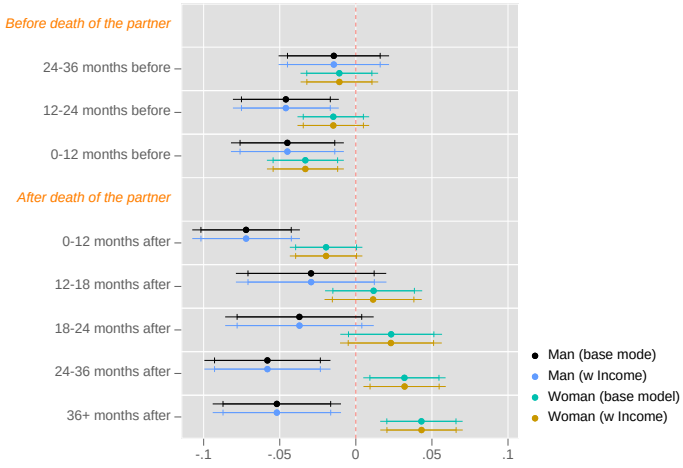
Mediating Factors

Table 4. *Propensity of doing volunteering last 12 month – mediating factors Fixed effect linear models*

	Female			Male		
VARIABLES	Base model	Income	Depression	Base model	Income	Depression
24-36 months before	-0.0109	-0.0108	-0.0108	-0.0145	-0.0145	-0.0142
	(0.0130)	(0.0130)	(0.0130)	(0.0185)	(0.0185)	(0.0185)
12-24 months before	-0.0148	-0.0148	-0.0147	-0.0460***	-0.0460***	-0.0458***
	(0.0120)	(0.0120)	(0.0120)	(0.0177)	(0.0177)	(0.0177)
0-12 months before	-0.0332**	-0.0332**	-0.0330**	-0.0450**	-0.0450**	-0.0443**
	(0.0129)	(0.0129)	(0.0129)	(0.0189)	(0.0189)	(0.0189)
0-12 months after	-0.0196	-0.0195	-0.0190	-0.0721***	-0.0721***	-0.0683***
	(0.0122)	(0.0122)	(0.0123)	(0.0180)	(0.0180)	(0.0183)
12-18 months after	0.0117	0.0114	0.0120	-0.0294	-0.0294	-0.0263
	(0.0163)	(0.0163)	(0.0163)	(0.0252)	(0.0252)	(0.0253)
18-24 months after	0.0232	0.0230	0.0234	-0.0371	-0.0370	-0.0356
	(0.0171)	(0.0171)	(0.0171)	(0.0249)	(0.0249)	(0.0249)
24-36 months after	0.0319**	0.0320**	0.0321**	-0.0581***	-0.0581***	-0.0571***
	(0.0138)	(0.0138)	(0.0138)	(0.0211)	(0.0211)	(0.0211)
36+ months after	0.0431***	0.0432***	0.0432***	-0.0519**	-0.0519**	-0.0515**
	(0.0138)	(0.0138)	(0.0138)	(0.0215)	(0.0215)	(0.0215)
MEDIATING FACTOR						
Equivalised household income sqrt		2.96e-08			-4.94e-09	
		(3.88e-08)			(8.44e-08)	
Depressive status Ref (No Depressed: CES-D8 score <3)						
Depressed			-0.00224			-0.0152
			(0.00704)			(0.0114)
SOCIO-DEMOGRAPHIC CHARACTERISTICS						
Age	0.0416***	0.0415***	0.0416***	0.0517***	0.0517***	0.0517***
	(0.00415)	(0.00415)	(0.00415)	(0.00683)	(0.00683)	(0.00683)
Age squared	-0.000346***	-0.000346***	-0.000346***	-0.000381***	-0.000381***	-0.000381***
	(2.88e-05)	(2.88e-05)	(2.88e-05)	(4.63e-05)	(4.63e-05)	(4.63e-05)
Being in poor or fair health	-0.0523***	-0.0523***	-0.0521***	-0.0283**	-0.0282**	-0.0272**
	(0.00769)	(0.00769)	(0.00771)	(0.0110)	(0.0110)	(0.0111)
At least one ADL or IADL difficulty	-0.0735***	-0.0735***	-0.0734***	-0.0627***	-0.0627***	-0.0617***
	(0.00809)	(0.00809)	(0.00810)	(0.0115)	(0.0115)	(0.0115)
In paid job	-0.0296***	-0.0298***	-0.0297***	-0.0357***	-0.0356***	-0.0358***
	(0.00928)	(0.00929)	(0.00929)	(0.0132)	(0.0132)	(0.0132)
Equivalised household income sqrt		2.96e-08			-4.94e-09	
		(3.88e-08)			(8.44e-08)	
Depressed if CES-D8 score 3+			-0.00224			-0.0152
			(0.00704)			(0.0114)
Constant	-0.813***	-0.812***	-0.813***	-1.378***	-1.378***	-1.376***
	(0.152)	(0.152)	(0.152)	(0.257)	(0.257)	(0.257)
Observations	21,701	21,701	21,701	8,236	8,236	8,236
R-squared	0.033	0.033	0.033	0.040	0.040	0.040
Number of individuals	2,865	2,865	2,865	1,172	1,172	1,172

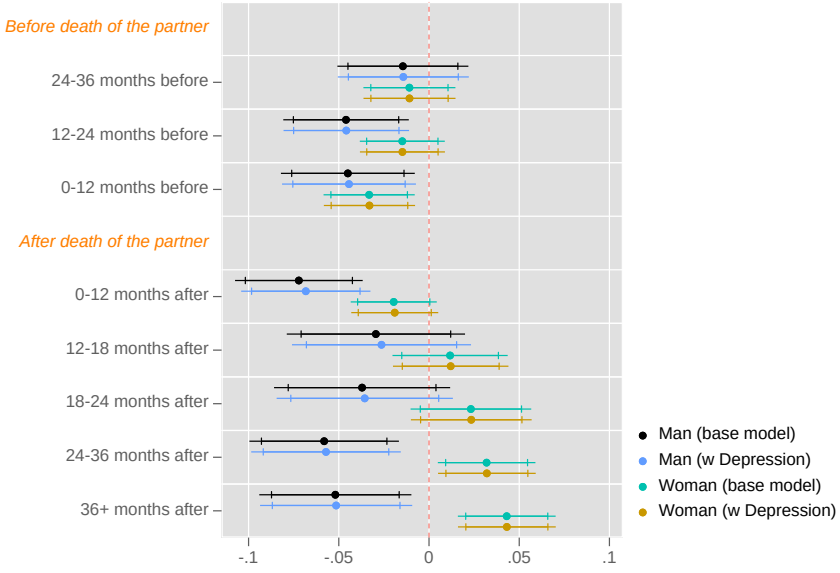
Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1
Income refers to the equivalised household income square root

FIGURE 6. COMPARING PROPENSITY OF DOING VOLUNTEERING ACTIVITY BEFORE AND AFTER DEATH OF THE SPOUSE WITH AND WITHOUT ACCOUNTING FOR HOUSEHOLD INCOME LEVEL.



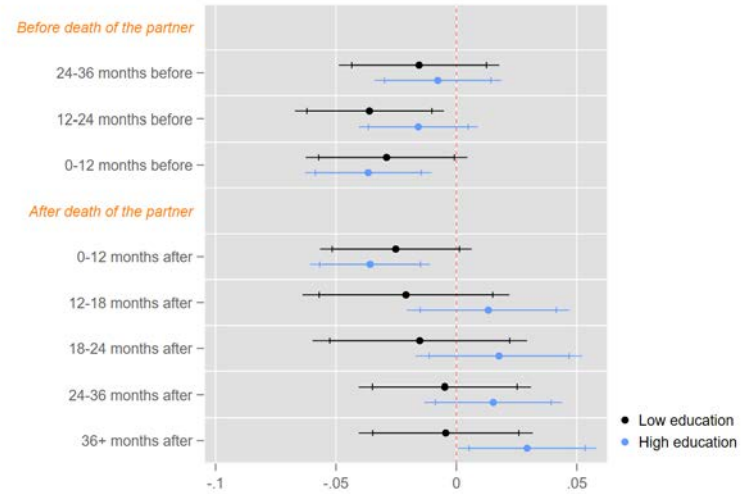
Note: Confidence Intervals at 90% and 95%.
Time indicators are the differences in months between date of interview and date of death.
Reference category: interview happened 36+ months before spousal loss. Women trajectories reported in top panel.

FIGURE 7. COMPARING PROPENSITY OF DOING VOLUNTEERING ACTIVITY BEFORE AND AFTER DEATH OF THE SPOUSE WITH AND WITHOUT ACCOUNTING FOR DEPRESSIVE SYMPTOMS.



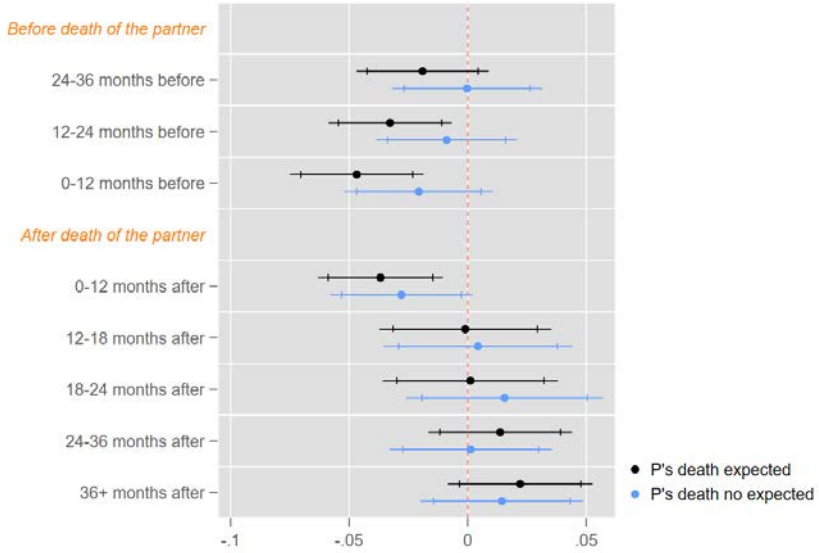
Note: Confidence Intervals at 90% and 95%.
Time indicators are the differences in months between date of interview and date of death.
Reference category: interview happened 36+ months before spousal loss. Women trajectories reported in top panel.

FIGURE 8. PROPENSITY OF DOING VOLUNTEERING ACTIVITY BEFORE AND AFTER DEATH OF THE SPOUSE BY LEVEL OF EDUCATION



Note: Confidence Intervals at 90% and 95%.
Time indicators are the differences in months between date of interview and date of death.
Reference category: interview happened 36+ months before spousal loss.

FIGURE 9. PROPENSITY OF DOING VOLUNTEERING ACTIVITY BEFORE AND AFTER DEATH OF THE SPOUSE IF THE DEATH WAS EXPECTED OR NOT



Note: Confidence Intervals at 90% and 95%.
Time indicators are the differences in months between date of interview and date of death.
Reference category: interview happened 36+ months before spousal loss.

ROBUSTNESS CHECK

FIGURE 10. PROPENSITY OF HIGH ENGAGEMENT (100H+) IN VOLUNTEERING ACTIVITIES BEFORE AND AFTER DEATH OF THE SPOUSE

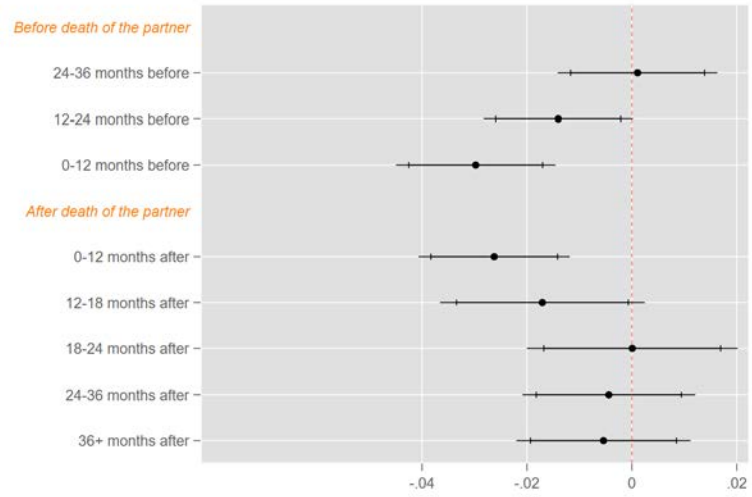
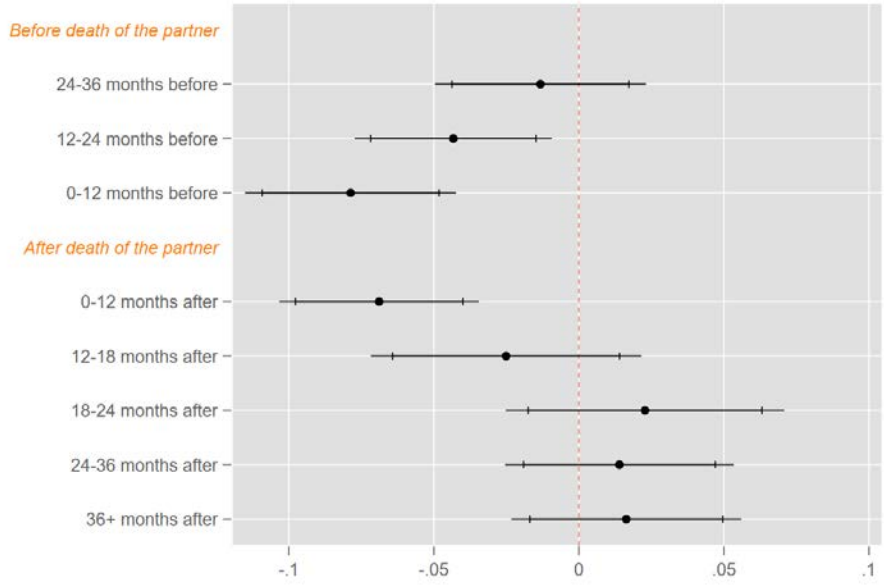


FIGURE 11. PROPENSITY OF ENGAGEMENT IN VOLUNTEERING ACTIVITIES BEFORE AND AFTER DEATH OF THE SPOUSE.



Note: three levels of engagement (no engagement, 1-100h per year; 200+ year). Linear model

FIGURE 12. COMPARING TRAJECTORIES USING PARTNER'S SELF-RATED HEALTH (LEFT PANEL) AND INFORMATION ON DEATH IF SUDDEN OR NOT (RIGHT PANEL AND REPORTED IN THE MAIN TEXT)