



ELSEVIER

Contents lists available at ScienceDirect

The Journal of the Economics of Ageing

journal homepage: www.elsevier.com/locate/jeoa

Gender differences in widowhood in the short-run and long-run: Financial, emotional, and mental wellbeing

Jialu L. Streeter

Research Scholar, Stanford Center on Longevity, Stanford University, 365 Lasuen St, Littlefield Management Center, Rm 354, Stanford, CA 94305, United States

ARTICLE INFO

Keywords:

Emotional and mental wellbeing
Financial security
Gender difference
Bereavement

ABSTRACT

The vast majority of studies of the widowed have concentrated on women. Less is known about whether differences in financial and emotional wellbeing after bereavement vary systematically with the gender of the surviving spouse. This paper analyzes the consequences of widowhood on the economic resources and emotional and mental stability of men and women in the United States. Data are from the 1992–2016 waves of the Health and Retirement Study (HRS). A panel fixed-effect model is adopted to estimate the impact of widowhood on household size-adjusted income, family wealth, affects, and somatic symptoms.

The results show that though both men and women are negatively impacted by widowhood, the areas of impact vary across gender. Women's financial security and men's mental health deteriorate as a direct result of spousal losses. Women experience a 22% income reduction and a 10% wealth loss in the first two years after losing a spouse. In subsequent years, widows continue to decumulate wealth to supplement income. In contrast, men's financial conditions stay relatively stable, but their emotional and mental health conditions worsen sharply in widowhood due to rising rates of loneliness, depression, and sadness. The results bear strong policy implications for retirement planning, survivor benefits, financial education, and public awareness of the psychological wellbeing of widowed individuals.

Background and objectives

Bereavement is a highly stressful life event for the surviving spouse. Economically, the widowed must face financial challenges and make critical decisions independently. Tasks ranging from retirement planning, online banking, to wealth management can be daunting for those who had previously turned to their spouse for help. Mentally, the widowed mourn for the loss of their spouse, the source of love, care, comfort, and social-emotional support. Many studies have used longitudinal data to study the impacts of widowhood on financial security and mental health, but this paper is unique in examining both outcomes to account for their relative risks for men and women, in the short-run and long-run.

Widows on average are less financially secure than their married counterparts (Angel et al., 2007; Bound et al., 1991; Carr, 2004; Holden et al., 1988; Holden and Kuo, 1996; McGarry and Schoeni, 2005; Smith and Zick, 1986; Zick and Smith, 1986, 1991; Hurd and Wise, 1987; Shuart et al., 2010). Moreover, compared to pre-widowhood, women's living standards decline after the death of their spouses (Bound et al., 1991; Zick and Smith, 1991). Many factors contribute to widows' financial insecurity. A good deal of family wealth is lost when the husband dies due to medical spending and funeral costs (Zick and Holden,

2000). Women generally have a lower lifetime income and are less engaged in retirement planning (Lusardi and Mitchell, 2008). A mismatch exists between life insurance holdings and underlying financial vulnerabilities (Bernheim et al., 2001). The husbands' mortality correlates strongly with their lifetime health and income. Therefore, women widowed at a younger age are often poor long before the death of their husbands (Weir et al., 2002).

A few papers that focus on psychological conditions of the widowed contend that men suffer more than women in widowhood regarding mental health and emotional wellbeing (Lee et al., 2001; Sasson and Umberson, 2014; Stroebe and Stroebe, 1983, 1987). In particular, widowers tend to be lonelier (Peters and Liefbroer, 1997) and more depressed (Parkes and Brown, 1972; Radloff, 1975; Umberson et al., 1992) than widows. However, most of the findings are driven by the short-run differences observed between widows and widowers.

To my knowledge, no studies have used longitudinal data to investigate the relative risks to *both* financial security and emotional/mental health of widowed men and women. This paper aims at filling that gap by examining the consequences of widowhood on the economic resources as well as psychological conditions of widowed individuals in the US, using the longitudinal data from the Health and Retirement Study (HRS) between 1992 and 2016. A factor analysis is

E-mail address: jialu.streeter@stanford.edu.

<https://doi.org/10.1016/j.jeoa.2020.100258>

Available online 18 April 2020

2212-828X/ © 2020 Elsevier B.V. All rights reserved.

used to identify the underlying constructs for the eight mental health challenges. An event-study framework is used to empirically quantify the impact of spousal loss at different milestones in widowhood.

Several interesting findings emerge. First, compared to pre-widowhood levels, women's household size-adjusted income falls by about 22% after their husbands' death. The income loss is mainly attributed to cuts in pension income and the Social Security retirement income. Widows have more earnings than pre-widowhood, indicating they are returning to work. However, the increase in earnings is inadequate to make up for the loss in other primary income resources. In comparison, men's income declines by a smaller amount in the first two years, and shows no significant differences from their pre-widowhood levels after the initial drop.

Second, compared to pre-widowhood levels, both men and women experience declines in their family wealth in the first two years of widowhood, most likely caused by medical costs and funeral costs. After the initial reduction, however, widowed men have a stable level of wealth for an extended period, whereas widowed women continue to decumulate their wealth. By the 14th year in widowhood, women have lost accumulatively 23% of family wealth. Considering that widows suffer from a substantial fall in income, it's not surprising that they decumulate wealth as one way to supplement income.

Third, the factor analysis identifies two constructs underlying the responses to the eight emotional and mental health questions: affects (depression, loneliness, sadness, unhappiness, not enjoying life), and somatic symptoms (restless sleep, everything is an effort, and cannot get going). This line of division between the two factors is consistent with the psychology literature on the emotional quality of experience and the physical quality of emotional experience (Barrett, 1998; Posner et al., 2005).

While married, men tend to have a more positive emotional experience—less depressed and less fatigued—than women. The loss of a spouse is found to be a more stressful event to men, whose mental conditions deteriorate sharply in bereavement. Moreover, the negative effect is longer-lasting among men than among women. Women's affect score returns to their baseline level within four years, but men don't fully recover even after eight years.

This study points to a sad fact that losing a spouse is shattering for both genders with different challenges. For women, we need to reflect on effective policies that strengthen their financial security. For example, women need financial education that is user-friendly and digestible to help them navigate wealth management independently. People near retirement should carefully weigh the tradeoff between claiming Social Security benefits early versus late. Couples could seek expert advice on the optimal claiming strategy, based on their specific financial and health conditions. In terms of private retirement plans, couples need to have a clear evaluation of their wealth, health, and expected longevity to make sound choices over the survivor protection in their pension plans. As the private sectors in the US have gradually shifted away from defined-benefit plans to defined contribution plans, we also need to think about how to effectively protect spouses of workers with 401(k) type plans, which generally don't provide a guaranteed income stream for life.

Although men don't experience the same financial impact as women do from widowhood, they are emotionally vulnerable after losing their wives. Many studies have shown that married men exchange social support primarily with their spouses, whereas women do so with both their spouses and other social connections like friends and children (Antonucci and Akiyama, 1987). Widowed men lose not only their wives, but also their primary source of emotional support, including confiding, reassuring, and respect. Widowed men experience more drastic shifts in moods and a hike in the suicide rate, which by itself warrants care and attention. Family and friends need to pay more attention to widowers' mental health state and provide them with more social and emotional support.

Table 1
Summary Statistics for Data Sample.

	Intact Individuals		Eventually Widowed	
	Men	Women	Men	Women
Age	64	61	73	71
Age when widowed	–	–	77	73
Race and ethnicity				
White	73%	73%	78%	77%
Black	11%	11%	14%	13%
Hispanic	12%	12%	7%	8%
Others	4%	4%	1%	2%
Education				
No high school	13%	10%	23%	16%
High school	38%	42%	43%	52%
College	34%	37%	25%	26%
Graduate school	15%	11%	9%	6%
Self-reported health				
Excellent health	14%	15%	10%	10%
Very good health	33%	34%	27%	29%
Good health	33%	31%	32%	32%
Fair health	15%	15%	23%	21%
Poor health	5%	5%	8%	8%
Work history				
Worked < 15 yrs	7%	25%	5%	29%
worked 15–32 yrs	16%	38%	12%	32%
worked 32–44 yrs	42%	28%	35%	24%
worked ≥ 44 yrs	35%	9%	48%	15%
Have living children	96%	96%	95%	96%
Household size	2.68	2.68	2.17	2.08
More than self in the household	100%	100%	74%	69%
Own home	90%	90%	80%	81%
Household income (adjusted for family size), in 2014 \$				
Mean	\$58,287	\$58,117	\$38,728	\$35,492
Median	\$44,183	\$44,127	\$27,664	\$25,070
Household wealth, in 2014 \$				
Mean	\$502,495	\$500,258	\$390,562	\$361,645
Median	\$265,899	\$264,665	\$178,666	\$175,492
Emotional health index (# of issues out of 8)	0.96	1.28	1.48	1.72
Proportion reporting emotional wellbeing issues				
Depressed	8%	12%	15%	18%
Feel lonely	7%	10%	23%	23%
Feel sad	10%	18%	19%	25%
Feel unhappy	9%	11%	13%	14%
Not enjoy life	5%	7%	7%	9%
Restless sleep	24%	31%	27%	33%
Everything is an effort	19%	20%	23%	25%
Cannot get going	14%	18%	21%	24%
# Observations	46,387	45,369	11,369	33,093
# Distinct persons	8,463	8,287	1,402	3,744

Note: Data are from Health and Retirement Study, 1992–2016. We include all individuals (1) who remained married during the entire study period (“intact”), and (2) who were married and then widowed during the study period (“widowed”). We exclude individuals that were widowed in all survey periods as their pre-widowhood status cannot be observed. For “eventually widowed,” their records both before and after widowhood are included.

Data and summary statistics

Data for this study are from the Health and Retirement Study (HRS) between 1992 and 2016, a national longitudinal survey of individuals over age 50 and their spouses or partners regardless of age. The survey provides rich information on demographics, income, assets, physical and mental health, and family structure. All monetary variables are converted to 2014 real dollars using the Consumer Price Index (CPI-U-RS).

The final data sample includes two groups of individuals: (1) people that remained married for the entire study period, and (2) people who were married in at least one survey period, and then widowed subsequently. In other words, we exclude individuals who were widowed in all surveys, for whom we cannot observe changes from pre-widowhood

to post-widowhood. Widowed persons who remarried (about 3% of records) are also excluded. The final data sample is composed of 8,463 intact men (46,387 person-years), 8,287 intact women (45,369 person-years), 1,402 eventually widowed men (11,369 person-years), and 3,744 eventually widowed women (33,093 person-years). The summary statistics are presented in [Table 1](#).

Dependent variables

The dependent variables include income, wealth, and emotional and mental health wellbeing. Household income is adjusted for household size. The *equivalence-adjusted income* is obtained by dividing household income by the square root of the number of household residents ([Coulter et al., 1992](#); [Bureau, n.d.](#)). The use of the equivalence-adjusted income reflects the fact that people in the same household share resources and take advantage of economies of scale.

The HRS asks its survey participants eight questions regarding emotional and mental health. Specifically, the questions ask whether, in much of the time in the past week¹, a person (1) feels depressed, (2) feels everything is an effort, (3) has trouble sleeping, (4) is unhappy, (5) is lonely, (6) is not enjoying life, (7) is sad, and (8) cannot get going. A factor analysis is used to identify the underlying constructs for these eight items (see Section “Empirical strategy” for more detail).

Independent variables

The fixed-effect models include time-varying independent variables such as age, health, years that a person has spent on working, whether living with someone else, homeownership, dummies for widowhood duration, and year dummies. Compared to the eventually widowed individuals, intact people are slightly better educated, with better physical health, and have more income and wealth. Intact individuals report fewer emotional and mental challenges than widowed. For instance, widowed men are twice as likely to be depressed and sad than intact men, and more than three times as likely to feel lonely.

Focusing on the eventually widowed (columns 4 and 5 in [Table 1](#)), men and women are reasonably comparable in many dimensions, including race and ethnicity, age, age when widowed, widowhood durations, health conditions, homeownership, and family structure.

Normalizing the year when one’s spouse dies to zero, the financial and mental wellbeing of the widowed persons can be depicted as a function of the time relative to the onset of widowhood ([Fig. 1](#)). Compared to widowers, widows suffer from a more significant loss in both income (household size-adjusted) and family wealth, and a hike in the likelihood of falling into poverty. In terms of emotional and mental challenges, both genders show a considerable increase in emotional and mental health problems. For example, the rates of depression, loneliness, and sadness peak at 26%, 58%, and 42%, respectively, when one’s spouse dies. It’s worth noting that while still married, women were more likely to experience mental health problems than men. In widowhood, however, men report more issues such as depression and loneliness than women.

¹ In all except Wave 1, the question has a “yes” or “no” response to whether the respondent felt a certain way “much of the time.” For Wave 1, the answer could be one of the four categories: “all or almost all of the time,” “most of the time,” “some of the time,” or “none or almost none of the time.” According to the HRS documentation, “much of the time” in later waves is somewhere between “some” and “most” of the time in Wave 1. Because of this unclear correspondence between responses in Wave 1 and all later waves, data from Wave 1 are dropped when analyzing the emotional wellbeing of the widowed men and women.

Empirical strategy

Panel fixed-effects models

A panel fixed-effects model is adopted to estimate the impact of widowhood on older individuals’ financial and emotional conditions. The formulation is very similar to the framework specified in [Bayaz-Ozturk, et al. \(2018\)](#):

$$y_{it} = \alpha + \beta X_{it} + \sum_{k=1}^{13} \gamma_k d_{it}^k + \delta T_{it} + \mu_i + \varepsilon_{it} \quad (1)$$

where y_{it} can be a measure for individual i in calendar year t , on either economic resources or mental-emotional conditions. Economic measures include household size-adjusted family income and family net wealth. Two measures are used to quantify emotional and mental conditions: affects (e.g., depression, loneliness, sadness, unhappiness, not enjoying life) and somatic symptoms (e.g., restless sleep, cannot get going, everything is an effort). See Section “Factor analysis for emotional and mental wellbeing” for obtaining affects and somatic symptoms.

On the right-hand-side of Eq. (1), X_{it} represents a set of time-varying demographic characteristics, including age, age-squared, years of education, employment history, self-reported physical health conditions, household composition, and so forth. T_{it} represents a set of categorical variables that control for the survey years. The parameter μ_i represents the individual time-invariant fixed-effects. ε_{it} is an error term that is independent and identically distributed.

A series of dummy variables, $\{d_{it}^k\}$, are used to indicate a person’s timing position relative to the year of spousal loss. For example, $d_{it}^1 = 1$ if time t is more than seven years before widowhood. $d_{it}^2 = 1$ if the time is between 5 ~ 6 years before widowhood. $d_{it}^3 = 1$ if the time is between 3 ~ 4 years before widowhood. $d_{it}^4 = 1$ if the time is between 1 ~ 2 years before widowhood. $d_{it}^5 = 1$ represents the exact year of a spouse’s death. $d_{it}^6 = 1$ for the first two years in widowhood, ..., $d_{it}^{12} = 1$ if the time is between 13 and 14 years in widowhood, and lastly, $d_{it}^{13} = 1$ if it’s after the 15th year in widowhood. The baseline is the fourth dummy, d_{it}^4 , which is the two-year bin right before widowhood².

The final sample includes individuals who lost their spouse during the survey period of 1992–2016, as well as those who stayed married. For people with intact marriage, their values for the dummies $\{d_{it}^k\}$, will be time-invariant. The advantage of including the intact individuals instead of only focusing on the widowed is that even if individuals don’t become widowed, they may experience changes in wellbeing. For example, both intact and widowed individuals lived through the expansionary years of the 1990s as well as the recessionary years in the late 2000s. Excluding the intact individuals can result in an overestimate of the loss due to widowhood during economic downturns and an underestimate in a booming economy ([Bayaz-Ozturk et al., 2018](#); [Tach and Eads, 2015](#)).

Factor analysis for emotional and mental wellbeing

The HRS includes the Center for Epidemiologic Studies-Depression (CES-D) measures for mental health conditions. The survey question is “In the previous week, did you experience the following feeling much of the time?” The eight items are depressed, lonely, sad, unhappy, not enjoying life, restless sleep, everything is an effort, and cannot get going. Since developed in the 1970s, the CES-D scale has been shown to be a reliable measure for assessing the number, type, and duration of

² In practice, one can select any of the 13 dummy variables as the baseline. The interpretation is more intuitive, in our opinions, to use the years right before the event (i.e., the onset of widowhood) as the baseline, so that regression estimates can be interpreted as how things have changed following the occurrence of the event.

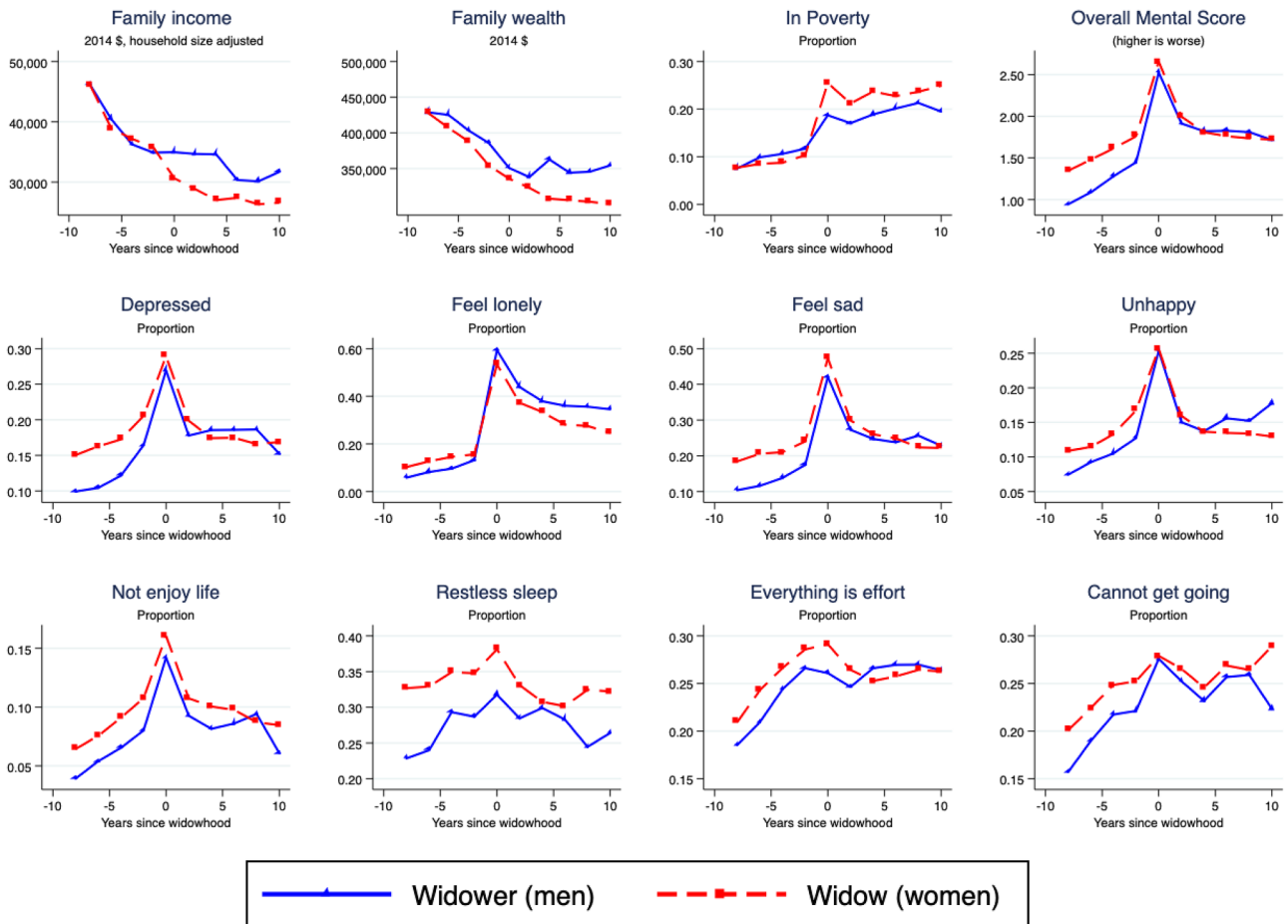


Fig. 1. Financial and Mental Wellbeing before and after Widowhood. Note: Data are from Health and Retirement Study, 1992–2016. The year when one’s spouse died is normalized as 0 and plot financial and mental wellbeing of men and women in pre-widowhood and post-widowhood years. The overall mental health score (upper right corner) is the CESD score, which is the unweighted sum of the eight individual emotional and mental issues (depressed, feel lonely, sad, unhappy, not enjoy life, bad sleep, everything an effort, cannot get going).

depressive symptoms across socioeconomic and demographic categories (Lawton et al., 1989; Payne et al., 2014; Ritchey et al., 1990).

These eight feeling items can be grouped based on their interrelationships. For instance, the feeling of depression tends to be more correlated with loneliness, whereas everything an effort is more correlated with cannot get going. In this paper, a factor analysis is adopted to model such interrelationships and uncover the underlying constructs (also called “factors” or “components”). More specifically, the goal is to find q factors that linearly reconstruct the eight original survey items:

$$h_{ij} = z_{i1}b_{1j} + z_{i2}b_{2j} + \dots + z_{iq}b_{qj} + e_{ij} \tag{2}$$

where h_{ij} is the observed response of the i^{th} person to the j^{th} survey question ($1 \leq j \leq 8$), z_{ik} is the i^{th} observation on the k^{th} factor, b_{kj} is the set of factor loadings, and e_{ij} is similar to a residual.

The first step of factor analysis is factor extraction, which aims at finding the minimum number of factors to explain the maximum amount of variance in each of the survey items. Two standards are used here: first, the rule of thumb in picking the number of factors is to include factors whose eigenvalue is greater than 1. By this rule, factor 1 (eigenvalue = 3.41) and factor 2 (eigenvalue = 1.01) are chosen. Secondly, we need to apply domain knowledge to ensure that the factor selection makes sense. Research in psychology (Barrett, 1998; Lazarus, 1984; Posner et al., 2005; Zajonc, 1984) has shown the distinctions between the emotional quality of experience that is more subjective and apart from physical changes (“affects”), and the physical quality and bodily revelation of emotional experience (“somatic symptoms”). The

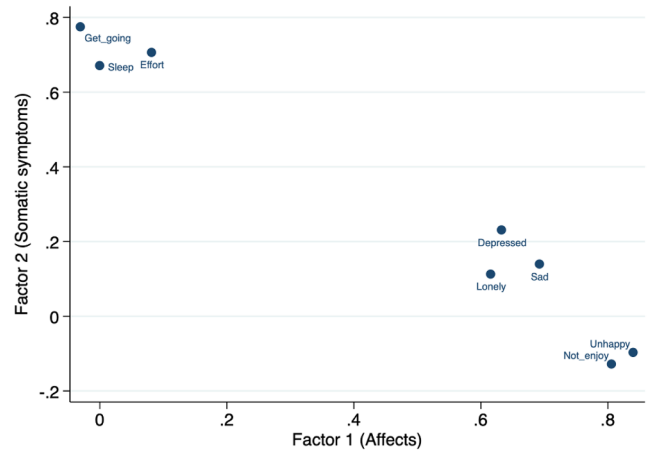


Fig. 2. Factor Loadings - Factor Analysis of Eight Mental Health Issues. Note: Data are from Health and Retirement Study, 1992–2016. The square of each loading represents the proportion of variance in a variable explained by a particular factor. For example, the variable “depressed” has a loading 0.6340 on factor 1, meaning $(0.6340)^2 = 40\%$ of the variance in “depressed” can be explained by factor 1. The factor loadings above show that factor 1 explains more variances in depressed, lonely, sad, unhappy, and not enjoying life, whereas factor 2 explains more variances in cannot get going, restless sleep, and everything an effort.

factor analysis loadings (Fig. 2) suggest that factor 1 primarily explains³ the variances in depression, loneliness, sadness, unhappiness, and not enjoying life, and factor 2 explains the variances in restless sleep, everything an effort, and cannot get going. Thus, the results of the factor analysis are consistent with the psychology literature. The two factors are allowed to be correlated⁴ in the factor rotation (Thurstone, 1935). For more technical notes on factor analysis, see DiStefano et al. (2009), and resources by UCLA (A Practical Introduction to Factor Analysis: Exploratory Factor Analysis, n.d).

Results

How widowhood impacts individuals' financial wellbeing

Table 2 and Fig. 3 present the fixed-effect estimates of the impact of widowhood on financial wellbeing. The two-year bin right before the death of a spouse is used as the baseline.⁵

Fixed-effect model estimates

In considering the pattern of estimates for men and women in the period from 1992 to 2016, the focus is on the coefficients for widowhood duration dummies. Compared to the two years before widowhood ("baseline"), widows' family size-adjusted income declines by \$7,918 in the year of widowhood, a nearly 22 percent drop. After the initial shock, widows continue to have less income, and after eight years, their income is still significantly below their pre-widowhood level. In contrast, widowers' income levels show almost no significant differences from their baseline values, except for a small drop in the first two years of widowhood.

A substantial loss in family wealth is also found among widows. Compared to the baseline, widows' family wealth decreases by over \$35,000 after losing their husbands (10 percent drop). Subsequently, widows continue to decumulate their wealth. By the end of the 14th year, widows' family wealth is over \$80,000 below their pre-widowhood level. In comparison, men's wealth only declines in the first two years after the death of their spouse, after which, it shows no significant differences from their pre-widowhood level.

Among other time-varying covariates, work history and health are strong predictors for financial security. Compared to those who had worked for less than 15 years, men and women who have worked for 32–44 years have about \$11,000 and \$6,000 more in income, respectively. This is primarily because both Social Security and pension benefits are tied to the length of work and contributions.

Decomposing sources of income losses

Having seen that widows experience a significant income loss after losing their spouse, the next question is, on which income components do widows suffer the most declines? For older families, the most important income sources are earnings, pension income, Social Security retirement income, and capital income. Table 3 shows a breakdown of the income loss. All income values are adjusted for the household size. Columns (2) and (4) show the averages within the two years before widowhood. Columns (3) and (5) record the changes within the first two years after widowhood. In total income, widowed men have a small, weakly significant decline, whereas widowed women face a significant income loss. After losing spouse, widows receive more from earnings (37%), but less from pension income (–35%), the Social

Security retirement income (–49%), the Social Security disability income (–72%), and other government welfare transfers (–64%).

It's worth noting that both genders have more earnings and less Social Security retirement income in widowhood compared to their baseline levels. However, pension income declines substantially for widowed women but remains steady for widowed men. This is mainly because men are more likely than women to be the policyholder of a pension plan. Whether or not the pension payout continues after the death of a policyholder depends on a couple's choice between a "Single Life Benefit" and a "Joint and Survivor benefit."⁶ If choosing the latter, they also need to decide on what percentage of benefits the surviving spouse will receive. Many couples today leave it at the default of 50 percent. Federal law requires the pension policyholder to obtain the written consent of their spouses if they choose a single life benefit. Additional public efforts to push for survivor protection may generate only a small marginal effect, as most men who decline survivor protection appear to have legitimate reasons for their decisions, such as they are under more financial strain, they expect to outlive their spouse, their spouse has own retirement plans, or they have weak marital bond with spouse (Johnson et al., 2003).

How widowhood impacts individuals' emotional and mental wellbeing

This section examines how widowhood impacts one's emotional and mental wellbeing. As discussed in Section "Factor analysis for emotional and mental wellbeing", affects and somatic symptoms are identified as the underlying factors for the eight mental health questions. The factor *affects* represent depression, loneliness, sadness, unhappiness, and not enjoying life. More related to bodily changes, the factor *somatic symptoms* constitute restless sleep, everything an effort, and cannot get going.

As shown in Table 2 and Fig. 4, compared to the baseline (two-year prior), both genders experience worsening emotions (higher value is worse) after losing a spouse. Still, men suffer from a greater significant impact. In the year of widowhood, men's affects score increases by 0.74, whereas women's affects score increases by 0.60. To put things in perspective, the standard deviation of affects is 1.02 for men and 1.18 for women before widowhood. That means men's change in affects accounts for 73 percent of a standard deviation, whereas women's change in affects accounts for 50 percent of a standard deviation. Moreover, the impact is longer-lasting for widowers. After eight years, men's affect score is still worse than their pre-widowhood level, whereas women's affects generally recover within four years.

An important question often raised in the domain of life events and experiences is whether people adapt to external shocks. In psychology, the adaptation theory was first proposed in the 1970s ("Hedonic Treadmill Theory") and has evolved over time. Despite some differences, most psychologists today agree that, in general, people adapt to circumstances and their emotional reactions rebound after major life events, including positive ones such as winning a lottery and negative ones such as suffering from a crippling accident (Brickman et al., 1978; Brickman and Campbell, 1971; Diener et al., 2006; Bonanno et al., 2002). On average, people appear to adapt; however, there exist substantial between-person variations in the rate and extent of adaptation (Lucas et al., 2003). The findings in the present study are consistent with these theories on adaptation. Emotional recovery is observed in both widowed men and women after some years. Women appear to recover more quickly than men, in both affects and somatic symptoms. Moreover, among widowed individuals who reacted strongly to their spouse's death, their affect score remained significantly worse than their baseline level after many years. In contrast, among the widowed

³ The square of each loading represents the proportion of variance explained by a particular factor. For example, the loading 0.6340 means that $(0.6340)^2 = 40\%$ of variance in the variable "depressed" is explained by factor 1. The variable "restless sleep" has a loading of 0.6676 on factor 2, meaning $(0.6676)^2 = 45\%$ of its variance is explained by factor 2.

⁴ Technically, use *oblique oblimin rotation*. See Stata manual on rotate.

⁵ Two-year bins are used because the Health and Retirement Study (HRS) is conducted every two years.

⁶ A single-life annuity generates a higher monthly payment than a joint and survivor annuity when the policyholder is alive, and a joint and survivor annuity provides more financial protection to the spouse if the policyholder dies.

Table 2
Fixed-Effect Estimates of the Impact of Widowhood on Financial, Emotional, and Mental Wellbeing.

	Income		Wealth		Affect		Somatic symptoms	
	Men	Women	Men	Women	Men	Women	Men	Women
<i>Baseline values (within 2-yr before widowhood)</i>								
Mean	34,897	35,828	385,733	354,021	0.06	0.22	0.09	0.21
S.D.	(32,416)	(33,186)	(605,564)	(518,256)	(1.02)	(1.18)	(1.03)	(1.10)
<i>Fixed-Effect Model Estimates</i>								
<i>Time relative to widowhood onset</i>								
≤ -7 yrs	-1,712	-823	24,140	73,529***	-0.13***	-0.18***	-0.05	-0.03
[-6, -5]	355	-1,224	4,565	34,884***	-0.13***	-0.14***	-0.07*	-0.04
[-4, -3]	-726	-790	7,080	22,822**	-0.09**	-0.11***	0.01	0.00
[-2, -1] (baseline)								
0 (Widowhood onset)	-4,207*	-7,918***	-30,028	-22,455*	0.74***	0.60***	0.17***	0.12***
[1, 2]	-3,704*	-8,057***	-54,426**	-35,401***	0.30***	0.16***	0.10*	0.00
[3, 4]	-2,257	-8,093***	-44,897*	-61,200***	0.18***	0.06*	0.08	-0.07*
[5, 6]	-3,770	-5,392***	-35,890	-56,516***	0.15**	-0.01	0.11*	-0.06*
[7, 8]	-980	-4,157***	-23,074	-63,267***	0.13*	-0.03	0.05	-0.03
[9, 10]	2,158	-2,300	-21,615	-54,304***	0.06	-0.06	-0.02	-0.03
[11, 12]	5,831	-1,010	-55,450	-76,234***	0.08	-0.02	0.01	-0.11**
[13, 14]	5,245	-719	-22,035	-80,379***	-0.07	-0.12**	0.08	-0.03
≥ 15 yrs	-562	102	-80,036	-106,766***	-0.03	-0.11*	0.04	-0.03
<i>Other time-varying demographic variables</i>								
Age	-444	-648***	44,430***	33,063***	-0.05***	-0.04***	-0.05***	-0.04***
Age squared	-2.54	-1.30	-276***	-201***	0.00***	0.00***	0.00***	0.00***
<i>Self-reported health, baseline: Excellent</i>								
Very good	1.76	-1,141*	8,537	14,937**	0.01	0.05***	0.04**	0.05***
Good	-799	-1,706***	596	8,272	0.06***	0.13***	0.12***	0.18***
Fair	-1,650*	-1,876**	-13,554	-8,648	0.21***	0.34***	0.34***	0.44***
Poor	-1,822	-2,384**	-26,577*	-9,008	0.60***	0.74***	0.72***	0.82***
<i>Work history, baseline: worked less than 15 years</i>								
worked 15-32 yrs	2,464	5,356***	-21,687	10,211	-0.08	0.02	0.01	0.05
worked 32-44 yrs	11,436***	6,720***	51,820*	44,250***	0.00	0.04	0.00	0.06
worked ≥ 44 yrs	12,456***	6,200***	77,209**	51,655**	-0.01	0.05	-0.02	0.02
Have at least one living child	-3,352	-930	-60,667**	20,536	0.04	-0.07	0.01	-0.06
Live with someone else	-10,649***	-7,265***	-688	-164	-0.06*	-0.02	0.03	0.00
Own home	2,195**	701	134,418***	130,015***	0.01	-0.01	0.04*	0.04**
Family income (log)					-0.01***	-0.02***	-0.01**	-0.01*
Observations	57,325	78,007	57,325	78,007	48,540	70,280	48,540	70,280

Note: Data are from 1992 to 2016 HRS. * for p < 0.05, ** for p < 0.01, and *** for p < 0.001. Results for year dummies and constant are omitted in the table to save space. The regressions include (1) individuals who were married during the entire study period, and (2) individuals who were once married and later widowed during the study period. For "Affect" and "Somatic symptoms", higher values correspond to worse conditions.

with a relatively mild initial reaction, their affect scores returned to their baseline sooner.

The considerable variability in the adaptation and recovery process suggests that people may not inevitably return to a predetermined level of happiness and wellbeing. Instead, their adaptation can be influenced by genetics, personalities, attitudes, and coping strategies. Research has demonstrated the power of specific interventions on alleviating stress, including increasing the thoughts of gratitude, having dispositional optimism, seeking social support, engaging in the positive reappraisal of adverse events (Aspinwall and Taylor, 1992, 1997; Chang, 1998; Diener et al., 2006; Gross and John, 2003; Scheier, 1989; Scheier et al., 1986).

Sensitivity analysis

This section includes three sensitivity analyses. The first analysis considers whether being the primary income earner will help mitigate the financial impact of widowhood. The second analysis examines the potential biases in the estimation due to the correlation between longevity and economic wellbeing. The last one looks into how child proximity may change the impact of widowhood on emotional wellbeing.

Since the data contain no information on who the primary income earner is, a woman is deemed the breadwinner if she receives more income than her husband in over 50 percent of the time, during their entire marriage. Approximately 20% of households have a female breadwinner. As shown in Table 4, widowed men face a more

significant income loss if their deceased wives were the breadwinner. For widowed women, none of the interaction terms are significant. In other words, whether a woman is a breadwinner or not, she experiences a similar income loss from pre-widowhood. The lack of an accurate indicator of primary income earner might have contributed to this somewhat surprising result. Besides, the percentage of female breadwinners (even by our very loose definition) is relatively low, which prohibits us from understanding the implications of being the primary income earner.

The second sensitivity analysis is motivated by the notion that wealth correlates with health and longevity. Thus, the results on later-stage wellbeing can be biased as the wealthier widows and widowers live longer. Table 5 shows whether individuals widowed at a younger age are impacted more financially. While few significant differences are found for men, the age when one became widowed makes a substantial difference for women: those widowed before age 75 ("younger widows") face a more significant and enduring financial impact than those widowed after age 75 ("older widows").

The third sensitivity analysis examines whether the proximity of children⁷ are associated with emotional and mental health for the widowed. The focus is on the interaction term between widowhood and the number of children living within ten miles of the respondent.

⁷ The HRS Child Proximity Measures are available only for 2004, 2006, and 2008 waves (HRS Cross-Wave: Child Proximity, v.1.0). Thus, this sensitivity analysis only makes use of these three waves of the HRS data.

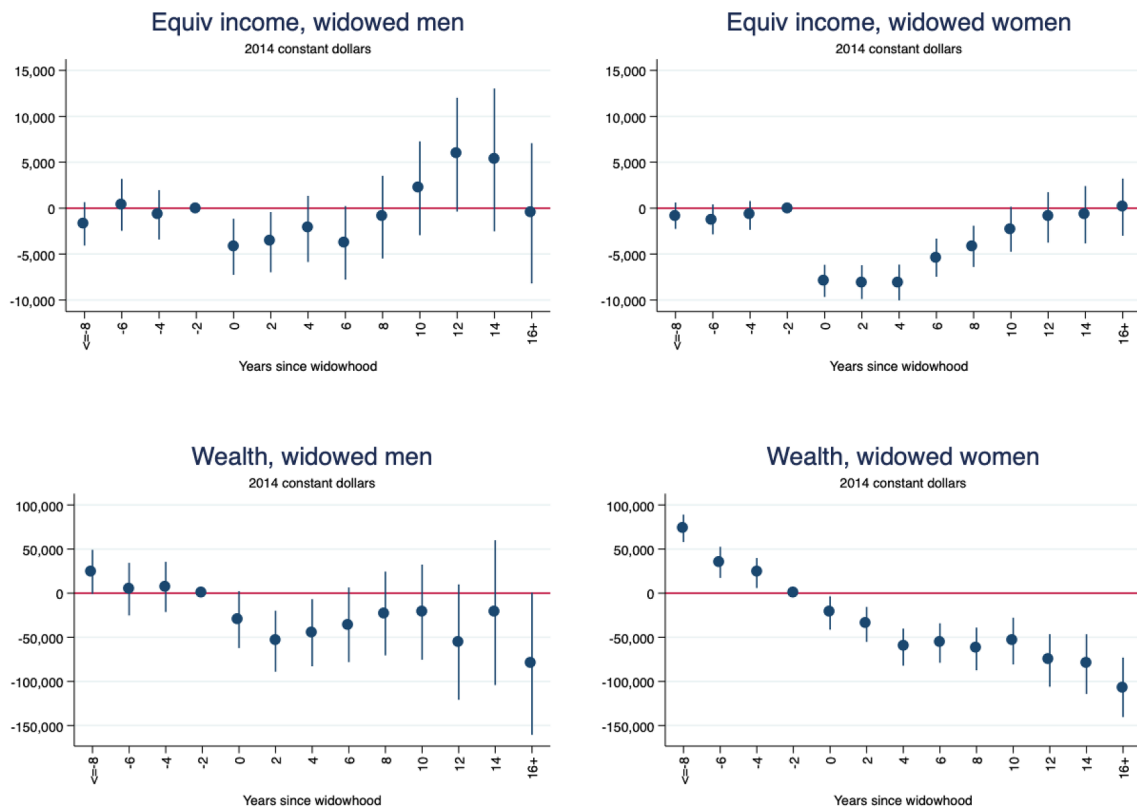


Fig. 3. Changes in Financial Security (Equivalence Income and Family Wealth) Before and After Widowhood. Fixed-effect Regression Coefficient Estimates and 95% Confidence Intervals. Note: Data are from 1992 to 2016 HRS data. X-axis represents the number of years before and after the death of spouse. The baseline is (-2), meaning two years prior to the spousal loss. Y-axis is in the unit of 2014 constant dollars. The solid dots represent fixed-effect regression coefficients estimates, and the vertical lines represent 95% confidence intervals. The results suggest that widowed women face a significant decrease in income after their spouses died. Moreover, widowed women’s wealth continues to decline in widowhood.

Table 3
Breakdown of Income Changes for Widowed Individuals.

Income Breakdown	Widowed Men		Widowed Women	
	2-yr before	Change from 2-yr before	2-yr before	Change from 2-yr before
(all adjusted for family size)				
Total income	34,897	- 3,705*	35,829	- 8,058***
Earnings	5,818	2,511*	6,898	2,489***
Pension income	6,494	- 714	6,992	- 2,418***
Social Security Retirement income	12,498	- 5,449***	12,117	- 5,899***
Capital income	7,358	798	6,692	- 646
Social Security disability	682	- 401***	673	- 486***
Unemployment, worker compensation	118	- 76	139	- 72
Other govt transfers	998	105	1,068	- 687***
Other income	930	- 259	1,250	- 341

Note: Data are from 1992 to 2016 HRS. * for $p < 0.05$, ** for $p < 0.01$, and *** for $p < 0.001$. All incomes are adjusted for household size. Columns (2) and (4) are average dollar amounts in the two-year bin before widowhood. Columns (3) and (5) are Panel Fixed-Effect model estimates of the changes in the two-year bin after widowhood. Results show that for both genders, the reduction in the Social Security retirement income is large and significant. For widowed women, they also face a reduced pension income and government transfers (e.g., veterans’ benefits, welfare, and food stamps).

Results in Table 6 show that after losing their spouses, having children in proximity helps improve widowed men's affects, somatic symptoms, as well as overall mental health scores (lower values indicate better mental conditions). The results are not significant for widowed women.

Discussion and implications

This paper addresses the question of whether differences in financial, emotional, and mental wellbeing after bereavement vary systematically with the gender of the surviving spouse, using data from the Health and Retirement Study between 1992 and 2016. Financial

wellbeing is measured by household size-adjusted income and family wealth. Mental and emotional wellbeing is measured by affects (e.g., depression, sadness, loneliness, and unhappiness) and somatic symptoms (e.g., restless sleep, cannot get going).

The main estimation framework includes a panel fixed-effect regression model with dummy variables representing the time relative to the year of spousal loss. Ceteris paribus, compared to the two years right before widowhood (“baseline”), widows suffer from a substantial income loss by approximately 22%, as well as a 10% decline in family wealth in the short-term. In the mid-term and long-term, widows’ income remains well below their baseline level, and their wealth

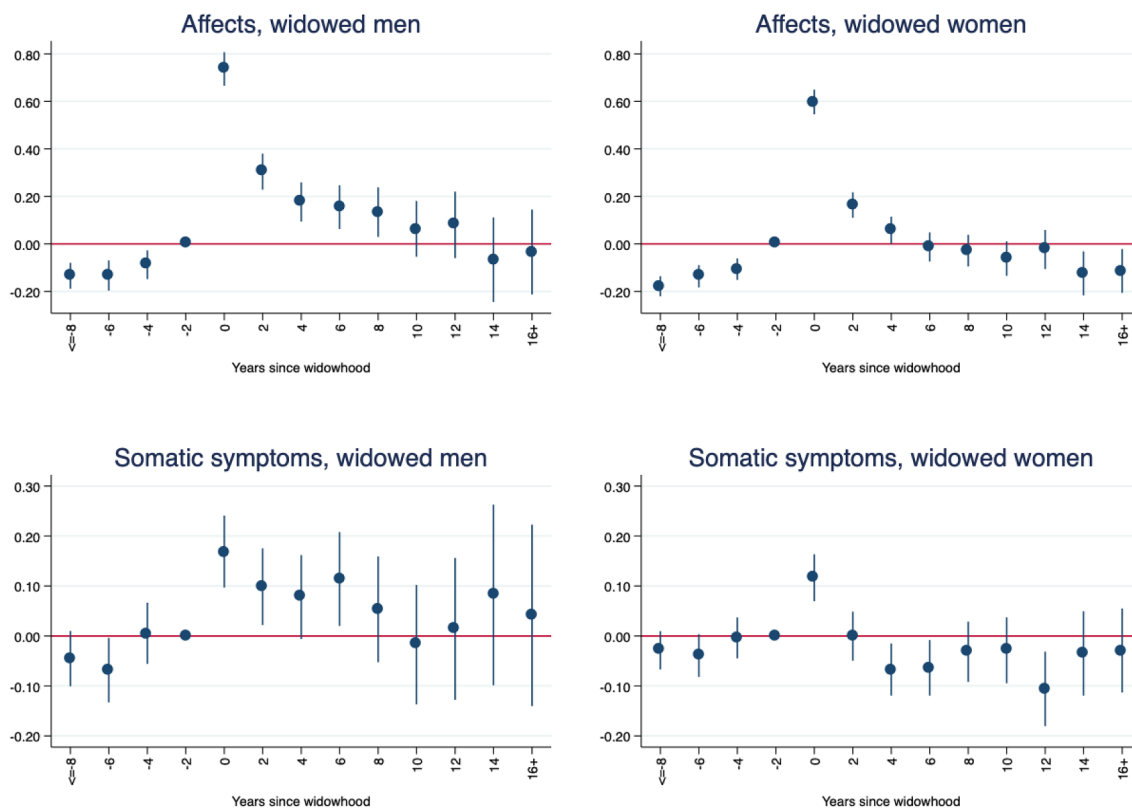


Fig. 4. Changes in Mental health (Affects and Somatic Symptoms) Before and After Widowhood. Fixed-effect Regression Coefficient Estimates and 95% Confidence Intervals. (Higher value corresponds to worse mental health conditions). Note: Data are from 1992 to 2016 HRS data. X-axis represents the number of years before and after the death of spouse. The baseline is (-2), meaning two years prior to the spousal loss. Y-axis represents the changes in mental health. The solid dots represent fixed-effect regression coefficients estimates, and the vertical lines represent 95% confidence intervals. The results suggest that widowed men’s affects worsen more than widowed women after their spouses died. Moreover, widowed men’s mental health conditions remain worse than their baseline level for at least eight years.

continues to decrease. In comparison, widowers don’t experience similar deterioration in their financial resources.

While widowed men enjoy more financial stability than widowed women, they suffer more emotionally. Compared to their pre-widowhood level, both genders experience worsening mental health conditions, but the changes are more drastic and enduring for men. While women’s affect scores on average return to their baseline levels within four years, men’s affect scores don’t fully recover even after eight years.

In the following, we discuss policy implications and potential interventions for helping improve the financial and emotional wellbeing for widowed persons.

Discussions with a focus on improving financial security

Optimizing the social security claiming strategy

Social Security benefits are tied to the claiming age. Take the cohort born between 1943 and 1954 for example: claiming at 62, one gets roughly 75% of the full benefits; Claiming at 66 (i.e., the “full retirement age”), one gets 100%; Deferring claiming to age 70, one gets about 132% (SSA a; SSA b). Thus, if both spouses have contributed to Social Security, their optimal claiming strategy is for the spouse who has higher lifetime earnings to defer claiming Social Security benefits. For those widowed at a relatively early age, they face different claiming incentives. They could claim their own benefits while allowing their deceased spouse’s benefits to grow through the delay (up to full retirement age). Alternatively, they can claim the survivor benefits on their spouse’s Social Security as early as age 60, while allowing their own benefits to grow through the delay. A full discussion of the Social Security claiming strategy is beyond the scope of this paper, but has been studied extensively in the literature (Fellowes et al., 2019; Sass

et al., 2013; Shoven and Slavov, 2012; Shoven et al., 2017; Stuart et al., 2010).

Private retirement plans

Social Security is facing many financial challenges of its own, which has raised the importance of private retirement plans. As discussed in Section “How widowhood impacts individuals’ financial wellbeing”, couples with defined-benefit (DB) pension plans must evaluate their family wealth, health, and longevity risks to make joint decisions on the survivor protection.

As private sectors in the US has gradually shifted away from traditional defined-benefit (DB) plans toward defined-contribution (DC) plans like 401(k)’s, more attention is now paid to how to protect spouses of workers in DC plans. Many employers sponsoring DC plans were hesitant about offering the annuity options, due to potential legal risks if their chosen insurance companies failed to make annuity payments to their retired employees in the future (Sammer, 2018). As of 2019, only 10% of employers reported offering any qualified longevity annuity contracts or longevity insurance in their DC plans remained low (Callan, 2020). Without annuities, older people need to carefully manage their rate of spending to avoid depleting their assets (VanDerhei and Copeland, 2001), which is particularly important for women with limited funds and expect to outlive their husbands by many years. The Setting Every Community Up for Retirement Enhancement Act of 2019 (the SECURE Act) makes it easier for employers to offer annuities via 401(k)’s (Neal, 2019). It’s too soon to tell whether employers will respond to the new legislation by adding annuity options in their retirement plans. Also, it’s unclear whether people will choose to the annuity option even when available, absent a mandate or default. To help widows, an anti-poverty deferred annuity (also known

Table 4
Sensitivity Analysis (a) - Female Breadwinner (Fixed-Effect Model).

	Men	Men (incl. breadwinner info)	Women	Women (incl. breadwinner info)
<i>Years before and after widowhood, baseline: two-year prior to widowhood</i>				
≤ -7 yrs	-1,712	-1,547	-824	-1,040
[-6, -5]	355	446	-1,224	-1,613
[-4, -3]	-727	-1,215	-790	-519
0	-4,207**	-3,417*	-7,918***	-8,318***
[1, 2]	-3,705*	-2,576	-8,058***	-7,866***
[3, 4]	-2,257	-1,886	-8,094***	-7,871***
[5, 6]	-3,771	-2,826	-5,392***	-5,124***
[7, 8]	-980	-155	-4,157***	-3,610**
[9, 10]	2,159	3,398	-2,300	-1,978
[11, 12]	5,832	6,682*	-1,010	-281
[13, 14]	5,246	6,089	-720	-104
≥ 15 yrs	-562	523	103	475
Female breadwinner		0		0
<i>Female breadwinner (FB) interacting with time dummies</i>				
FB × ≤ -7 yrs		-1,403		879
FB × [-6,-5]		-623		1,805
FB × [-4,-3]		3,821		-1,410
FB × 0		-6,256		1,851
FB × [1,2]		-8,581*		-1,221
FB × [3,4]		-2,720		-896
FB × [5,6]		-7,795		-1,192
FB × [7,8]		-6,958		-2,324
FB × [9,10]		-11,439		-1,435
FB × [11,12]		-6,555		-3,022
FB × [13,14]		-7,041		-2,411
FB × ≥ 15 yrs		-8,047		-1,382
Observations	57,325	57,295	78,007	77,869

Note: Data are from 1992 to 2016 HRS. * for p < 0.05, ** for p < 0.01, and *** for p < 0.001. Income is adjusted for household size. Female breadwinner is defined as while married, a woman has more income than a man in over 50% of the time. Results for other regressors are omitted. Whether a woman is a breadwinner is a time-invariant variable (which is why the estimate of “female breadwinner” is zero). The results above show that, for a widowed man, if his deceased wife was the main income earner, then he would suffer from a great income loss at the onset of widowhood. For widowed women, the interaction terms are insignificant.

as “longevity insurance”) that starts paying out at very old age, say 85, might be helpful and cheap.

Management of financial wealth

Women are shown to have less knowledge, confidence, and

Table 5
Sensitivity Analysis (b) – Early vs. Late Widowhood (Fixed-Effect Model).

	Men		Women	
	Widowed < 75	Widowed ≥ 75	Widowed < 75	Widowed ≥ 75
<i>Household size-adjusted income</i>				
0 (Widowhood onset)	-5,143*	-3,710	-9,304***	-5,908***
[1, 2]	-6,787**	-1,485	-9,530***	-4,822**
[3, 4]	-4,231	-418	-8,666***	-4,599**
[5, 6]	-5,406	-1,895	-6,149***	-283
[7, 8]	-1,180	-367	-4,352**	1,455
<i>Family wealth</i>				
0 (Widowhood onset)	-41,742	-31,865	-14,447	-25,140
[1, 2]	-72,339**	-46,768*	-44,490***	-14,646
[3, 4]	-59,096*	-35,677	-60,475***	-47,621**
[5, 6]	-51,376	-21,682	-70,159***	-14,904
[7, 8]	-65,892*	30,572	-84,039***	-52
[9, 10]	-42,885	15,329	-64,059***	-762

Note: Data are from 1992 to 2016 HRS. * for p < 0.05, ** for p < 0.01, and *** for p < 0.001. Income is adjusted for household size. Results for other regressors, including demographic variables, year dummies, and some widowhood duration dummies are omitted to save space. The results above show that women who widowed before 75 (“younger widows”) face a more significant financial impact than those widowed after age 75 (“older widows”). This can be possibly attributed to the positive correlation between health/longevity and financial status.

experience in financial planning and decision making (Lusardi and Mitchell, 2008; Stanford Center on Longevity, 2018). When their spouses pass away, women often find it difficult and confusing to handle financial investment that they had partly or entirely deferred to their husbands (Merrill Lynch, n.d; WISER, n.d). Women’s lack of experience in financial planning and lower levels of financial knowledge may have contributed to the widening economic gap between widows and widowers in the long-term shown in this paper. There are some bright spots, though. One recent study shows that women acquire financial knowledge in response to the incentives created by the prospect of widowhood, and most women are on track to catch up with their husbands before the expected onset of widowhood (Hsu, 2016). While it’s reassuring to see that women eventually catch up on financial literacy, results from the present paper show that “catching up” alone might not guarantee women’s economic security in widowhood. The reasons are complicated. Many crucial decisions such as survivor benefit elections and the Social Security claiming/delaying are generally made long before the onset of widowhood, but they carry long-term implications for the surviving spouses’ wellbeing. Women’s improved financial literacy around the time of widowhood cannot reverse prior decisions. Moreover, it’s unclear whether scoring high on financial literacy tests can translate smoothly to robust wealth management, as well as fraud prevention. More research is needed in this direction in the future.

Discussions with a focus on improving the mental and emotional wellbeing

Though widowhood is a stressful event for both genders, it has an adverse effect that’s more abrupt and enduring for men than for women. Immediately after the death of a spouse, men experience a surge in negative feelings such as depression and loneliness. Widowed men have a suicide rate more than four times that of widowed women in the first week, and men continue to have a higher mortality rate than women during the first year after bereavement (Ajdacic-Gross et al., 2008). Several factors have contributed to the stronger impact of widowhood for men. First, married men have a better emotional and mental health state than married women. Before widowhood, men are less likely to report depression and loneliness as well as fatigue and insomnia than women. Second, men and women generally exhibit different styles of social engagement and social connections. The literature on social support shows vast differences between men and women in their forming and maintaining social relationships, and giving and receiving social support. Such differences bear deep implications for the emotional recovery of widowed men and women. Compared to men,

Table 6
Sensitivity Analysis (c) - Child proximity and Emotional Wellbeing (Fixed-Effect Model).

	Affect		Somatic Symptoms		CESD Scores	
	Men	Women	Men	Women	Men	Women
In widowhood	0.99***	0.35***	0.20	0	1.40***	0.43**
Number of children nearby	0.14	-0.07	0.39**	-0.01	0.56*	-0.10
In widowhood × Children nearby	-0.51**	0.05	-0.43*	-0.04	-1.07***	0.02
Observations	2,011	11,768	2,011	11,768	2,011	11,768

Note: Data are from 2004, 2006, 2008 HRS (Child proximity data are only available for these three waves). * for $p < 0.05$, ** for $p < 0.01$, and *** for $p < 0.001$. “Number of children nearby” equals to the number of children (incl. step children) living within 10 miles. “In widowhood” is a dummy variable for time after the death of spouse. For affects, somatic symptom, and CESD scores, higher values indicate worse emotional and mental wellbeing. The coefficients of the interaction term are negative for men, indicating having children nearby helps improve the emotional conditions of widowed fathers.

women generally draw social support from more diverse sources, including friends, relatives, and children (Antonucci, 2001; Antonucci and Akiyama, 1987; Belle, 1991; Chappell, 1989; Gurung et al., 2003). Women are also found to be more likely than men to form new friendships and other social contacts after losing a spouse (Lamme et al., 1996). In contrast, men receive emotional support, including confiding, reassuring, and respect, primarily from their spouses. In times of need, such as in mourning, women are able to garnish more emotional support than men. As the present study has shown, bereavement is extremely devastating for men, who have lost their primary source of the emotional anchor. During this challenging time, children can help their widowed fathers make up for the loss in their social network and deal with their emotional turbulence and stress. Recognizing the sudden hike in negative emotions such as depression and loneliness among widowed men, family members, friends, and caregivers need to pay close attention to them and provide strong support for their emotional and mental wellbeing.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

References

A Practical Introduction to Factor Analysis: Exploratory Factor Analysis. (n.d.). Retrieved December 12, 2019, from: <https://stats.idre.ucla.edu/spss/seminars/introduction-to-factor-analysis/a-practical-introduction-to-factor-analysis/>.

Ajdacic-Gross, V., Ring, M., Gadola, E., Lauber, C., Bopp, M., Gutzwiller, F., Rössler, W., 2008. Suicide after bereavement: an overlooked problem. *Psychol. Med.* 38 (5), 673–676. <https://doi.org/10.1017/S0033291708002754>.

Angel, J.L., Jiménez, M.A., Angel, R.J., 2007. The economic consequences of widowhood for older minority women. *Gerontol.* 47 (2), 224–234. <https://doi.org/10.1093/geront/47.2.224>.

Antonucci, T.C., 2001. Social relations: an examination of social networks, social support, and sense of control. In: *Handbook of the psychology of aging*, fifth ed. Academic Press, pp. 427–453.

Antonucci, T.C., Akiyama, H., 1987. An examination of sex differences in social support among older men and women. *Sex Roles* 17 (11), 737–749. <https://doi.org/10.1007/BF00287685>.

Aspinwall, L.G., Taylor, S.E., 1992. Modeling cognitive adaptation: A longitudinal investigation of the impact of individual differences and coping on college adjustment and performance. *J. Pers. Soc. Psychol.* 63 (6), 989–1003. <https://doi.org/10.1037/0022-3514.63.6.989>.

Aspinwall, L.G., Taylor, S.E., 1997. A stitch in time: self-regulation and proactive coping. *Psychol. Bull.* 121 (3), 417–436. <https://doi.org/10.1037/0033-2909.121.3.417>.

Barrett, L.F., 1998. Discrete emotions or dimensions? The role of valence focus and arousal focus. *Cogn. Emot.* 12 (4), 579–599. <https://doi.org/10.1080/02699398379574>.

Bayaz-Ozturk, G., Burkhauser, R.V., Couch, K.A., Hauser, R., 2018. The effects of union dissolution on the economic resources of men and women: a comparative analysis of Germany and the United States, 1985–2013. *ANNALS Am. Acad. Political Soc. Sci.* 680 (1), 235–258. <https://doi.org/10.1177/0002716218793608>.

Belle, D., 1991. Gender differences in the social moderators of stress. *Columbia University Press*.

Bernheim, B.D., Carman, K.G., Gokhale, J., Kotlikoff, L.J., 2001. The mismatch between life insurance holdings and financial vulnerabilities: evidence from the survey of

consumer finances (Working Paper No. 8544). National Bureau Econ. Res. <https://doi.org/10.3386/w8544>.

George A. Bonanno, Camille B. Wortman, Darrin R. Lehman, Roger G. Tweed, Michelle Haring, John Sonnega, Deborah Carr, Randolph M. Nesse, 2002, Resilience to loss and chronic grief: A prospective study from preloss to 18-months postloss. Retrieved March 12, 2020, from: <https://psycnet.apa.org/fulltext/2002-18731-010.html?sr=1>.

Bound, J., Duncan, G.J., Laren, D.S., Oleinick, L., 1991. Poverty dynamics in widowhood. *J. Gerontol.* 46 (3), S115–S124.

Brickman, P., Campbell, D.T., 1971. Hedonic relativism and planning the good society. In: Appley, M.H. (Ed.), *Adaptation-Level Theory*.

Brickman, P., Coates, D., Janoff-Bulman, R., 1978. Lottery winners and accident victims: is happiness relative? *J. Pers. Soc. Psychol.* 36 (8), 917–927. <https://doi.org/10.1037/0022-3514.36.8.917>.

Bureau, U.C., n.d. Equivalence Adjustment of Income. The United States Census Bureau. Retrieved December 9, 2019, from: <https://www.census.gov/topics/income-poverty/income-inequality/about/metrics/equivalence.html>.

Callan-DC-Trends-Survey-2019.pdf. (n.d.). Retrieved March 23, 2020, from: <https://www.callan.com/wp-content/uploads/2019/04/Callan-DC-Trends-Survey-2019.pdf>.

Carr, D., 2004. Gender, preloss marital dependence, and older adults’ adjustment to widowhood. *J. Marriage Family* 66 (1), 220–235. <https://doi.org/10.1111/j.0022-2445.2004.00016.x>.

Chang, E.C., 1998. Dispositional optimism and primary and secondary appraisal of a stressor: controlling for confounding influences and relations to coping and psychological and physical adjustment. *J. Pers. Soc. Psychol.* 74 (4), 1109–1120. <https://doi.org/10.1037/0022-3514.74.4.1109>.

Chappell, N.L., 1989. Health and helping among the elderly: gender differences. *J. Aging Health* 1 (1), 102–120. <https://doi.org/10.1177/089826438900100107>.

Coulter, F.A.E., Cowell, F.A., Jenkins, S.P., 1992. Equivalence scale relativities and the extent of inequality and poverty. *Econ. J.* 102 (414), 1067–1082. <https://doi.org/10.2307/2234376>.

Diener, E., Lucas, R.E., Scollon, C.N., 2006. Beyond the hedonic treadmill: revising the adaptation theory of well-being. *Am. Psychol.* 61 (4), 305–314. <https://doi.org/10.1037/0003-066X.61.4.305>.

DiStefano, C., Zhu, M., Mindrila, D., 2009. Understanding and using factor scores: considerations for the applied researcher. *Pract. Assessment, Res. Evaluation* 14 (20).

Fellowes, M., Fichtner, J., Plews, L., Whitman, K., 2019. The retirement solution hiding in plain sight: How much retirees would gain by improving Social Security decisions. *Capital One-United Income White Paper*.

Gross, J.J., John, O.P., 2003. Individual differences in two emotion regulation processes: implications for affect, relationships, and well-being. *J. Pers. Soc. Psychol.* 85 (2), 348–362. <https://doi.org/10.1037/0022-3514.85.2.348>.

Gurung, R.A.R., Taylor, S.E., Seeman, T.E., 2003. Accounting for changes in social support among married older adults: insights from the MacArthur Studies of Successful Aging. *Psychol. Aging* 18 (3), 487–496. <https://doi.org/10.1037/0882-7974.18.3.487>.

Holden, Karen C., Burkhauser, R.V., Feaster, D.J., 1988. The timing of falls into poverty after retirement and widowhood. *Demography* 25 (3), 405–414. <https://doi.org/10.2307/2061540>.

Holden, K.C., Kuo, H.H., 1996. Complex marital histories and economic well-being: the continuing legacy of divorce and widowhood as the HRS cohort approaches retirement. *Gerontol.* 36 (3), 383–390. <https://doi.org/10.1093/geront/36.3.383>.

Hsu, J.W., 2016. *Aging and strategic learning: the impact of spousal incentives on financial literacy*. *J. Human Resources* 51 (4), 1036–1067.

Hurd, M., Wise, D., 1987. The Wealth and Poverty of Widows: Assets Before and After the Husband’s Death (No. w2325; p. w2325). National Bureau Econ. Res. Doi: 10.3386/w2325.

Johnson, R., Uccello, C., Goldwyn, J., 2003. Single Life vs. Joint and Survivor Pension Payout Options: How Do Married Retirees Choose? SOA.Org. <https://www.soa.org/resources/research-reports/2000-2006/research-single-life-vs-joint-and-survivor-pension-payout-options-how-do-married-retirees-choose/>.

Lamme, S., Dykstra, P.A., Groenou, M.I.B.V., 1996. Rebuilding the network: new relationships in widowhood. *Personal Relationships* 3 (4), 337–349. <https://doi.org/10.1111/j.1475-6811.1996.tb00120.x>.

Lawton, M.P., Brody, E.M., Saperstein, A.R., 1989. A controlled study of respite service for caregivers of Alzheimer’s patients. *Gerontol.* 29 (1), 8–16. <https://doi.org/10.1093/geront/29.1.8>.

Lazarus, R.S., 1984. On the primacy of cognition. *Am. Psychol.* 39 (2), 124–129. <https://doi.org/10.1037/0022-006X.39.2.124>.

- doi.org/10.1037/0003-066X.39.2.124.
- Lee, G.R., DeMaris, A., Bavin, S., Sullivan, R., 2001. Gender differences in the depressive effect of widowhood in later life. *J. Gerontol. Ser. B, Psychol. Sci. Social Sci.* 56 (1), S56–S61. <https://doi.org/10.1093/geronb/56.1.s56>.
- Lucas, R.E., Clark, A.E., Georgellis, Y., Diener, E., 2003. Reexamining adaptation and the set point model of happiness: reactions to changes in marital status. *J. Pers. Soc. Psychol.* 84 (3), 527–539. <https://doi.org/10.1037/0022-3514.84.3.527>.
- Lusardi, A., Mitchell, O.S., 2008. Planning and financial literacy: how do women fare? *Am. Econom. Rev.* 98 (2), 413–417. <https://doi.org/10.1257/aer.98.2.413>.
- McGarry, K., Schoeni, R.F., 2005. Widow(er) poverty and out-of-pocket medical expenditures near the end of life. *J. Gerontol.: Ser. B* 60 (3), S160–S168. <https://doi.org/10.1093/geronb/60.3.S160>.
- Merrill Lynch, n.d. Widowhood: The Loss Couples Rarely Plan For—And Should. <https://www.ml.com/articles/widowhood-the-loss-couples-rarely-plan.html>.
- Neal, R.E., 2019. Text - H.R.1994 - 116th Congress (2019-2020): Setting Every Community Up for Retirement Enhancement Act of 2019 [Webpage]. <https://www.congress.gov/bills/116th-congress/house-bill/1994/text>.
- Parkes, M.C., Brown, R.J., 1972. Health after bereavement: a controlled study of young Boston widows and widowers. *Psychosom. Med.* 34 (5), 449. https://journals.lww.com/psychosomaticmedicine/Citation/1972/09000/Health_After_Bereavement_A_Controlled_Study_of.8.aspx.
- Payne, C., Hedberg, E.C., Kozloski, M., Dale, W., McClintock, M.K., 2014. Using and interpreting mental health measures in the national social life, health, and aging project. *J. Gerontol.: Ser. B* 69 (Suppl_2), S99–S116. <https://doi.org/10.1093/geronb/gbu100>.
- Peters, A., Liefbroer, A.C., 1997. Beyond Marital Status: Partner History and Well-Being in Old Age. *J. Marriage Family*, 59 (3), 687–699. JSTOR. Doi: 10.2307/353954.
- Posner, J., Russell, J.A., Peterson, B.S., 2005. The circumplex model of affect: an integrative approach to affective neuroscience, cognitive development, and psychopathology. *Dev. Psychopathol.* 17 (3), 715–734. <https://doi.org/10.1017/S0954579405050340>.
- Radloff, L., 1975. Sex differences in depression. *Sex Roles* 1 (3), 249–265. <https://doi.org/10.1007/BF00287373>.
- Ritchev, F.J., La Gory, M., Fitzpatrick, K.M., Mullis, J., 1990. A comparison of homeless, community-wide, and selected distressed samples on the CES-depression scale. *Am. J. Public Health* 80 (11), 1384–1386. <https://doi.org/10.2105/AJPH.80.11.1384>.
- Sammer, J., 2018. Risk vs. Readiness: The 401(k) Plan Annuity Conundrum. SHRM. <https://www.shrm.org/resourcesandtools/hr-topics/benefits/pages/401k-plan-annuity-conundrum.aspx>.
- Sass, S.A., Sun, W., Webb, A., 2013. Social security claiming decision of married men and widow poverty. *Econom. Lett.* 119 (1), 20–23. <https://doi.org/10.1016/j.econlet.2013.01.007>.
- Sasson, I., Umberson, D.J., 2014. Widowhood and depression: new light on gender differences, selection, and psychological adjustment. *J. Gerontol. Ser. B: Psychol. Sci. Soc. Sci.* 69B (1), 135–145. <https://doi.org/10.1093/geronb/gbt058>.
- Scheier, M.F., Weintraub, J.K., Carver, C.S., 1986. Coping with stress: divergent strategies of optimists and pessimists. *J. Pers. Soc. Psychol.* 51 (6), 1257–1264. <https://doi.org/10.1037/0022-3514.51.6.1257>.
- Scheier, M., 1989. Dispositional optimism and recovery from coronary artery bypass surgery: The beneficial effects of physical and psychological well-being. *J. Pers. Soc. Psychol.*, 57, 1024–1040. Doi: 10.1037//0022-3514.57.6.1024.
- Shoven, J.B., Slavov, S.N., 2012. The Decision to Delay Social Security Benefits: Theory and Evidence (Working Paper No. 17866). National Bureau Econom. Res. Doi: 10.3386/w17866.
- Shoven, J.B., Slavov, S.N., Wise, D.A., 2017. Social Security Claiming Decisions: Survey Evidence (No. 23729; NBER Working Papers). National Bureau of Economic Research, Inc. <https://ideas.repec.org/p/nbr/nberwo/23729.html>.
- Shuart, A.N., Weaver, D.A., Whitman, K., 2010. Widowed before retirement: social security benefit claiming strategies. *J. Financial Planning*. April 2010.
- Smith, K.R., Zick, C.D., 1986. The incidence of poverty among the recently widowed: mediating factors in the life course. *J. Marriage Family* 48 (3), 619–630. <https://doi.org/10.2307/352048>.
- Social Security Administration "Benefit Planner: Retirement", Accessed date: March 2020.
- Social Security Administration. "Benefits Planner: Retirement.", Accessed date: March 2020.
- Stanford Center on Longevity. 2018. Seeing Our Way to Financial Security in the Age of Increased Longevity. Retrieved July 11, 2019, from <http://longevity.stanford.edu/2018/10/22/seeing-our-way-to-financial-security-in-the-age-of-increased-longevity-2/>.
- Stroebe, M.S., Stroebe, W., 1983. Who suffers more? Sex differences in health risks of the widowed. *Psychol. Bull.* 93 (2), 279–301. <https://doi.org/10.1037/0033-2909.93.2.279>.
- Stroebe, M.S., Stroebe, M.S., 1987. Bereavement and health: the psychological and physical consequences of partner loss. Cambridge University Press doi: 10.1017/CBO9780511720376.
- Tach, L.M., Eads, A., 2015. Trends in the economic consequences of marital and cohabitation dissolution in the United States. *Demography* 52 (2), 401–432. <https://doi.org/10.1007/s13524-015-0374-5>.
- Thurstone, L.L., 1935. *The Vectors of Mind: Multiple-factor Analysis for the Isolation of Primary Traits*. University of Chicago Press.
- Umberson, D., Wortman, C.B., Kessler, R.C., 1992. Widowhood and Depression: Explaining Long-Term Gender Differences in Vulnerability. *J. Health Social Behavior*, 33(1), 10–24. JSTOR. Doi: 10.2307/2136854.
- VanDerhei, J., Copeland, C., 2001. The Changing Face of Private Retirement Plans (SSRN Scholarly Paper ID 267501). Social Sci. Res. Network. <https://papers.ssrn.com/abstract=267501>.
- Weir, D., Willis, R.J., Sevak, P., 2002. The economic consequences of widowhood. *SSRN Electron. J.* <https://doi.org/10.2139/ssrn.1084677>.
- WISER, n.d. The Financial Impact of Widowhood. <https://www.wiserwomen.org/news/the-financial-impact-of-widowhood/>.
- Zajonc, R.B., 1984. On the primacy of affect. *Am. Psychol.* 39 (2), 117–123. <https://doi.org/10.1037/0003-066X.39.2.117>.
- Zick, C.D., Holden, K., 2000. An assessment of the wealth holdings of recent widows. *J. Gerontol. Ser. B: Psychol. Sci. Social Sci.* 55 (2), S90–S97. <https://doi.org/10.1093/geronb/55.2.S90>.
- Zick, Cathleen D., Smith, K.R., 1986. Immediate and delayed effects of widowhood on poverty: patterns from the 1970s. *Gerontol.* 26 (6), 669–675. <https://doi.org/10.1093/geront/26.6.669>.
- Zick, C.D., Smith, K.R., 1991. Patterns of economic change surrounding the death of a spouse. *J. Gerontol.* 46 (6), S310–S320.