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WORKING PAPER SERIES

RETIREMENT, SOCIAL SUPPORT AND MENTAL WELLBEING: A COUPLE-LEVEL ANALYSIS

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A more recent version of this paper was published as Kettlewell N and Lam J. (2022) Retirement, social support and mental well-being: a couple-level analysis. European Journal of Health Economics, 23, 511-535. DOI: 10.1007/s10198-021-01374-1

No. 2020-15
June 2020

NON-TECHNICAL SUMMARY

Social support is increasingly acknowledged as an important resource for promoting wellbeing. Social capital and support may however decrease across the retirement transition if this results in the severance or disruption of existing ties and relationships. Conversely, social capital and support may increase if retirement provides new opportunities to strengthen existing ties or develop new relationships. Given this, we test whether social support changes around retirement. We also examine whether social support is an important factor for explaining dynamics in mental wellbeing around retirement and consider both own and spouse's retirement.

Using longitudinal data from Australia, we find little effect of own or spouse's retirement on social support. However, in fixed-effects models, dynamics in mental wellbeing are significantly different between those with low/high social support. Low social support types experience worsening mental wellbeing as they approach retirement, but improvements in wellbeing after retirement, on average. Further, for those eligible for the Age Pension, own retirement causally improves mental wellbeing for women (weaker evidence for men) and by a similar degree for those with low/high social support. The spillover benefits of spousal retirement on life satisfaction are much larger for individuals with low social support. This supports the idea that spousal retirement can improve wellbeing for people lacking social support, at least for retirements induced by Age Pension eligibility.

Retirement is a significant life event, and a rich body of literature has emerged around antecedents and consequences of retirement. While a range of outcomes have been examined, there has been little research on whether and how social support may evolve around retirement. Our paper provides novel evidence on the evolution of social support during own and spouse's retirement, and its moderating effect on mental wellbeing.

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ACKNOWLEDGEMENTS

This research was supported by the Australian Research Council Centre of Excellence for Children and Families over the Life Course (project number CE140100027). The Centre is administered by the Institute for Social Science Research at The University of Queensland, with nodes at The University of Western Australia, The University of Melbourne, and The University of Sydney. This paper uses unit record data from the Household, Income and Labour Dynamics in Australia (HILDA) Survey. The HILDA Project was initiated and is funded by the Australian Government Department of Social Services (DSS) and is managed by the Melbourne Institute of Applied Economic and Social Research (Melbourne Institute). The findings and views reported in this paper, however, are those of the author and should not be attributed to either DSS or the Melbourne Institute. Equal authorship; authorship order listed alphabetically.

ABSTRACT

Social support is increasingly acknowledged as an important resource for promoting wellbeing. We test whether social support changes around retirement. We also examine whether social support moderates dynamics in mental wellbeing around retirement and consider both own and spouse's retirement. Using longitudinal data from Australia, we find little effect of own or spouse's retirement on social support. However, in fixed-effects models, dynamics in mental wellbeing are significantly different between those with low/high social support. Using pension eligibility as an instrument, we find that own retirement causally improves mental wellbeing for women (weaker evidence for men) and by a similar degree for those with low/high social support. We also estimate responses to life satisfaction and find evidence that spill-over benefits from spousal retirement are much larger for individuals with low social support.

Keywords: retirement; social support; Australia; couples; mental wellbeing

Suggested citation: Kettlewell, N. & Lam, J. (2020). 'Retirement, Social Support and Mental Wellbeing: A Couple-Level Analysis'. Life Course Centre Working Paper Series, 2020-15. Institute for Social Science Research, The University of Queensland.

1. Introduction

Social capital is an important resource for individuals and has been linked with a variety of positive health outcomes (d'Hombres, Rocco, Suhrcke & McKee 2010; Ho 2014; Ronconi, Brown and Scheffler 2012). It enables the exchange of goods and information, as well as instrumental and social support, which can improve the wellbeing of individuals within specific networks. In addition to health, social capital may shape behaviour. Lancee and Radl (2012) show that Germans with greater social capital, defined as frequent social contacts with friends, relatives and neighbours, opt for earlier retirement. This highlights social capital as a factor that matters for prompting individuals' transition from work to retirement. Social capital and social support in retirement are equally important. Several studies report that social capital explains variation in health and well-being amongst the retired (Wang and Matz-Costa 2019). Higher levels of social support and social reciprocity is also related to higher retirement satisfaction (Wang and Matz-Costa 2019).

Social capital and social support may decrease across the retirement transition if this results in the severance or disruption of existing ties and relationships. Conversely, social capital and support may increase if retirement provides new opportunities to strengthen existing ties or develop new relationships. Retirement involves a significant change in time available for non-work activities – the ability to convert this time into activities that would improve wellbeing may depend on having high social capital and support. On the other hand, people with low social capital at retirement may benefit disproportionately from extra time with e.g. their spouse and family. Breaks to social networks associated with the workplace could also lead to social isolation and loneliness for those deriving social support from these networks.

In this paper, we focus on the retirement transition and document the relationship between time to/from retirement and social support and mental wellbeing. We extend existing work in three main ways. First, we investigate how both social support and mental wellbeing evolve before and after retirement. Second, we consider social support as a potential moderator in the relationship between retirement and mental wellbeing. Third, we estimate responses in social support and mental wellbeing to both own and spouse's retirement. We also consider differences in outcomes by gender and for a broader population of retirees than most existing work. Our main analysis utilizes Australian panel data to estimate individual fixed effects event-study type models around the retirement transition (focusing on couples). As an extension, we also consider the causal effect of retirement by using Age Pension eligibility as an instrumental variable.

The limited existing research on retirement and social engagement is equivocal. Sabbath et al (2015) find that individuals report increased activity engagement and number of friends after retirement. However, they also point out that individuals from lower socioeconomic status backgrounds and those with poorer health are more likely to report decreased engagement upon retirement compared to their counterparts. van den Bogaard, Henkens and Kalmijn (2014) report that Dutch retirees engage in more support to their children and volunteering upon retirement, arguing that people seek continuity in social activities to replace interactions lost through leaving the workplace. Eibich (2015) exploits age pension thresholds to identify the mechanisms through which retirement affects health in Germany. He finds no effect of retirement on number of close friends. Fletcher (2014) uses a similar estimation strategy for a pooled sample of European countries and obtains comparable results. Studies exploiting age pension thresholds in Australia have found evidence that retirement increases some identifiers that may be linked to social capital, such as group membership and volunteering (Nguyen et al, 2020). Atalay and Zhu (2018) provide similar evidence for men's response to their wife's retirement.

Our paper contributes to this small set of studies around retirement and social capital. However, it differs from existing studies in important ways. First, our focus on social support differs from studies that equate social capital to social engagement behaviors. We measure social support through a 10-item questionnaire that focuses on feelings of loneliness and social support. While social capital has been operationalized differently across studies, such as membership in organisations, trust, and social isolation (D'Hombres et al. 2010), measures of social engagement and religious participation and provision of support to others (Gannon and Roberts 2020), or informal social interactions (Ronconi, Brown and Scheffler 2012), our measure is arguably more comprehensive, and focuses on the subjective aspects of social capital. Second, we estimate the effects of retirement for a representative sample. Previous studies have generally focused on narrow groups of retirees, such as those incentivized to retire by age pension rules. Third, our estimation strategy differs from previous work. We focus on dynamics around retirement and treat social support as a moderator for mental wellbeing. Fourth, we consider both responses to own and spouse's retirement. Finally, we consider how social support evolves in the years before and after retirement. Other studies generally do not consider the temporal effects of retirement, or do so in a highly parametric way.

Our study also contributes to a small literature on the effect of own retirement on mental wellbeing. Most studies point to positive effects (e.g. Atalay & Barret, 2014; Gorry et al. 2018; Jokela et al. 2010; Manty et al. 2018; Mein et al. 2003; Oksanen et al. 2011; Zhu,

2016). However, some studies find no effect (Leinonen et al. 2013) and negative (Dave, Rashad & Spasojevic 2008; Vo et al. 2015) or mixed effects (Piccio & van Ours, 2019). Even fewer studies consider the effect of spouse's retirement on own wellbeing. Quantifying these spill-over effects is important for understanding the overall role of retirement on people's wellbeing. Existing research suggests female partner's retirement (induced by age pension eligibility) may be good for the mental health of men in Australia (Atalay and Zhu 2018). Bertonni & Brunello (2017) exploit similar reforms and find negative effects on mental health for women when male spouses retire in Japan. Piccio & van Ours (2019) use a regression discontinuity design and find divergent responses to own and spouse's retirements between male and female partners in the Netherlands. Overall, their estimates generally point to sharp improvements in mental health when male partners retire but not female partners.

We identify the dynamic effects of retirement by estimating individual fixed effects models within an event study design. Although we control for health, we cannot rule out other time varying confounders or reverse causality. Consequently, we interpret our main estimates within a descriptive paradigm. While much of the literature has focussed on estimating causal effects, we argue that inherently descriptive estimates like ours provide important evidence that quasi-experimental studies typical of the retirement literature do not. Our results speak to the outcomes of the general population of retirees. Estimates exploiting policy rules like age pension eligibility can only identify a local average treatment effect (LATE), which may not generalize to the broader population. Relatedly, for the purpose of resource targeting, causality is often second order. For example, our study can speak to whether (and when) mental health services should typically be deployed to people during the retirement transition; causal LATE estimates for narrow population groups are less suited to this. Finally, descriptive analyses are useful in developing hypotheses that can be tested using experimental or quasi-experimental designs.

With that said, institutional settings in Australia also allow us to estimate local causal effects by exploiting conditionally exogenous variation in Age Pension eligibility. We therefore estimate fixed effects instrumental variables (FE-IV) models using Age Pension eligibility as an instrument as an extension to our main results. Our FE-IV approach follows several recent Australian studies (e.g. Zhu 2016; Atalay & Zhu 2018; Atalay et al. 2019; 2020; Nguyen et al. 2020).

Our event study results can be summarized as follows. There is little evidence that social support changes (on average) around own retirement within a four-year window of the event

date. There is some evidence that social support responds positively to spouse's retirement (to a similar degree for males and females) but this takes 3-4 years to materialize. Mental wellbeing is fairly stable for those who enter retirement with high social support. In contrast, low social support types experience declining mental wellbeing in anticipation of retirement and (for males but not females) improved social support after retirement. Response patterns are similar around spouse's retirement, but generally less pronounced.

When we instrument for retirement using Age Pension eligibility, we do not find evidence that own or spouse's retirement affects social support. Our estimates however suggest that retirement causally improves mental wellbeing for females, and to a similar degree for low/high social support types. The point estimates suggest a similar conclusion for males, but these estimates are smaller in magnitude and less precise. We find weak evidence for spill-over effects from spouse's retirement on own mental wellbeing for women with low social support. When we use life satisfaction as an outcome variable, we find stronger evidence for spill-over effects for both genders, and again which disproportionately benefit those with low social support. Altogether, our results support the idea that spousal retirement can improve wellbeing for people lacking social support, at least for retirements induced by Age Pension eligibility.

The paper is organized as follows. In Section 2 we discuss our data. In Section 3 we set out the empirical approach. In Section 4 we present results, which are discussed in Section 5. Section 6 concludes.

2. Data

Our study uses data from the Household, Income and Labour Dynamics in Australia Survey (HILDA), a representative, annual household panel of Australian households. We use data from all 18 currently available waves (2001-2018). Since our study is interested in transitions within couples, for our main analysis we limit the sample to an unbalanced panel of those who are partnered (married or defacto), with both partners responding to the survey in the particular year.

The key variables for our study are retirement status, social support and mental wellbeing, which are described below.

Retirement status – for our main analysis, we identify retirement from people's responses to the life events module ("did any of these happen to you in the past 12 months?"), which

is part of HILDA's self-completion questionnaire in every wave except wave 1. We primarily focus on retirements occurring between ages 55-70 years. Retirements are more likely to be normative and comparable within a restricted age-range.

Some people report multiple retirements, which may occur if they retire and then return to the workforce. We only consider the first retirement reported in HILDA and treat any post-retirement employment dynamics as potential mechanisms. In Appendix B we show that dropping people with multiple retirements does not change our conclusions.

Social support – we follow Flood (2005) in constructing a social support index based on responses to 10 questions about social support answered on a 7-point scale. These questions are:

1. People don't come to visit me as often as I'd like.
2. I often need help from other people but can't get it.
3. I seem to have a lot of friends.
4. I don't have anyone I can confide in.
5. I have no one to lean on in times of trouble.
6. There is someone who can always cheer me up when I'm down.
7. I often feel very lonely.
8. I enjoy the time I spend with the people who are important to me.
9. When something's on my mind, just talking with the people I know can make me feel better.
10. When I need someone to help me out, I can usually find someone.

We convert each question into a variable taking on values -3,-2,…,2,3, with higher values indicating higher support, and then take the mean of the 10 items as our index. This index has mean = 15.5 (sd = 9.1, n = 1,319) in the year before retirement, and its distribution is left skewed (see Figure 1). Only a small fraction (3.6%) of people are right censored and no one is left censored. Berry and Welsh (2010) show that the index predicts better general and mental health, levels of tangible support, trust, and sense of reciprocity. Milner et al. (2016) find that those with higher scores experience less severe mental health effects from unemployment. Their findings are closely related to our focus on social support as a potential moderator for mental wellbeing in retirement.

Mental wellbeing – we measure mental wellbeing through the Mental Component Summary (MCS) (see Ware, 2000). The MCS is derived from a subset of questions about psychological distress and positive/negative affect contained in the SF-36 – one of the world's most widely used self-completion health questionnaires. MCS values range from 0-100, with higher values corresponding to better mental wellbeing. Figure 1 shows its distribution for our sample in the year before retirement (mean = 77.2, sd = 16.4, n = 1,347). As an extension, later we also consider stated life satisfaction as an outcome variable.

3. Methodology

Linear fixed effects regression

We estimate event-study type linear fixed effects models to quantify the dynamic effect of retirement on social support and mental wellbeing. To determine whether social support moderates the effect of own and spouse's retirement on mental wellbeing, we estimate separate models for those with low/high social support, defined as being below/above median for retirees in the year prior to retirement (or for spouses of retirees in the year prior to spouse's retirement, depending on our focus). Our most general specification is:

$$Y_{it} = \alpha_i + \sum_{p=-4}^{4} \beta_p Retire_{it,p} + \sum_{p=-4}^{4} \delta_p SpouseRetire_{it,p} + t_t + \boldsymbol{X'_{it}\Omega} + \epsilon_{it}. \qquad (1)$$

Y_{it} is either social support or mental wellbeing (standardized using the mean and standard deviation in the year before retirement) for person i in year t. α_i is an individual specific fixed effect. $Retire_{it,p=-4}$, … $Retire_{it,p=4}$ are dummies for if i will retire in 3-4 years' time, … up to if they retired 3-4 years ago. $SpouseRetire_{it,p=-4}$,… $SpouseRetire_{it,p=4}$ is equivalently defined for dates to/from the spouse's retirement. The coefficients $\beta_{-4}, \ldots \beta_4$ ($\delta_{-4}, \ldots \delta_4$) map out the time path of anticipation and adaptation around retirement over a four-year window. We decided on four years because this broadly matches the transition periods considered in related studies (e.g. Nielsen 2019; Westerlund et al. 2009) and captures the period by which most people adapt to life events in Australia (Kettlewell et al. 2020). t_t is a vector of year fixed effects. $\boldsymbol{X}$ is matrix containing controls for five-year age groups (e.g. 60-64) and a dummy for having any long-term health condition. ϵ_{it} is a stochastic error term.

We do not include other time varying controls in Eq. (1) (e.g. income) in case these are mechanisms. We do however control for health shocks (whether the person has a long-term

health condition) to net-out mental health effects due to health induced retirements. When we estimate Eq. (1), we restrict the sample only to those people for whom we observe a retirement event (own or spouse's, depending on our focus), and the retirement occurred within ± 4 years. In this context, individual fixed effects are helpful because they reduce any selection bias stemming from the unbalanced nature of the panel. To see this, note that the coefficients $\hat{\beta}_{-4}, \hat{\beta}_{-3}$ (and so on) will be identified by strongly overlapping, but distinct, subsets of people in our dataset. Individual fixed effects make it more reasonable to treat our estimates as if we are following a balanced group of individuals.

Our approach mitigates bias due to time invariant factors, linear ageing and collective sentiment (t_t) and crudely for non-linear ageing through the age-group dummies. It also controls for health shocks through the long-term conditions dummy. However, estimates from Eq. (1) can only be considered causal if there is no selection into retirement based on other time variant factors, and no reverse causality. In practice, retirement may be induced by unobserved events that may directly affect mental wellbeing and social support. Since it is not possible to convincingly control for all possible time varying confounders, we interpret our estimates within a descriptive paradigm. Importantly, our results are informative in mapping out how people's mental wellbeing evolves around retirement – information that can inform policy making and clinical advice regardless of underlying causal channels.

Fixed effects instrumental variables (IV) regression

There is also value in understanding whether there are causal retirement effects. We therefore follow other papers that exploit Age Pension reforms as an extension to our main descriptive approach. We utilize the discrete changes in Age Pension eligibility for men and women. For women, there has been a gradual increase in Age Pension eligibility for cohorts born after 1 July 1935, as shown in Table 1. For men, the eligibility age is 65 years but will increase to 67 years by 2023. Under the assumption that, conditional on a polynomial in age, individual fixed effects, and other time varying controls, these eligibility cut-offs have no direct effect on social support or mental wellbeing, they can be used as IVs by estimating the following first stage equation:

$$Retire_{it} = \alpha_i + E_{it} + \boldsymbol{X}'_{\boldsymbol{it}}\widetilde{\boldsymbol{\Omega}} + \tau_t + e_{it} \quad (2)$$

In Eq. (2), E_{it} (the instrumental variable) is an indicator for Age Pension eligibility. α_i and τ_t are again individual and time fixed effects. The second stage equation is given by:

$$Y_{it} = \alpha_i + \widehat{Retire}_{it} + \boldsymbol{X}'_{\boldsymbol{it}}\boldsymbol{\Omega} + \tau_t + \epsilon_{it} \quad (3)$$

$\widehat{Retire}$ are the fitted values from Eq. (2). Eq. (3) is estimated via two-staged least squares fixed effects regression (FE-IV). This model is similar in spirit to a regression discontinuity design using a global control function. It is not feasible to adopt the event study framework outlined above for the FE-IV model so instead we focus on the level effect of retirement after following related studies and restricting our sample to those aged 55-75 years (or whose spouse is aged 55-75 years, depending on our focus).[1] We also include both singles and couples (except when we focus on spouse's retirement). Because we are now interested in causal effects, we include additional controls in $\boldsymbol{X}$ typical of related studies. These include a quadratic in age, state fixed effects, marital status, and controls for dependent children of various ages. We also include a quadratic for spouse's age when we focus on spousal retirement. We do not control for income and instead allow for this as a potential mechanism (in Appendix C we show that controlling for household income has little effect on the estimates). When we split the sample by low/high social support, the threshold is based on the median level of social support based on the within-means for all people aged 55-75 years. This differs from our event study analysis, where we use social support of retirees in the year before retirement to distinguish groups.

Our estimates are local to those induced to retire due to the Age Pension rules. The Age Pension is widely accessed in Australia. According to population weighted estimates from HILDA, in 2018 52% of retirees were receiving some income from the Age Pension (67% for those above Age Pension Age). In the 2019-20 financial year, the maximum pension amount for a single person (including supplements) was $944.30 (AUD) per fortnight. By way of comparison, the national minimum wage was $1,481.60 for a 38-hour work week. Pensioners are also eligible for various State-level concessions for services like public transport and utilities. Atalay and Barrett (2015) show that increased eligibility age reforms lowered the probability of retirement for women by 12-19 percentage points. Against this, the Age Pension can be seen as an important incentive for a non-trivial share of Australians. Nevertheless, it bears repeating that results from our IV regressions will be less generalizable than our main fixed effects estimates.

[1] Our IV approach requires that we include non-retirees to estimate the first stage. However, we do not know whether non-retirees will retire in the future, which introduces non-random measurement error in the anticipation indicators (our lag retirement terms suffer from the same issue for retirees we do not observe entering retirement). Further, we would require as many instruments as event-time indicators; in preliminary work we found that lags and leads of the eligibility indicator were sometimes weak instruments for the event-time indicators. This would have made the coefficients difficult to interpret within an event study framework.

4. Results

Own retirement on social support (Figure 2)

To begin we restrict the sample to people in couples observed within ±4 years of their own retirement and estimate Eq. (1) on social support.[2] We present results in event-study style graphs using the year before retirement as the baseline period and relegate detailed tables to Appendix A. We estimate four versions of Eq (1): (i) full sample without conditioning on partner's retirement; (ii) full sample and full specification; (iii) only males, full specification; and (iv) only females, full specification. Estimates from (i) indicate no significant effect of retirement on social support. If anything, social support slightly improves in anticipation of retirement and is flat thereafter. Conditioning on partner's retirement has virtually no impact on the estimates, suggesting this is not an important confounder of own retirement. Finally, none of the gender differences are statistically different, and neither men nor women experiences any significant deviations in social support.

Own retirement on mental wellbeing (Figure 3)

Next we turn to mental wellbeing and stratify by low/high social support, defined as below/above median in the year before retirement. There are striking differences in the trajectories for these groups; the low social support group experiences lower mental wellbeing year-on-year in anticipation of retirement (relative to the year before) and then a modest improvement post-retirement. In contrast, high social support types do not experience any significant fluctuations in mental wellbeing during the transition. This pattern is robust to conditioning on partner's retirement and is similar for males and females, although differences are generally not statistically significant for females.

Spouse's retirement on social support (Figure 4)

We now focus on own responses to spouse's retirement. Overall, social capital is improving fairly linearly both in anticipation of retirement and post-retirement. By 3-4 years post-retirement, social support is statistically significantly greater than in the year before retirement. Results are robust to conditioning on own retirement. If anything, males enjoy slightly stronger returns; however, differences between genders are not significant.

[2] For representability we include the small number of same-sex couples (<0.004%) in our event-study analysis. However, since sex may affect response to pension reforms, we do not include them in our IV analysis when we focus on response to spouse's retirement.

Spouse's retirement on mental wellbeing (Figure 5)

Mental wellbeing follows a similar trajectory around spouse's retirement as own retirement for the low social support group – it declines in anticipation of retirement and increases post-retirement. For high social support types, there is some evidence mental wellbeing dips 1-2 years pre-retirement and temporarily post-retirement, particularly for females. For males, mental wellbeing is significantly higher than the year before retirement after 2-3 years. In contrast to the results for own retirement, our estimates are generally not precise enough to rule out the same trajectories for low/high social support, although qualitatively they seem to differ.

Results for singles and divorcees, separated or widowed

We focus on couples in this study because we are interested in responses to own and spouse's retirement. Couples also comprise the largest share of retirees in terms of marital status group (approximately 70% in our sample). In the Online Appendix, we present estimates for (i) singles (Figures B5 and B6) and (ii) divorcees, separated or widowed (Figures B7 and B8); for brevity we only discuss the main features of those results here.

Overall, there is no strong evidence that social capital or mental wellbeing fluctuate in any systematic way for groups (i) or (ii). There is some evidence that mental wellbeing improves in anticipation of retirement for females with high levels of social support. The sample sizes are smaller for these groups (especially singles) so the estimates are less precise than for couples.

FE-IV results

Our IV estimates are reported in Tables 2 and 3. In all models, Age Pension eligibility is a highly significant predictor of retirement. Our main models suggest that eligibility raises the probability of retirement by approximately 9 percentage points for women and 13 percentage points for men.

An important difference between this analysis and our analysis above is that we identify retirement from different information. Retirement is determined based on self-reported retirement variables (whether retired, age of retirement) and confirmed with labour force status, rather than using the life event question.[3] This is because the life event question

[3] A person is deemed retired if they self-report as retired in the years this question is asked and also are not in the labour force, or self-reported as retired in a previous wave and are not currently in the labour force for years retirement is not specifically asked about. Our conclusions do not

can only capture retirements where people are surveyed in the year they retired. In Appendix B (Figures B9-B12) we repeat our event study analysis using this alternative definition of retirement. The estimates are similar, and our conclusions are largely unchanged.

We do not find evidence that own retirement or spouse's retirement causally affects social support for either men or women. We do however find that own retirement improves mental wellbeing for women. This is in line with previous research exploiting the Australian Age Pension reforms (Atalay & Barret 2014; Zhu 2016). A novel finding is that this effect is consistent between low and high social support types. For men, our FE-IV estimates indicate a marginally significant improvement in mental wellbeing. The point estimates are positive for low/high social support types but not significant. Overall, retirement seems to have a larger positive effect on women's mental wellbeing than men's.

Our pooled estimates suggest no effect of male spouse's retirement on female's mental wellbeing. When we split the sample by social support group, we find weak evidence that women with low levels of social support experience improved mental wellbeing, and a test on the equality of coefficients for low/high social support types is only marginally insignificant ($p = 0.061$). The estimate for low support types is significantly different from zero at the 5% level if we control for income (Table C1). None of our estimates for men's mental wellbeing following spouse's retirement are significant, although the point estimates are in the direction of positive effects. In contrast, Atalay and Zhu (2018), use a similar specification and the same dataset and conclude that spouse's retirement does improve men's mental wellbeing. Our results may differ in part because we adopt a different definition of retirement and impose different sample restrictions. Social support does not appear to have a moderating effect for men either, although the instrument is only borderline relevant when we focus on these groups ($F = 13.0$ for low social support types, $F = 8.8$ for high types).

Life satisfaction

We have focused on the MCS score as our measure of mental wellbeing because it captures symptoms of mental distress and emotions and is therefore closely related to notions of good mental health, which is important from the perspective of service provision. An alternative measure of wellbeing, tied more closely to cognitive self-evaluation, is stated

change if retirement is defined more simply as non-labour force participation (see Appendix Tables C1 and C2, panel B).

life satisfaction. Kettlewell et al. (2020) show that for a variety of life events, responses to affective wellbeing and life satisfaction differ. Some economists argue that promoting life satisfaction should be a central objective of government (Frijters et al. 2020). This motivates exploring the effect of retirement reforms on life satisfaction.

To this end, we replace the MCS score with stated life satisfaction (satisfaction with life overall, on an 11-point scale) and re-estimate our FE and FE-IV models.[4] Our estimates on own retirement serve as a useful replication of a recent study using the same dataset (Nguyen et al. 2020), while our estimates by social support level and for responses to spouse's retirement are new. For brevity we report the estimates in Appendix Tables C1 and C2 (panel D).

As with the MCS score, women's life satisfaction responds positively to retirement. We also again find that low social support women benefit from male spouse's retirement, while we cannot rule out nil effects for high social support women (although this difference is not statistically significant [P = 0.115], reflecting the large standard errors). Compared to our MCS results, there is much stronger evidence for a positive effect of own retirement for males. This effect is similar by social support type. Further, there is a large improvement in life satisfaction for males following spouse's retirement, whereas we find no effect for mental wellbeing. As for women, the effect is much stronger for low social support types and we cannot rule out nil effects for high social capital types (P = 0.116 for the difference between groups).

5. Discussion

In setting retirement policy and managing population wellbeing during the retirement transition, public health officials are interested in the social and psychological resources of people entering retirement and who are retired. Quantifying the total effect of any policy also requires understanding the spill-over effects of retirement from one spouse to another.

Our results show interesting patterns in how social support and mental wellbeing evolve around retirement. Own retirement has little effect on social support – in our baseline estimations we can rule out any post-retirement effects greater than 0.06 standard

[4] For completeness, we also repeated our event study analysis using life satisfaction as the dependent variable and report figures in Appendix B (Figures B13-B14). The results show life satisfaction improving over the transition for own retirement, particularly for high support males and low support females. Responses to spouse's retirement are generally in the direction of improving life satisfaction over the transition for those with low social support, which is consistent with the IV results. However, the magnitudes of these effects are much smaller.

deviations in each year. It seems that social support, on average, is stable during the retirement transition, consistent with research that finds retirement plays a limited role in shaping individuals' social network and composition (Fletcher 2014). We also find no evidence in our IV analysis that social support responds to retirement. Spouse's retirement seems to matter more (at least for males). This hints at the value of a retired spouse to provide social support to their partner.

Our results point to the efficacy of social support as a flag for disparate trajectories in mental wellbeing around retirement. Low social support types in couples experience worsening mental wellbeing as they approach retirement, but improvements in wellbeing after retirement, on average. High social support types experience stable levels of wellbeing and when we pool sexes, we can rule out effects of around ±0.1 standard deviations in each year. The trajectories for mental wellbeing are broadly similar following spouse's retirement as own retirement, but less precise.

Our IV results suggest that retirement causally improves mental wellbeing for females induced to retire by pension eligibility, and to a similar degree for low/high social support types. The point estimates suggest a similar conclusion for males, but these estimates are smaller in magnitude and less precise.

We find only weak evidence for spill-over effects from spouse's retirement on own mental wellbeing in our causal analysis. For males, the FE estimates suggest a small improvement in mental wellbeing, but this effect is not significant when we use FE-IV. For females, the FE-IV estimate is marginally significant for low social support types. The point estimates (which generally point to positive effects) are fairly imprecise, so we caution against a strong conclusion of no spill-over effects based solely on our study.

When we use life satisfaction as a dependent variable we find stronger evidence that own retirement is beneficial for men, and that spouse's retirement benefits both men and women with low social support. Altogether, our results support the idea that spousal retirement can improve wellbeing for people lacking social support, at least for retirements induced by Age Pension eligibility.

Finally, it is worth commenting on the disparities between the event study and IV results. It is difficult to directly compare our event study estimates to the IV estimates because they necessarily use a different sample (which includes non-couples), different definition of retirement, different definition of low/high social support, only consider the level effect,

and are identified by those induced to retire due to the Age Pension. Nevertheless, we find it interesting that our IV estimates suggest much stronger effects on mental wellbeing than our event study estimates. Our FE estimates that use the same sample construction as our FE-IV analysis are also generally close to zero and insignificant, with relatively small confidence intervals. If the LATE estimates for Age Pension induced retirees are indicative of the general causal effects of retirement, this seems to suggest very strong negative selection into retirement based on mental wellbeing. Alternatively, our results may indicate substantial heterogeneity in the effects of retirement. In countries like Australia, and across Europe (where much of the literature on retirement exploiting age pension rules is based), people who retire because of age pensions are likely to be lower income and may experience little change, or even an improvement, in financial security after retirement. It is not clear that this narrow group reflect the average retirement experience. Arguably, they could benefit more from retirement than the typical retiree. Since so much evidence on retirement draws on these reforms, it is important to recognize this limitation and to consider estimates that use alternative sources of identification, even when establishing causality is challenging.

6. Conclusion

Retirement is a significant life event, and a rich body of literature has emerged around antecedents and consequences of retirement. While a range of outcomes have been examined, there has been little research on whether and how social support may evolve around retirement. This is despite the fact that social support has been linked with various wellbeing outcomes and is an important outcome in its own right. Given scholars have been concerned with whether retirement is a critical point at which disparities in social engagement may occur (Sabbath et al. 2015), this underscores the potential value of research in examining changes in social support as perceived by individuals around retirement. The value of research in this area is further underpinned by the population ageing occurring in most developed countries.

Our paper provides novel evidence on the evolution of social support during own and spouse's retirement, and its moderating effect on mental wellbeing. Future research using different dimensions of social engagement, social capital and social integration, and across different institutional settings, would be highly worthwhile.

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Figure 1: Distributions – social support and mental wellbeing in the year before retirement (coupled retirees)

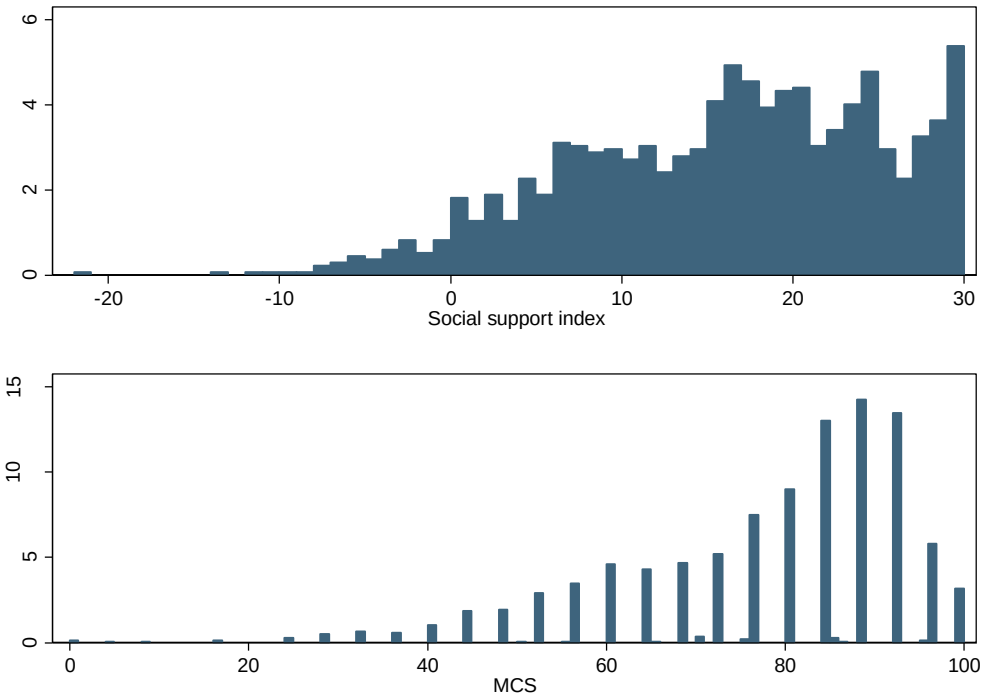
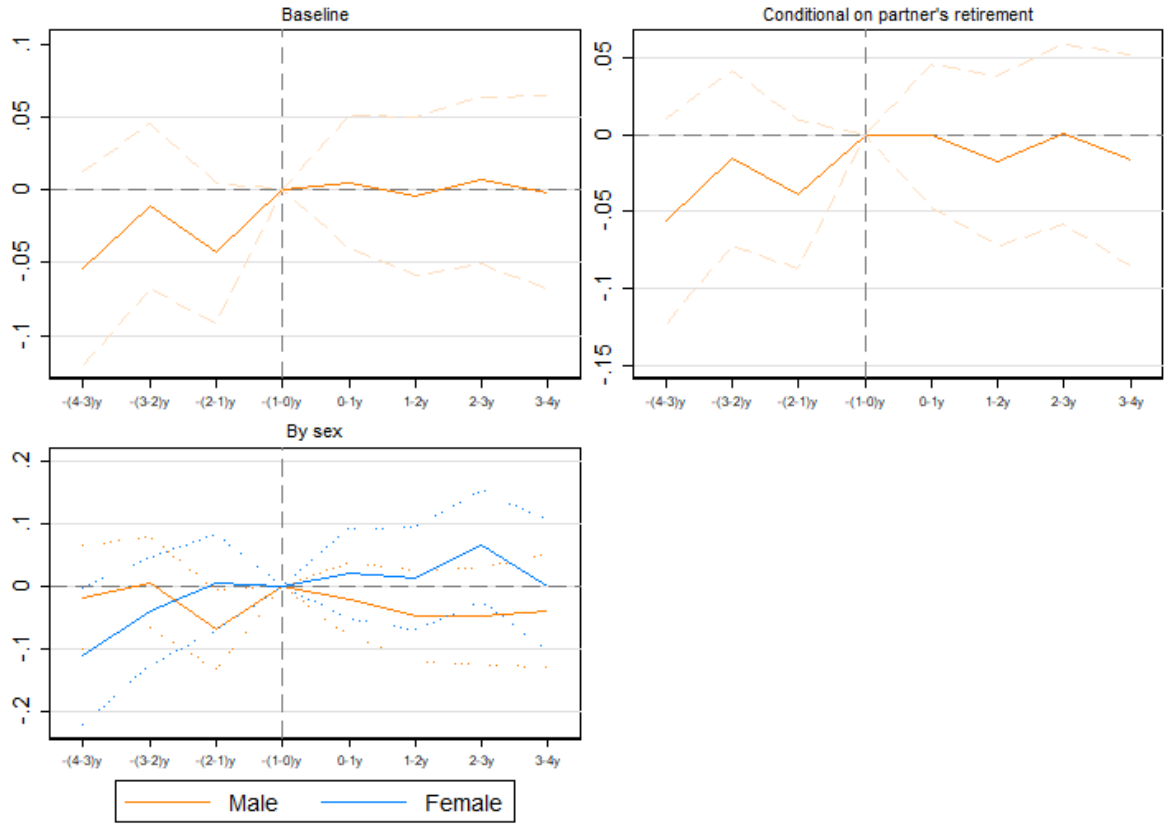
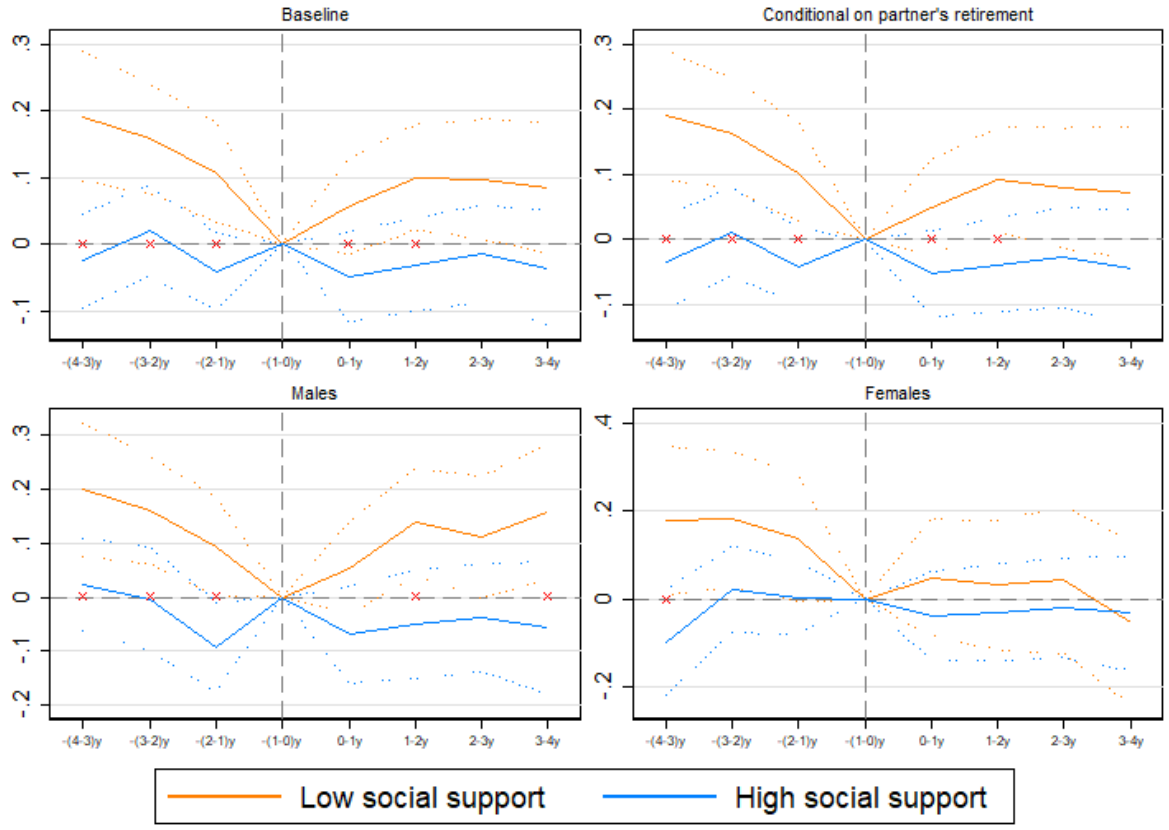


Figure 2: Fixed effects estimates – time since retirement on social support for coupled retirees



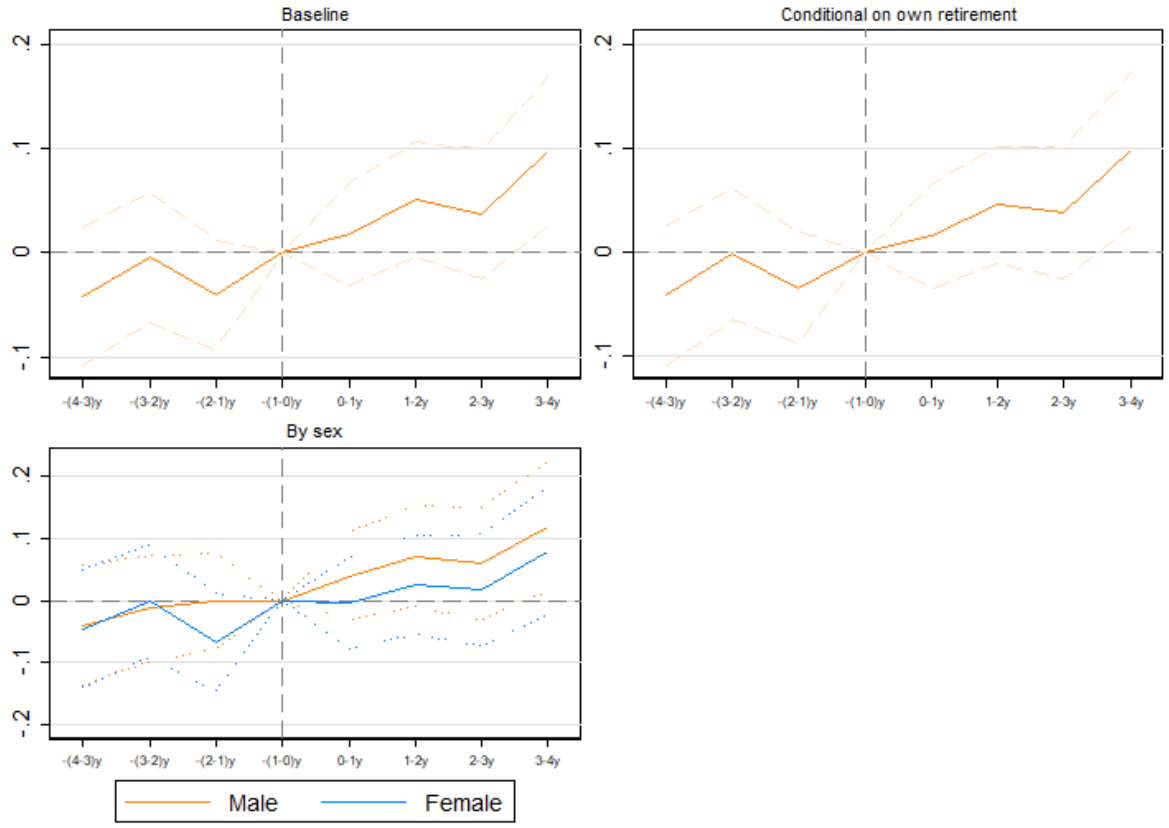
Notes: Estimates are from linear fixed effects regressions. The dependent variable is the social support index score (standardized based on the mean and standard deviation of coupled retirees in the year before retirement). Additional controls are a dummy for having a long-term health condition, age group dummies (five-year groupings) and year fixed effects. 95% confidence intervals are constructed using standard errors are clustered at the couple level. Details on the number of retirees identifying each coefficient, and point estimates, are in Appendix Tables A1 and A5.

Figure 3: Fixed effects estimates – time since retirement on mental wellbeing for coupled retirees



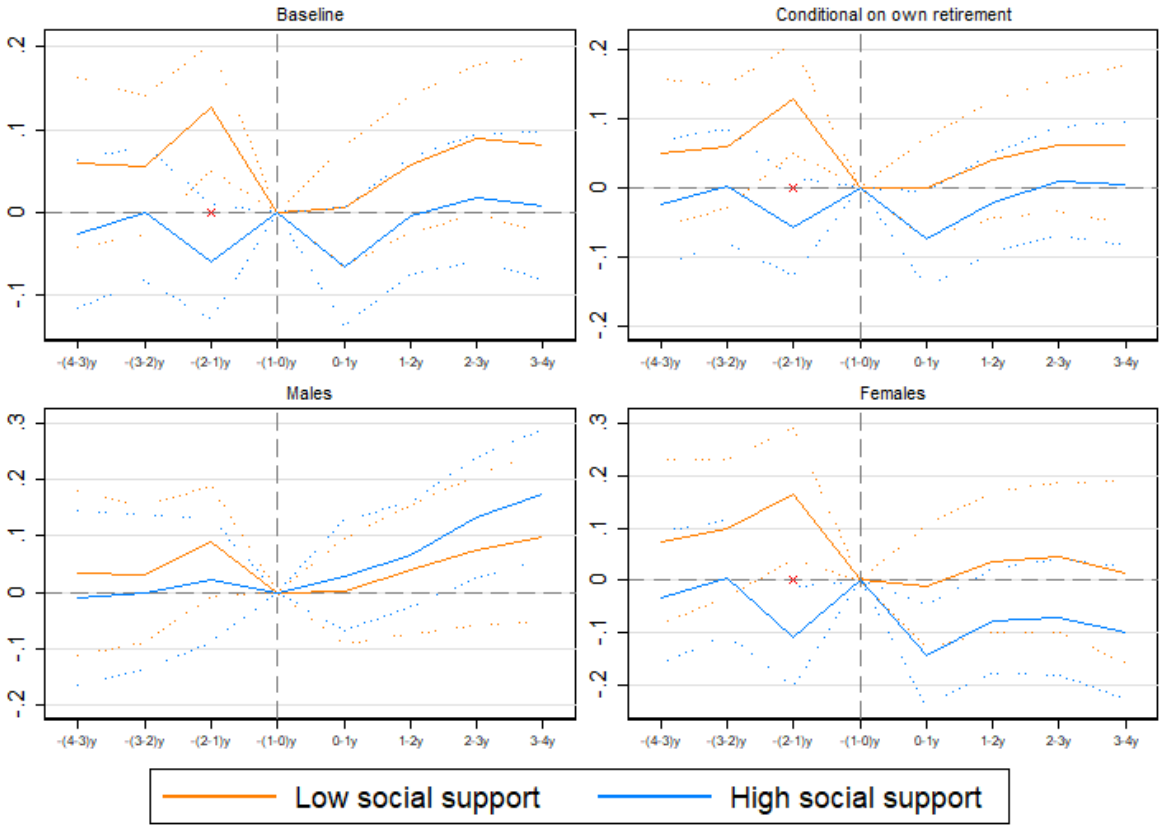
Notes: Estimates are from linear fixed effects regressions. The dependent variable is the MCS score (standardized based on the mean and standard deviation of coupled retirees in the year before retirement). Additional controls are a dummy for having a long-term health condition, age group dummies (five-year groupings) and year fixed effects. 95% confidence intervals are constructed using standard errors are clustered at the couple level. * indicates that the coefficients for the different groups are significant at the 5% level. Details on the number of retirees identifying each coefficient, and point estimates, are in Appendix Tables A2 and A5.

Figure 4: Fixed effects estimates – time since spouse's retirement on social support for coupled retirees



Notes: Estimates are from linear fixed effects regressions. The dependent variable is the social support index score (standardized based on the mean and standard deviation of coupled retirees in the year before retirement). Additional controls are a dummy for having a long-term health condition, age group dummies (five-year groupings) and year fixed effects. 95% confidence intervals are constructed using standard errors are clustered at the couple level. Details on the number of retirees identifying each coefficient, and point estimates, are in Appendix Tables A3 and A5.

Figure 5: Fixed effects estimates – time since spouse's retirement on mental wellbeing for coupled retirees



Notes: Estimates are from linear fixed effects regressions. The dependent variable is the MCS score (standardized based on the mean and standard deviation of coupled retirees in the year before retirement). Additional controls are a dummy for having a long-term health condition, age group dummies (five-year groupings) and year fixed effects. 95% confidence intervals are constructed using standard errors are clustered at the couple level. * indicates that the coefficients for the different groups are significant at the 5% level. Details on the number of retirees identifying each coefficient, and point estimates, are in Appendix Tables A4 and A5.

Table 1: Age Pension age thresholds in Australia

	Pension age	
Date	Females	Males
1/07/1995	60.0	65.0
1/07/1997	60.5	65.0
1/07/1999	61.0	65.0
1/07/2001	61.5	65.0
1/07/2003	62.0	65.0
1/07/2005	62.5	65.0
1/07/2007	63.0	65.0
1/07/2009	63.5	65.0
1/07/2011	64.0	65.0
1/07/2013	64.5	65.0
1/07/2015	65.0	65.0
1/07/2017	65.5	65.5
1/07/2019	66.0	66.0
1/07/2021	66.5	66.5
1/07/2023	67.0	67.0

Table 2: IV regression results – females

					Low social support		High social support	
	FE	FE-IV	FE	FE-IV	FE	FE-IV	FE	FE-IV
	Social support	Social support	MCS	MCS	MCS	MCS	MCS	MCS
				Own retirement				
Retired	0.021	0.283	0.023	0.551***	0.008	0.657*	0.027	0.503**
	(0.016)	(0.192)	(0.015)	(0.201)	(0.028)	(0.364)	(0.018)	(0.227)
Eligibility (first stage)		0.093***		0.092***		0.090***		0.092***
		(0.012)		(0.012)		(0.019)		(0.015)
F-stat		55.73		56.16		22.19		37.10
N	26852	26852	27770	27770	10963	10963	16807	16807
Groups	3888	3888	3922	3922	2717	2717	3165	3165
				Spouse's retirement				
Spouse retired	0.024	0.069	-0.001	0.081	-0.002	0.614*	-0.016	-0.062
	(0.019)	(0.154)	(0.020)	(0.148)	(0.041)	(0.316)	(0.021)	(0.175)
Eligibility (first stage)		0.129***		0.130***		0.133***		0.125***
		(0.015)		(0.015)		(0.024)		(0.018)
F-stat		70.60		72.51		30.69		47.77
N	17108	17108	17532	17532	6438	6438	11094	11094
Groups	2389	2389	2412	2412	1570	1570	1984	1984

Note: FE estimates are based on linear fixed effects regression. FE-IV are fixed effects instrumental variables regression results using Age Pension eligibility as an instrument. Dependent variables are standardized based on the mean and standard deviation of retirees in the year before retirement. Additional controls are a dummy for having a long-term health condition, a quadratic in age (measured in years-months), state dummies, separate controls for number of dependent children aged: 0-4 years; 5-9 years; 10-14 years; and 15-24 years, dummies for marital status (married, defacto, single, widowed, divorced, separated) and year fixed effects. Results for spouse's retirement also include a quadratic in spouse's age as additional controls. Standard errors (in parentheses) are clustered at the couple level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 3: IV regression results – males

					Low social support		High social support	
	FE	FE-IV	FE	FE-IV	FE	FE-IV	FE	FE-IV
	Social support	Social support	MCS	MCS	MCS	MCS	MCS	MCS
				Own retirement				
Retired	0.005	0.149	-0.016	0.229*	-0.049**	0.173	0.014	0.110
	(0.016)	(0.138)	(0.015)	(0.133)	(0.025)	(0.189)	(0.017)	(0.168)
Eligibility (first stage)		0.125***		0.125***		0.137***		0.115***
		(0.013)		(0.013)		(0.018)		(0.017)
F-stat		93.67		96.64		57.29		46.67
N	23654	23654	24214	24214	11790	11790	12424	12424
Groups	3511	3511	3537	3537	2712	2712	2587	2587
				Spouse's retirement				
Spouse retired	0.020	0.128	0.037**	0.333	0.043	0.069	0.030	0.198
	(0.020)	(0.281)	(0.019)	(0.289)	(0.032)	(0.399)	(0.022)	(0.380)
Eligibility (first stage)		0.074***		0.071***		0.083***		0.059***
		(0.016)		(0.016)		(0.023)		(0.020)
F-stat		21.66		20.40		12.99		8.81
N	15687	15687	16045	16045	7143	7143	8902	8902
Groups	2180	2180	2190	2190	1597	1597	1713	1713

Notes: See Table 2.

*Online Appendix

Appendix A – Main results tables

Table A1: Fixed effects estimates – time since retirement on social support for coupled retirees

	(1)	(2)	(3)	(4)
-(4-3)y	-0.054	-0.056	-0.017	-0.112**
	(0.034)	(0.034)	(0.042)	(0.056)
-(3-2)y	-0.011	-0.015	0.006	-0.040
	(0.029)	(0.029)	(0.037)	(0.044)
-(2-1)y	-0.043*	-0.039	-0.070**	0.006
	(0.025)	(0.025)	(0.032)	(0.039)
0-1y	0.005	-0.000	-0.021	0.021
	(0.023)	(0.024)	(0.030)	(0.037)
1-2y	-0.004	-0.017	-0.047	0.012
	(0.028)	(0.028)	(0.037)	(0.042)
2-3y	0.006	0.001	-0.048	0.065
	(0.029)	(0.030)	(0.040)	(0.046)
3-4y	-0.002	-0.016	-0.039	0.001
	(0.034)	(0.035)	(0.046)	(0.053)
Spouse's retirement ?	No	Yes	Yes	Yes
Sample	All	All	Males	Females
N	9369	9369	5188	4182
R_2 (within)	0.007	0.008	0.013	0.016
Couples	1559	1559	857	702

Notes: Estimates are from linear fixed effects regressions. The dependent variable is the social support index score (standardized based on the mean and standard deviation of coupled retirees in the year before retirement). Additional controls are a dummy for having a long-term health condition, age group dummies (five-year groupings) and year fixed effects. Standard errors (in parentheses) are clustered at the couple level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A2: Fixed effects estimates – time since retirement on mental wellbeing for coupled retirees

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
-(4-3)y	0.191***	-0.025	0.191***	-0.035	0.198***	0.024	0.178**	-0.100
	(0.049)	(0.036)	(0.050)	(0.036)	(0.063)	(0.043)	(0.086)	(0.062)
-(3-2)y	0.158***	0.020	0.163***	0.012	0.161***	-0.004	0.181**	0.022
	(0.042)	(0.035)	(0.043)	(0.035)	(0.051)	(0.049)	(0.078)	(0.050)
-(2-1)y	0.108***	-0.042	0.103***	-0.042	0.094**	-0.092**	0.136*	0.002
	(0.038)	(0.030)	(0.039)	(0.030)	(0.047)	(0.042)	(0.073)	(0.042)
0-1y	0.056	-0.049	0.049	-0.052	0.052	-0.070	0.049	-0.039
	(0.037)	(0.034)	(0.037)	(0.034)	(0.043)	(0.045)	(0.067)	(0.051)
1-2y	0.100**	-0.031	0.092**	-0.038	0.137***	-0.051	0.032	-0.029
	(0.040)	(0.036)	(0.041)	(0.037)	(0.051)	(0.051)	(0.075)	(0.056)
2-3y	0.098**	-0.015	0.079*	-0.028	0.110*	-0.038	0.043	-0.020
	(0.046)	(0.037)	(0.047)	(0.039)	(0.057)	(0.050)	(0.085)	(0.058)
3-4y	0.084*	-0.036	0.072	-0.043	0.156**	-0.057	-0.055	-0.032
	(0.051)	(0.044)	(0.052)	(0.046)	(0.064)	(0.062)	(0.095)	(0.066)
Spouse's retirement?	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Sample	All	All	All	All	Males	Males	Females	Females
Social support	Low	High	Low	High	Low	High	Low	High
N	4261	4419	4261	4419	2662	2156	1599	2263
R_2 (within)	0.020	0.017	0.022	0.019	0.031	0.024	0.031	0.029
Couples	660	659	660	659	406	321	254	338

Notes: Estimates are from linear fixed effects regressions. The dependent variable is the MCS score (standardized based on the mean and standard deviation of coupled retirees in the year before retirement). Additional controls are a dummy for having a long-term health condition, age group dummies (five-year groupings) and year fixed effects. Standard errors (in parentheses) are clustered at the couple level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A3: Fixed effects estimates – time since spouse's retirement on social support for coupled retirees

	(1)	(2)	(3)	(4)
-(4-3)y	-0.042	-0.041	-0.040	-0.045
	(0.034)	(0.034)	(0.049)	(0.048)
-(3-2)y	-0.004	-0.002	-0.013	-0.000
	(0.032)	(0.032)	(0.043)	(0.046)
-(2-1)y	-0.040	-0.034	-0.001	-0.067*
	(0.027)	(0.027)	(0.039)	(0.040)
0-1y	0.017	0.015	0.039	-0.005
	(0.025)	(0.026)	(0.036)	(0.037)
1-2y	0.051*	0.046	0.071*	0.025
	(0.028)	(0.029)	(0.041)	(0.040)
2-3y	0.037	0.037	0.060	0.017
	(0.032)	(0.032)	(0.046)	(0.046)
3-4y	0.097***	0.098***	0.119**	0.080
	(0.036)	(0.037)	(0.053)	(0.052)
Own retirement?	No	Yes	Yes	Yes
Sample	All	All	Males	Females
N	7713	7713	3560	4153
R_2 (within)	0.009	0.009	0.013	0.017
Couples	1263	1263	589	674

Notes: Estimates are from linear fixed effects regressions. The dependent variable is the social support index score (standardized based on the mean and standard deviation of coupled retirees in the year before retirement). Additional controls are a dummy for having a long-term health condition, age group dummies (five-year groupings) and year fixed effects. Standard errors (in parentheses) are clustered at the couple level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A4: Fixed effects estimates – time since spouse's retirement on mental wellbeing for coupled retirees

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
-(4-3)y	0.060	-0.026	0.049	-0.023	0.035	-0.009	0.073	-0.034
	(0.052)	(0.045)	(0.055)	(0.046)	(0.074)	(0.078)	(0.080)	(0.064)
-(3-2)y	0.056	-0.001	0.059	0.003	0.032	0.000	0.100	0.006
	(0.043)	(0.042)	(0.045)	(0.042)	(0.061)	(0.070)	(0.067)	(0.056)
-(2-1)y	0.127***	-0.060*	0.128***	-0.057	0.091*	0.022	0.165**	-0.108**
	(0.039)	(0.035)	(0.040)	(0.036)	(0.050)	(0.055)	(0.064)	(0.049)
0-1y	0.006	-0.066*	-0.001	-0.075**	0.002	0.030	-0.012	-0.143***
	(0.037)	(0.037)	(0.037)	(0.035)	(0.047)	(0.050)	(0.059)	(0.049)
1-2y	0.058	-0.005	0.040	-0.022	0.040	0.068	0.035	-0.077
	(0.042)	(0.036)	(0.043)	(0.036)	(0.058)	(0.047)	(0.068)	(0.051)
2-3y	0.088*	0.018	0.061	0.009	0.075	0.132**	0.044	-0.070
	(0.046)	(0.039)	(0.049)	(0.040)	(0.068)	(0.054)	(0.073)	(0.056)
3-4y	0.082	0.008	0.062	0.005	0.098	0.173***	0.015	-0.100
	(0.054)	(0.045)	(0.058)	(0.045)	(0.076)	(0.059)	(0.088)	(0.064)
Own retirement?	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Sample	All	All	All	All	Males	Males	Females	Females
Social support	Low	High	Low	High	Low	High	Low	High
N	3602	3585	3602	3585	1893	1391	1709	2194
R_2 (within)	0.017	0.020	0.020	0.022	0.033	0.035	0.031	0.031
Couples	547	536	547	536	289	209	258	327

Notes: Estimates are from linear fixed effects regressions. The dependent variable is the MCS score (standardized based on the mean and standard deviation of coupled retirees in the year before retirement). Additional controls are a dummy for having a long-term health condition, age group dummies (five-year groupings) and year fixed effects. Standard errors (in parentheses) are clustered at the couple level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A5: Observations per event date dummy for each main results table

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
				Table A1				
-(4-3)y	920	920	515	405				
-(3-2)y	1,032	1,032	578	454				
-(2-1)y	1,143	1,143	636	507				
-(1-0)y	1,319	1,319	727	592				
0-1y	1,484	1,484	818	666				
1-2y	1,275	1,275	701	574				
2-3y	1,157	1,157	639	518				
3-4y	1,039	1,039	574	465				
				Table A2				
-(4-3)y	426	468	426	468	274	235	152	233
-(3-2)y	473	519	473	519	300	254	173	265
-(2-1)y	536	577	536	577	335	284	201	293
-(1-0)y	657	655	657	655	405	320	252	335
0-1y	645	651	645	651	398	318	247	333
1-2y	570	564	570	564	352	272	218	292
2-3y	503	518	503	518	314	250	189	268
3-4y	451	467	451	467	284	223	167	244
				Table A3				
-(4-3)y	770	770	352	418				
-(3-2)y	855	855	391	464				
-(2-1)y	954	954	435	519				
-(1-0)y	1,083	1,083	498	585				
0-1y	1,194	1,194	555	639				
1-2y	1,051	1,051	495	556				
2-3y	946	946	435	511				
3-4y	860	860	399	461				
				Table A4				
-(4-3)y	371	373	371	373	193	142	178	231
-(3-2)y	412	408	412	408	216	158	196	250
-(2-1)y	458	472	458	472	243	179	215	293
-(1-0)y	547	533	547	533	289	208	258	325
0-1y	536	527	536	527	283	206	253	321
1-2y	476	460	476	460	252	182	224	278
2-3y	420	425	420	425	217	167	203	258
3-4y	382	387	382	387	200	149	182	238

Appendix B – Additional Event Study Results

Figure B1: Fixed effects estimates – time since retirement on social support for coupled retirees (people with multiple retirements dropped)

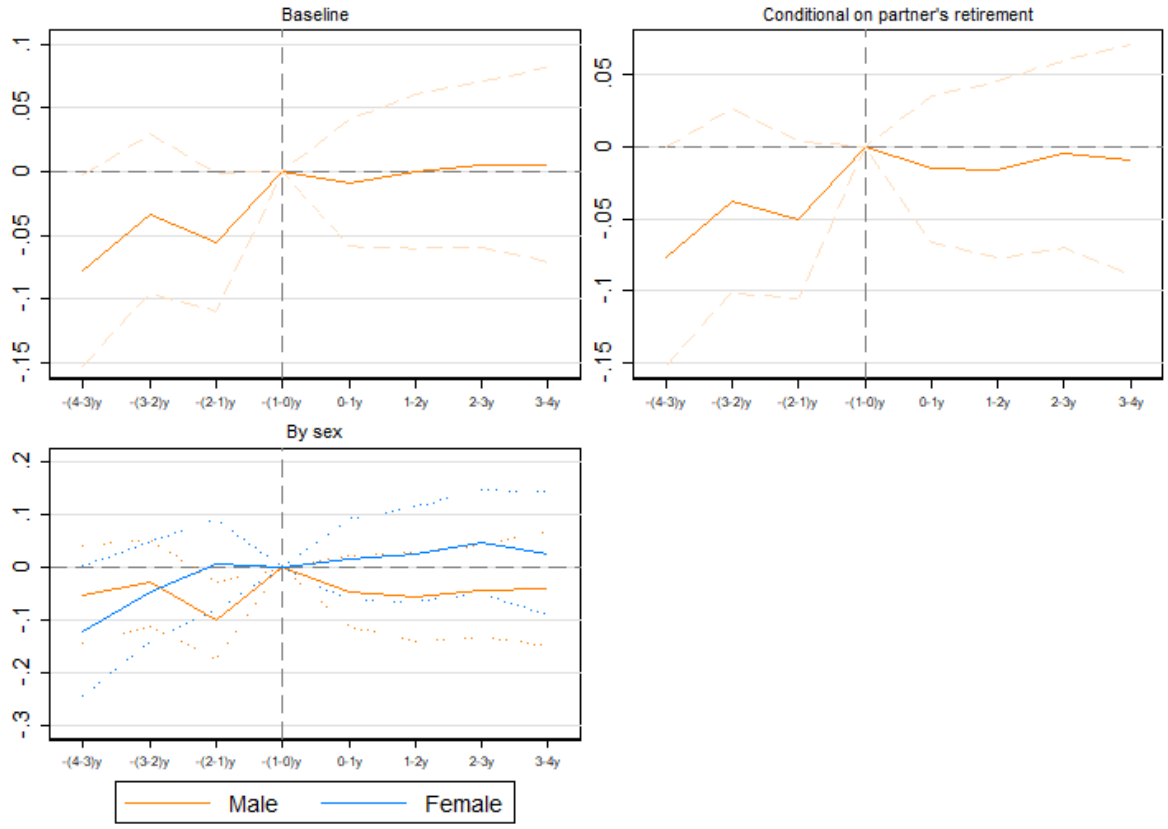


Figure B2: Fixed effects estimates – time since retirement on mental wellbeing for coupled retirees (people with multiple retirements dropped)

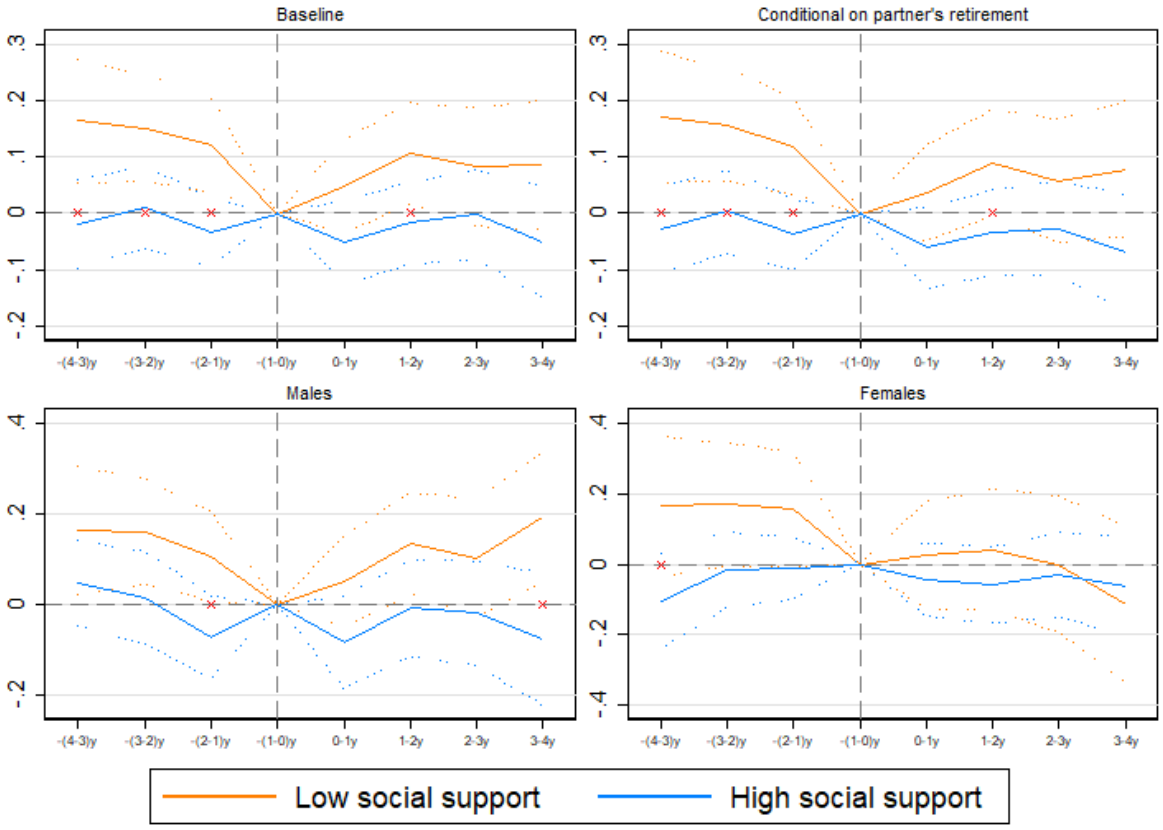


Figure B3: Fixed effects estimates – time since spouse's retirement on social support for coupled retirees (people with multiple spousal retirements dropped)

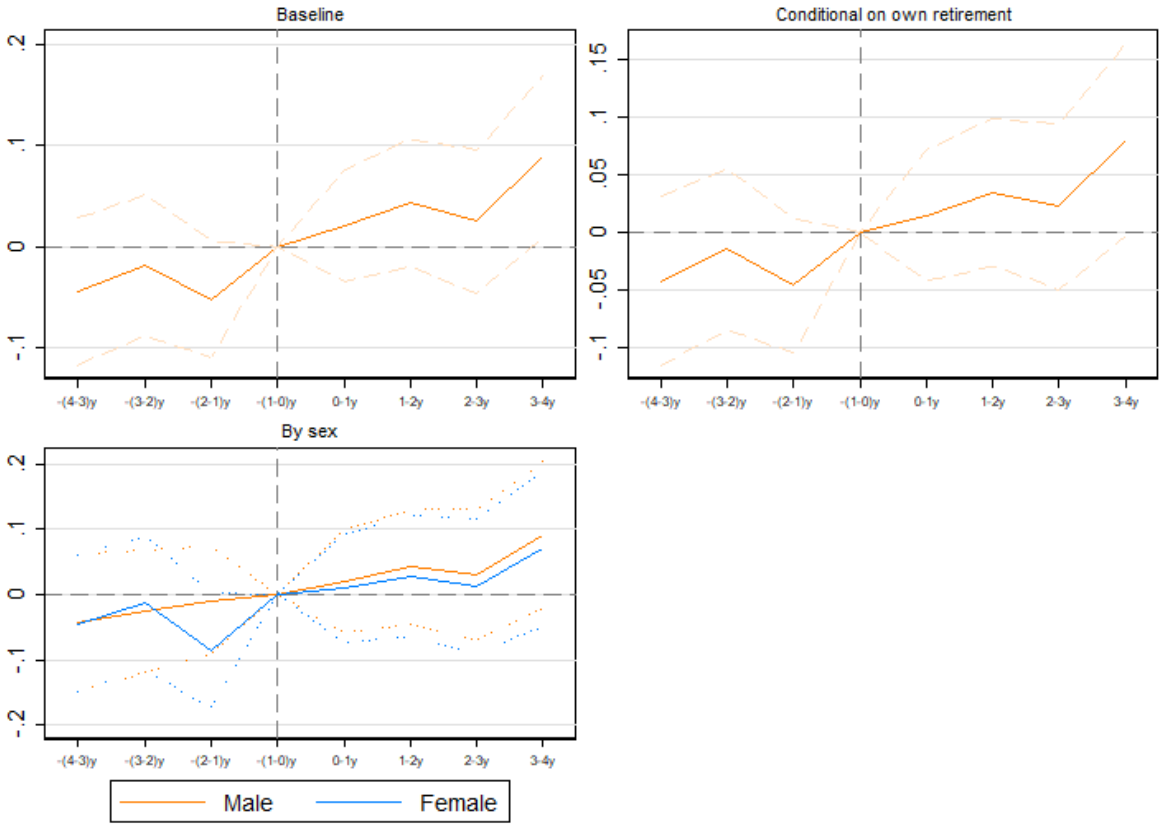


Figure B4: Fixed effects estimates – time since spouse's retirement on mental wellbeing for coupled retirees (people with multiple spousal retirements dropped)

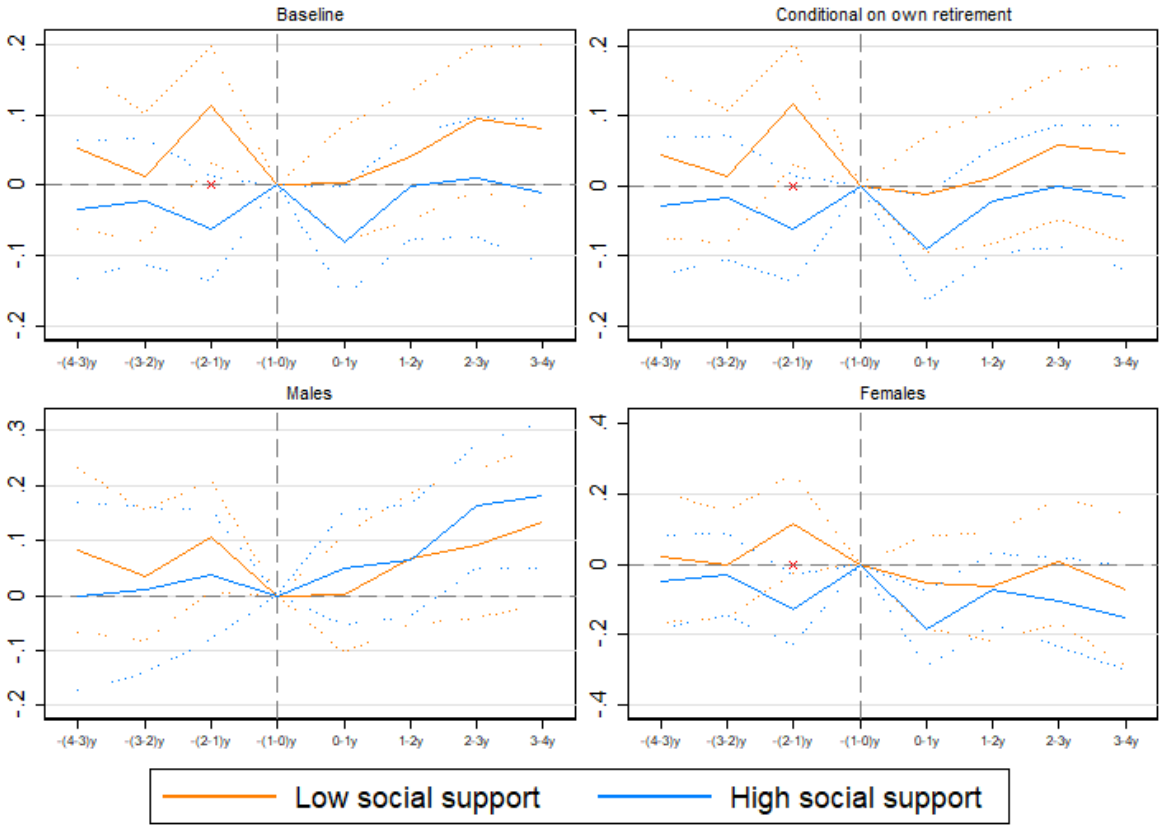


Figure B5: Fixed effects estimates – time since retirement on social support for single retirees

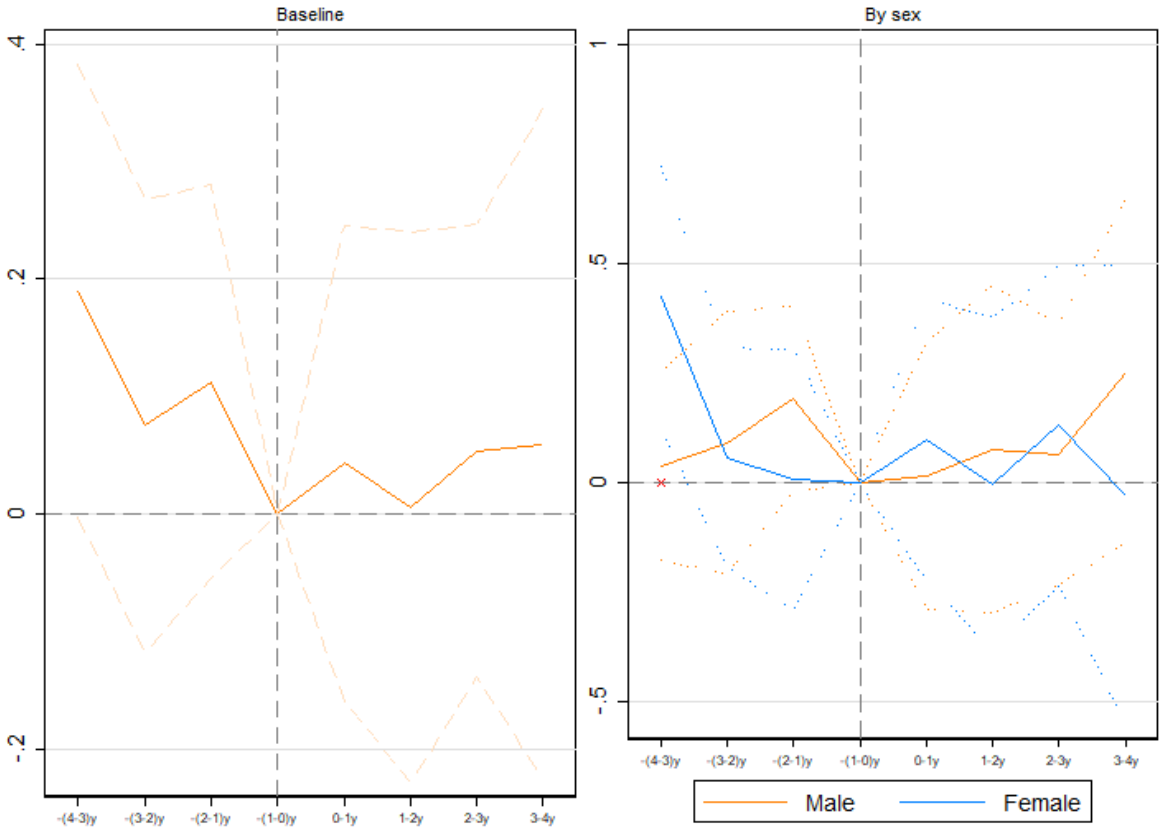


Figure B6: Fixed effects estimates – time since retirement on mental wellbeing for single retirees

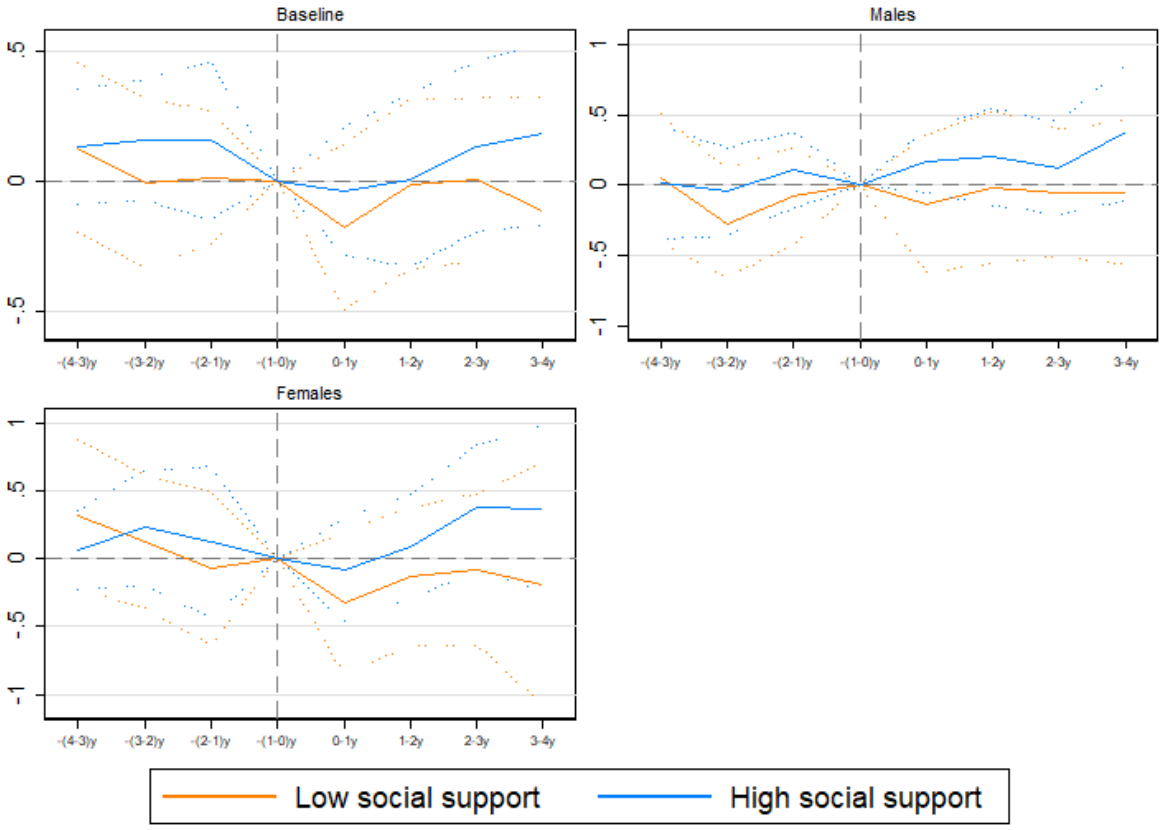


Figure B7: Fixed effects estimates – time since retirement on social support for separated, divorced, or widowed retirees

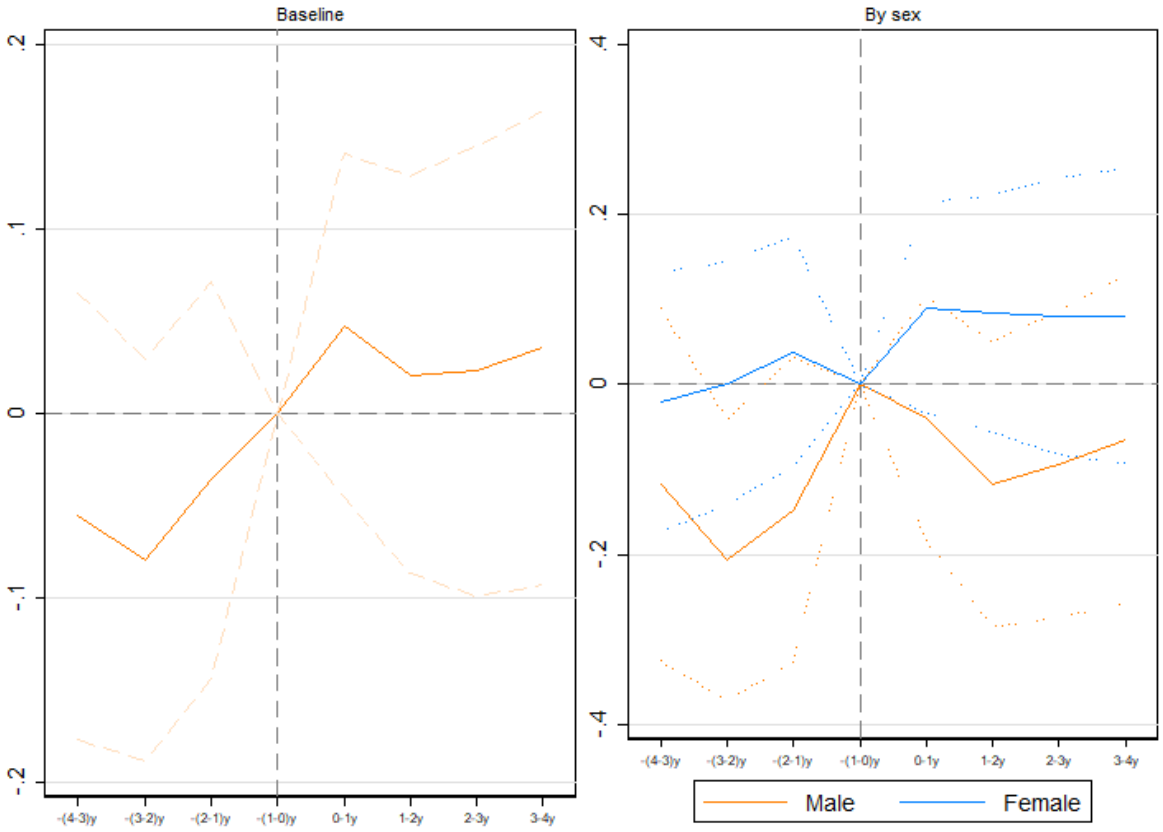


Figure B8: Fixed effects estimates – time since retirement on mental wellbeing for separated, divorced, or widowed retirees

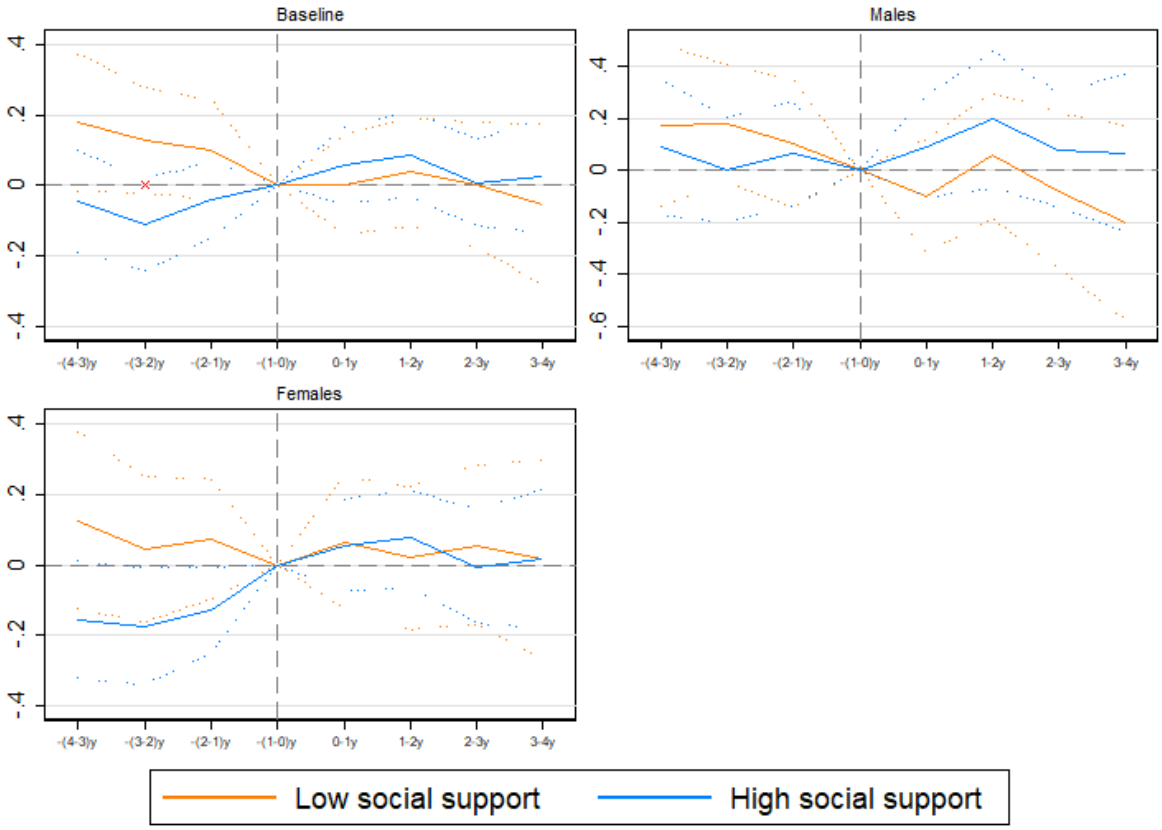


Figure B9: Fixed effects estimates – time since retirement on social support for coupled retirees (alternative retirement variable)

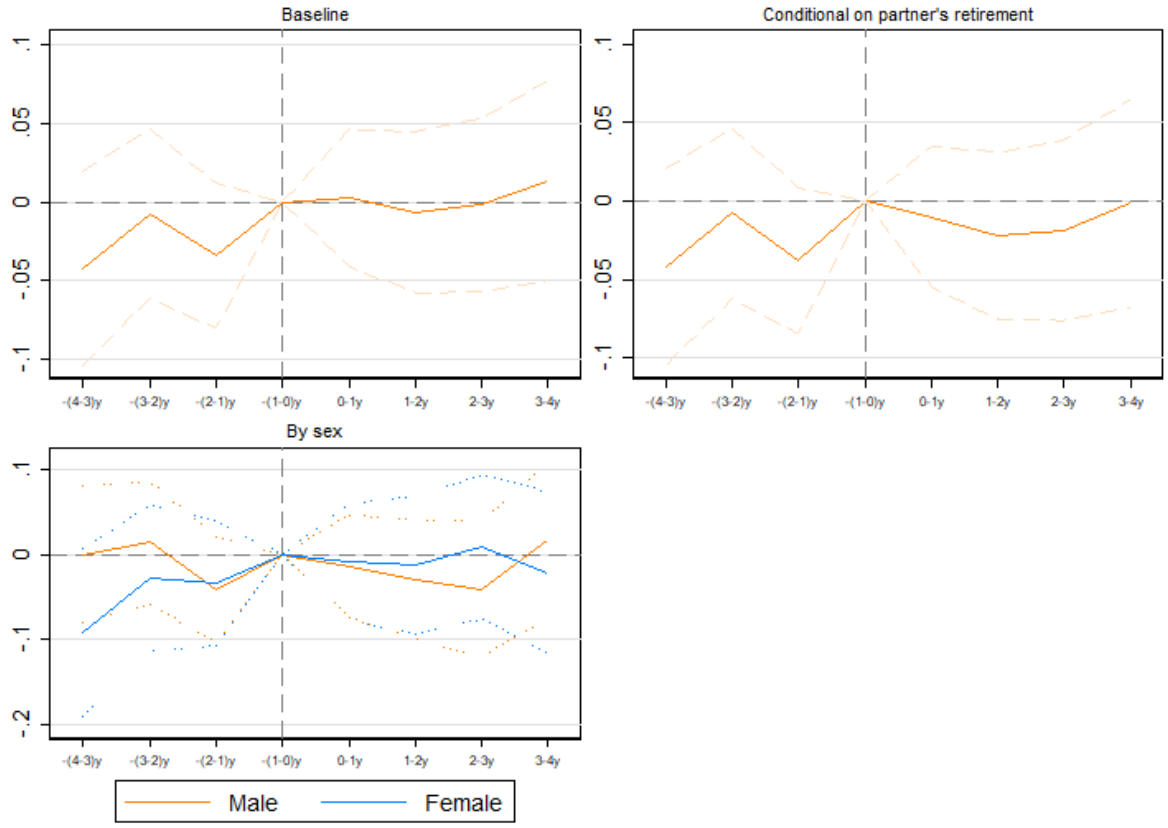


Figure B10: Fixed effects estimates – time since retirement on mental wellbeing for coupled retirees (alternative retirement variable)

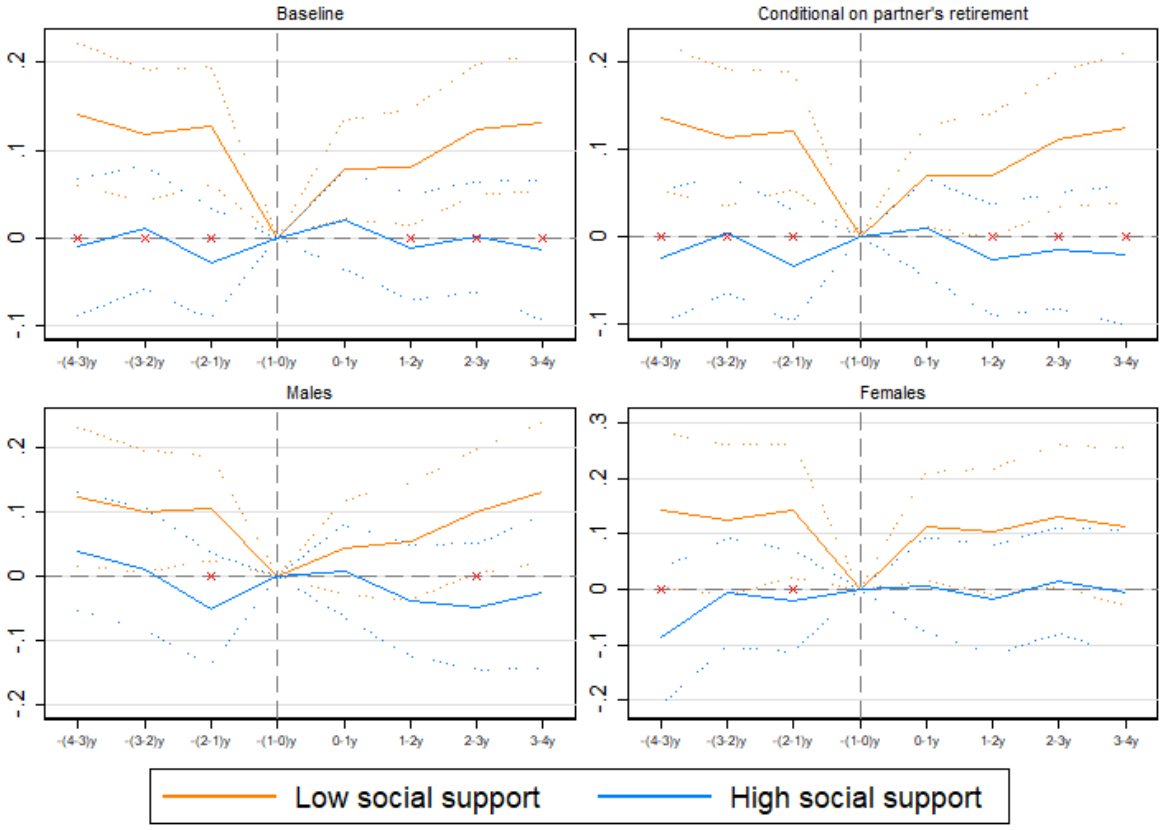


Figure B11: Fixed effects estimates – time since spouse's retirement on social support for coupled retirees (alternative retirement variable)

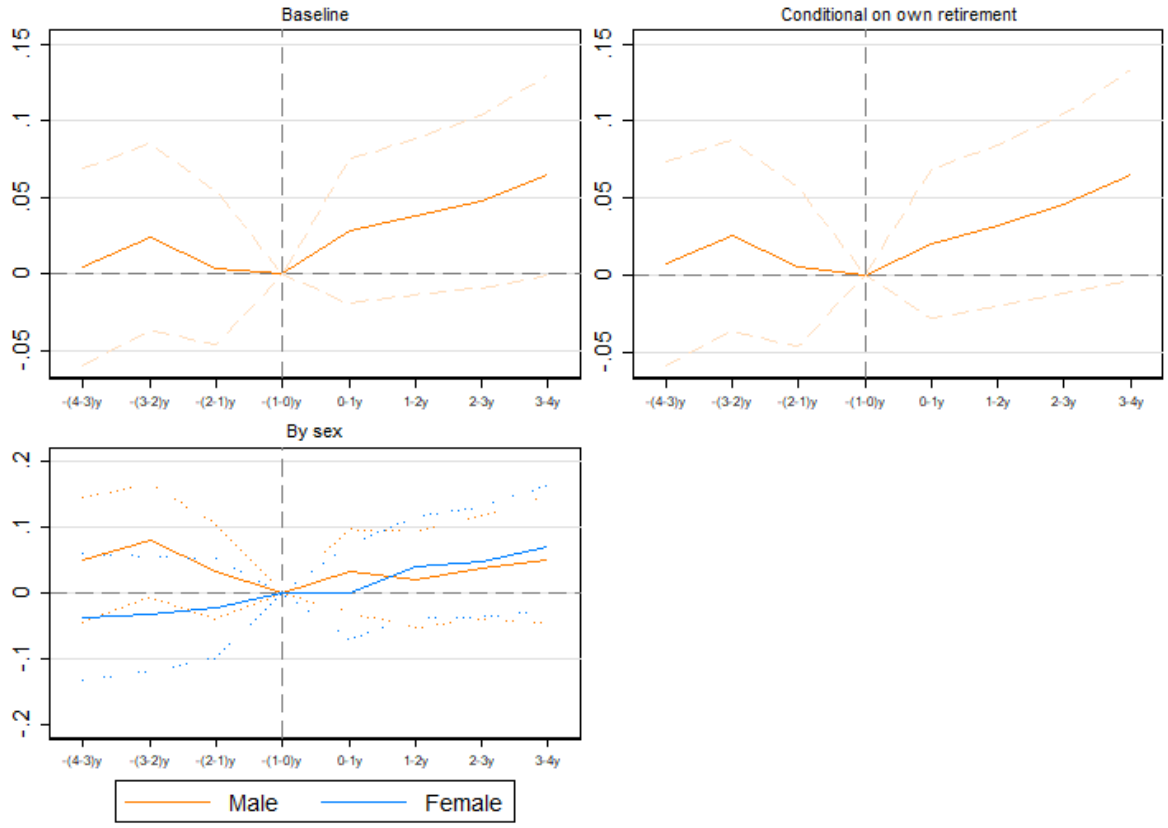


Figure B12: Fixed effects estimates – time since spouse's retirement on mental wellbeing for coupled retirees (alternative retirement variable)

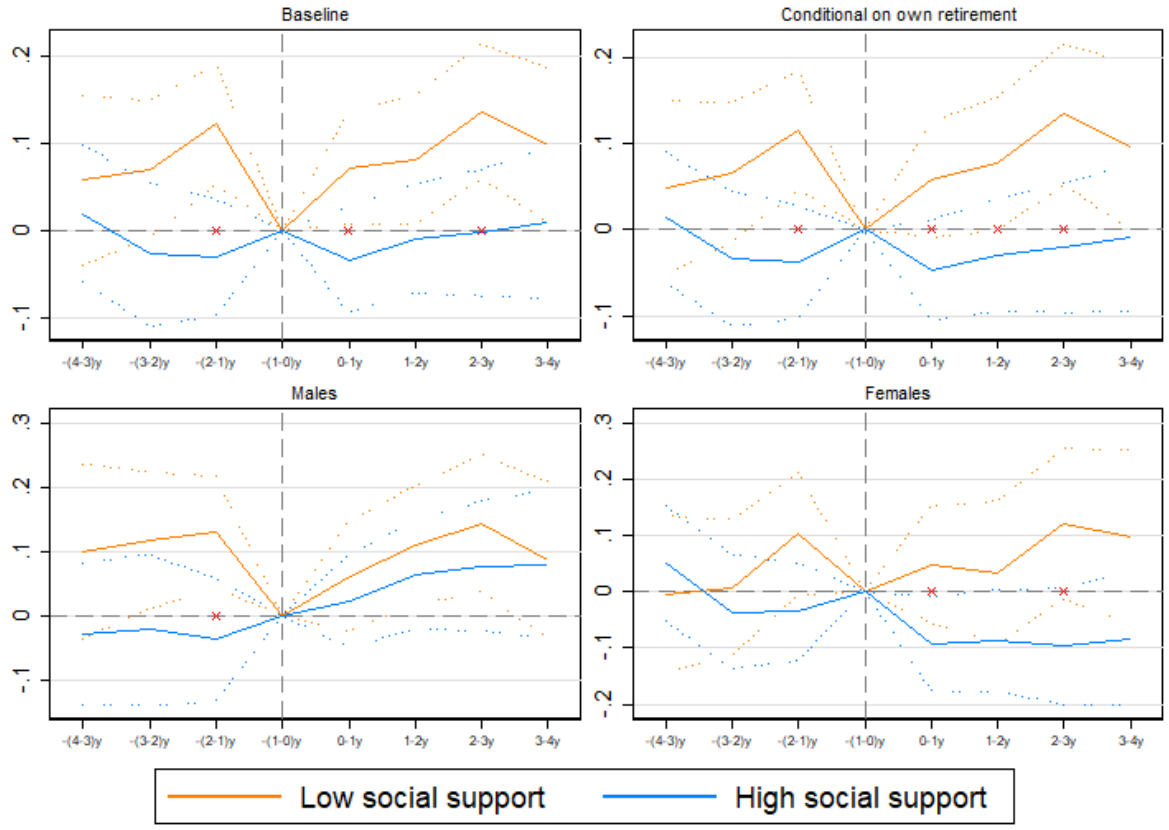


Figure B13: Fixed effects estimates – time since retirement on life satisfaction for coupled retirees

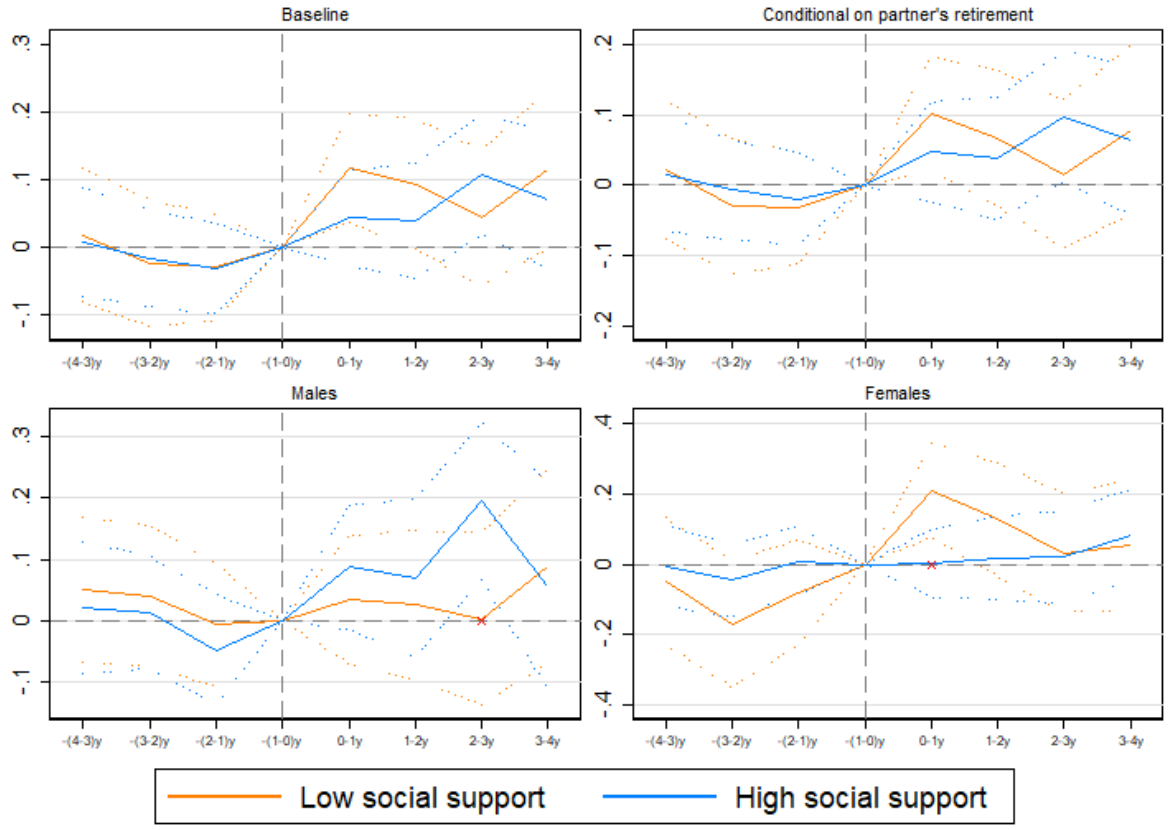
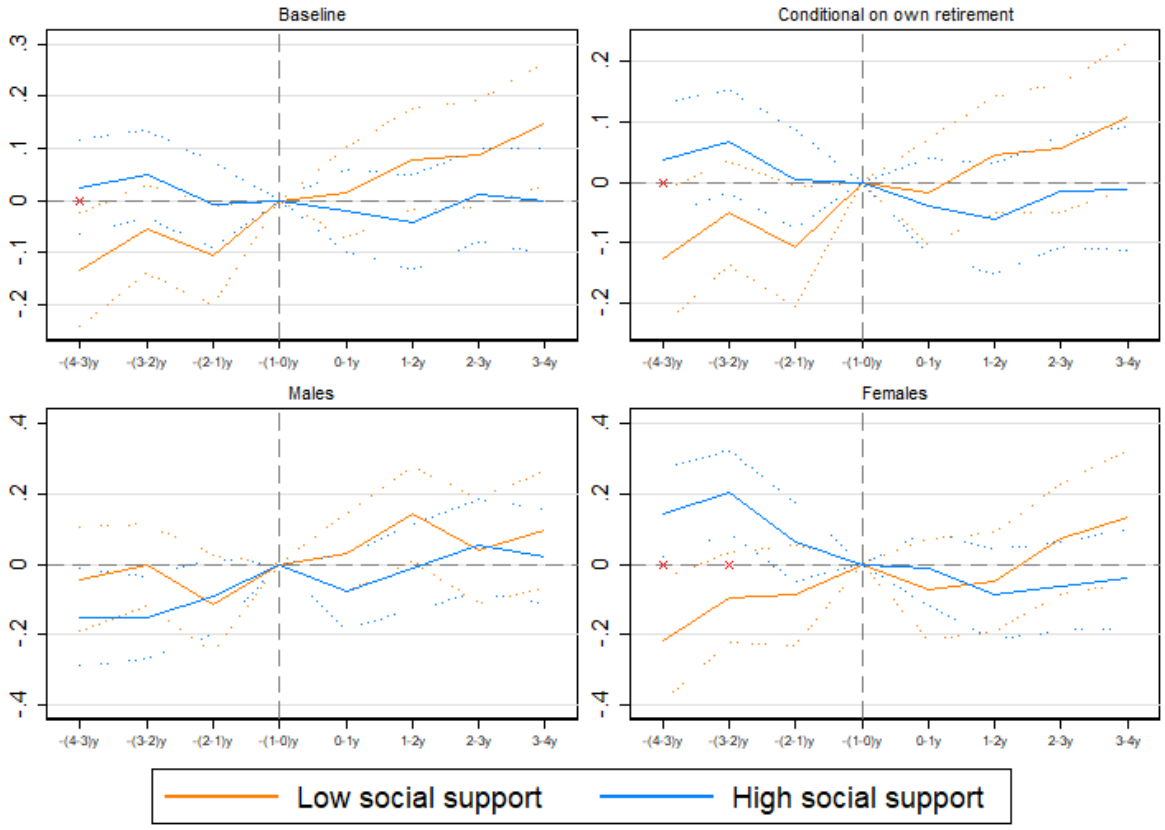


Figure B14: Fixed effects estimates – time since spouse's retirement on life satisfaction for coupled retirees



Appendix C – Additional IV estimates

Table C1: Additional IV estimates for females

					Low social support		High social support	
	FE	FE-IV	FE	FE-IV	FE	FE-IV	FE	FE-IV
	Social support	Social support	MCS	MCS	MCS	MCS	MCS	MCS
	A. Baseline							
Retired	0.021	0.283	0.023	0.551***	0.008	0.657*	0.027	0.503**
	(0.016)	(0.192)	(0.015)	(0.201)	(0.028)	(0.364)	(0.018)	(0.227)
Spouse retired	0.024	0.069	-0.001	0.081	-0.002	0.614*	-0.016	-0.062
	(0.019)	(0.154)	(0.020)	(0.148)	(0.041)	(0.316)	(0.021)	(0.175)
	B. Retirement defined as non-labor for participation							
Retired	0.044**	0.313	-0.028	0.613***	-0.057*	0.774*	-0.007	0.523**
	(0.017)	(0.204)	(0.017)	(0.218)	(0.031)	(0.413)	(0.019)	(0.239)
Spouse retired	0.013	0.089	-0.018	0.081	-0.010	0.718**	-0.036*	-0.063
	(0.019)	(0.159)	(0.019)	(0.152)	(0.039)	(0.363)	(0.021)	(0.171)
	C. Controlling for total disposable annual household income (cubic, equivalized, inclusive imputed values)							
Retired	0.021	0.285	0.023	0.545***	0.009	0.669*	0.027	0.495**
	(0.016)	(0.190)	(0.015)	(0.199)	(0.028)	(0.369)	(0.018)	(0.223)
Spouse retired	0.023	0.071	0.000	0.080	0.002	0.619**	-0.016	-0.066
	(0.019)	(0.156)	(0.019)	(0.150)	(0.040)	(0.315)	(0.021)	(0.178)
	D. Replace MCS with life satisfaction (standardized in same way)							
Retired			0.033*	0.631***	0.023	0.729*	0.041**	0.558**
			(0.017)	(0.233)	(0.031)	(0.441)	(0.019)	(0.260)
Spouse retired			0.017	0.288*	-0.061	0.719**	0.049**	0.106
			(0.019)	(0.156)	(0.044)	(0.348)	(0.020)	(0.174)

Notes: See Table 2.

Table C2: Additional IV estimates for males

					Low social support		High social support	
	FE	FE-IV	FE	FE-IV	FE	FE-IV	FE	FE-IV
	Social support	Social support	MCS	MCS	MCS	MCS	MCS	MCS
				A. Baseline				
Retired	0.005	0.149	-0.016	0.229*	-0.049**	0.173	0.014	0.110
	(0.016)	(0.138)	(0.015)	(0.133)	(0.025)	(0.189)	(0.017)	(0.168)
Spouse retired	0.020	0.128	0.037**	0.333	0.043	0.069	0.030	0.198
	(0.020)	(0.281)	(0.019)	(0.289)	(0.032)	(0.399)	(0.022)	(0.380)
				B. Retirement defined as non-labor for participation				
Retired	-0.003	0.150	-0.049***	0.254*	-0.094***	0.230	-0.002	0.102
	(0.016)	(0.148)	(0.016)	(0.142)	(0.028)	(0.227)	(0.017)	(0.167)
Spouse retired	0.033*	0.115	0.033*	0.320	0.039	0.031	0.029	0.222
	(0.020)	(0.272)	(0.018)	(0.284)	(0.031)	(0.381)	(0.021)	(0.435)
				C. Controlling for total disposable annual household income (cubic, equivalized, inclusive imputed values)				
Retired	0.004	0.149	-0.016	0.235*	-0.045*	0.181	0.014	0.113
	(0.016)	(0.140)	(0.015)	(0.135)	(0.025)	(0.192)	(0.017)	(0.170)
Spouse retired	0.020	0.116	0.038**	0.331	0.044	0.059	0.028	0.201
	(0.020)	(0.278)	(0.019)	(0.288)	(0.032)	(0.399)	(0.022)	(0.386)
				D. Replace MCS with life satisfaction (standardized in same way)				
Retired			0.011	0.489***	-0.009	0.410*	0.037*	0.615***
			(0.017)	(0.146)	(0.029)	(0.213)	(0.021)	(0.196)
Spouse retired			0.060***	0.827**	0.070**	1.309**	0.059**	0.232
			(0.020)	(0.337)	(0.034)	(0.532)	(0.024)	(0.433)

Notes: See Table 2.