Love and retirement – Older couples' leisure time before and after retirement

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Abstract

The paper investigates older spouses' individual and joint leisure time before and after retirement. To identify the impact of retirement on individual and joint leisure time, we use a regression discontinuity approach with the official retirement age as the instrument. The sample consists of 55-74-year-old married or cohabiting men and women and data stem from the Danish Time-Use and Consumption Survey and administrative registers at Statistics Denmark. We find that spouses' simultaneous retirement has the same impact on joint leisure time as does non-simultaneous retirement. Further, there is no impact of a partner's retirement on men and women's own leisure time. Joint and individual leisure time, however, increases when she retires, while his retirement has no impact on the couple's joint leisure time.

1   Introduction

There are several studies showing that joint retirement of spouses is not only explained by their economic opportunities after retirement, but also by their preferences for spending time together, i.e. complementarity in leisure (see e.g. Banks et al. 2010 and Stancanelli & Van Soest 2011, 2012a, 2014). That said, few studies have compared the actual time use of older men and women still active on the labor market with that of their retired counterparts. Gauthier & Smeeding (2003) find in nine European and North American countries that a substantial share of paid work is converted into passive leisure time when men and women retire and, concurrently, that the number of activities, including those partaken alone, increases with older people's age (Herzog et al. 1989, McKenna et al. 2007). Further, Stancanelli & Van Soest (2012a, 2014) find that French pensioners spend only a small amount of leisure time together with their partner, which, however, also holds for couples still active on the labor market with or without children, see e.g. Bonke (2012), Hamermesh (2002) and Hallberg (2003) for Denmark, USA and Sweden, respectively.

That people with a preference for leisure time are supposed to retire early indicates that it is not only retirement that determines leisure time, but also the preference for leisure time that explains retirement (Smith & Moen 2004). Hence, the official retirement age is used to identify the causal relationship between retirement and leisure time. In comparison, Hospido & Zamarro (2014) apply the official early retirement and normal retirement ages in various European countries to investigate the impact of the partner's retirement on own retirement from the labor market.

In accordance with Stancanelli & Van Soest (2012a, 2014), who investigated the correlation between retirement and the use of leisure time in France, we analyses the impact of both spouses' retirement on joint and individual leisure time applying the official retirement age to explain the time of retirement. However, we also use an earlier retirement age as an instrument because of the early retirement option in Denmark. The information covers 55-74-year-old Danish spouses' time use in 2008/09 (DTUC).

A summary of the Danish pension system is given in Chapter 2, and Chapter 3 explains the data sources and includes descriptive statistics. Chapter 4 shows time allocation before and after retirement, while the analyses are presented in Chapter 5. Chapter 6 concludes.

2   The Danish pension system

The Danish pension system includes three pillars: the public pensions (early retirement, official retirement, and disability pension), labor market pensions, and private pension arrangements.

The official retirement age has been 65 years since 1999, where it decreased from 67 years for those born on or after 1939. Hence, in 2008 – the year of the survey (DTUC) used in this paper – 69+-year-olds' (born before 1939) retirement age was 67 years, while it was 65 years for people younger than 69 years (born in or after 1940). From 2004 a premium was given to people postponing their retirement beyond the age of 65 years but not later than 70 years, and from 2009 until the age of 75 years. In January 2012 the official pension age increased for people born during January 1, 1954-June 30, 1960 (younger than the individuals in this sample – born 1934-53). For people born before 1954 the official retirement age is 65 years.

In 1979 pre-retirement benefit became an option for 60-year-olds born before 1954 with a working career longer than 30 years and who had contributed to this arrangement. In 1999 entitlement to the pre-retirement benefit became more stringent and in 2012 people born before 1954 could apply for this benefit at the age of 65 ½ years at the earliest and for a maximum of 5 years. For those born in or after 1963, the earliest age is 67 years and 3 years is the maximum period for receipt of this benefit.

In comparison, the French system allows people to retire as early as of 60 years of age, although the legal early retirement age was set to 62 years becoming effective in 2018, see Stancanelly & Van Soest (2012a).

The Danish public old-age retirement pension is a non-contribution system following the "pay-as-you-go" principle serving as a social safety net, which ensures a minimum living standard for all old people not on the labor market. The public old-age retirement pensions include a flat-rate payment and a means tested additional payment. The largest public pension benefit is equal to around 45 % of an average production worker's income (APW).

The Danish labor market pension system – the second pillar – is based on agreements between the unions and the employers' organizations and depends solely on their own contributions. Since 1990, every part of the Danish labor market has had labor market pensions, where the employer usually pay two thirds and the employee one third equal to 9-16 % of the gross wage.

The third pillar of the Danish pension system is private pensions with premiums paid individually by the holder of the pension. In 2008, 57 % of all 18-64-year-old men and 52 % of women had an individual private pension. These men and women had an average of 217,000 DKK and 156,000 DKK in private pensions, respectively (Amilon 2012).

For an overview of the distribution of pension savings between different groups in the Danish population see the Ministry of Economy and Internal Affairs (Ministry of Economic Affairs and the Interior 2014).

3 Data and descriptive statistics

The primary data source used here is the Danish Time-Use and Consumption Survey 2008/09 (DTUC). It consists of a randomly chosen sample drawn from the CPR register among 18-74-year-old Danes, of whom 68 % (the response rate) or 6,000 individuals participated in a telephone (CATI) or a web-based (CAPI) interview during April 2008-March 2009. Of the participants, 3,755 completed diaries for a randomly chosen ordinary weekday and weekend day, and for those who had spouses, they did the same for the same two days, see Bonke & Fallesen (2009) for a further description of DTUC.

The present study includes 55-74-year-old married/cohabiting participants who completed diaries in the DTUC. Because the spouse of the respondent can be younger or older than the respondent, an age limit of 35 years is imposed. The number of couples included is 1,166 with survey information for both the husband and the wife merged with information about income, education, etc. obtained through the administrative registers in Statistics Denmark. Information about retirement ages of early and ordinary retirees who left the labor market as employed or unemployed during 1989-2012 stems from the administrative registers.

The age band 54-74 years is used because it gives a 10-year interval around the official pension age, i.e. imposed by our discontinuity approach. However, we also do estimations with a 5-year age band to test the robustness of our analyses. Stancanelli & Van Soest (2013) also used two age bands, namely 50-70 years and 54-66 years in their study for France.

Figure 1 shows by age the number of 55-74-year-old married/cohabiting men and women who were pensioners in 2008/09. Unsurprisingly, the official pension age at 65 years implies that considerably more men of that age have retired compared with 64-year-olds, i.e. 77 and 56 %, while for women the figures were 90 and 87 %. Moreover, the opportunity to receive early pension benefits had an impact on retirement as 49 % of the 62-year-old men relatively to 24 % of the 61-year-old men had retired in 2008/09. For women the difference in the number of retirees was much smaller with 68 % at the age of 62 years and 63 % at the age of 61 years. Figure 1 also depicts that the average retirement age – half the age group had retired – was 62-63 years for men and 60-61 years for women.

Because the average ages of men and women in the sample of 55-74-year-olds were 65.6 and 63.0 years, respectively, and two-thirds had retired, it indicates that very many spouses retired at the same time, see below. However, the spouses' age differential is higher when we compare couples where the husband had retired with couples where the husband was still active

on the labor market. Conversely, if the wife had retired, the spouse's age differential was smaller than for couples where she had not yet left the labor market.

Figure 1
Share of retired men and women aged 55-74 years in 2008/09
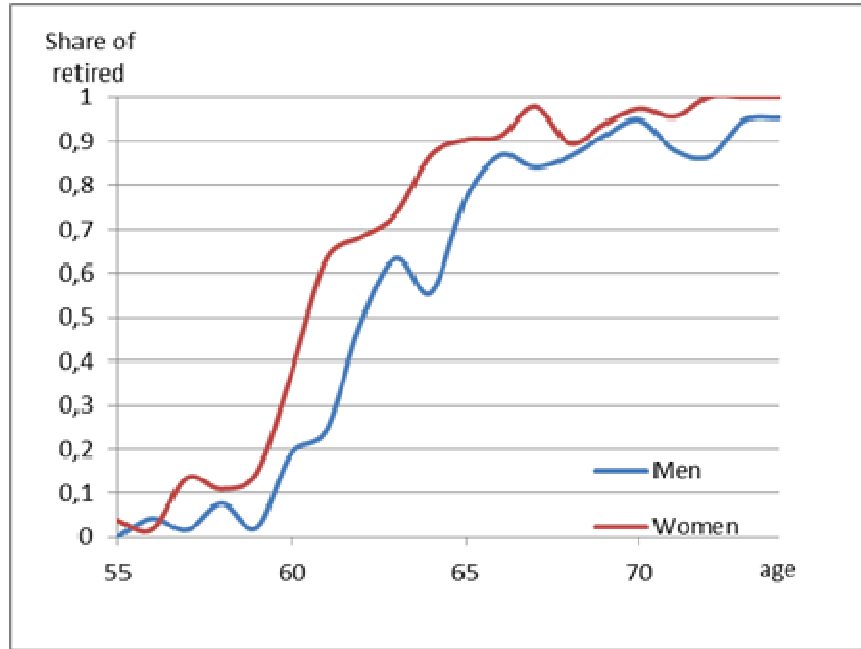
Source: Danish Time Use and Consumption Survey (DTUC)
2008-2009, own illustrations.

Regarding educational background, men and women on the labor market were more educated than retired men and women. This is not only due to a cohort effect because people with further education generally retire later than skilled and unskilled workers and those without any post-secondary education (Table 1).

There is also a significant income differential between non-retired and retired men and women. Hence, 44-83-year-old retired men's personal gross income was 56.2 % of non-retired men's, and for 41-86-year-old women the percentage was 68.6. Because of the correlation between income and retirement, income is not included in the estimation of the decision to retire – first stage, see below.

The likelihood of participating in regular leisure-time activities on a weekly basis was smaller for pensioners than for non-pensioners, which is also the case when only 60-70-year-olds are considered. We also find that retired husbands and wives' satisfaction with the amount of leisure was larger than for non-retired husbands and wives, and that husbands and wives' leisure satisfaction is the same before and after retirement.

Table 1
Descriptive statistics – Average and std. dev., 55-74-year-olds 2008/09

	Men		Women	
	Mean	Std. Dev.	Mean	Std. Dev.
Age (years)	65.63 (44-83)	6.22	62.96 (41-86)	6.26
Age (65+/-64) (share)	0.561		0.406	
Retired (share)	0.660	0.499	0.646	.478
<65 year	0.326	0.469	0.429	0.495
65+ year	0.917	0.276	0.949	0.220
Further education (share)	0.208	0.406	0.193	0.394
Employed	0.272	0.445	0.277	0.48
Retired	0.172*	0.377	0.151 *	0.358
Personal income before tax (DDK)	202.840	175.597	174.869	102.332
Employed	286.788	249.896	220.895	120.841
Retired	161.118*	88.848	151.443 *	82.210
Participates in regular leisure activities every week (share)	0.471	0.499	0.433	0.496
Employed	0.537	0.499	0.525	0.500
Retired	0.436*	0.496	0.371 *	0.483
Observations	610			556

	Men/Women			
	Mean	Std. Dev.		
Satisfaction with leisure time (ip) 1-6	5.283/5.293	0.988/1.053		
Employed	4.709/4.586	0.081/0.955		
Retired.	5.601*/5.567*	0.034/0.041		
Age differential M-W (years)	2.650			
Employed	1.797/3.570	4.480/4.919		
Retired	3.087*/2.070*	4.392/3.984		
Children	0.052	0.223		
Employed	0.110	0.313		
Retired	0.022*	0.145		
Cohabiting (share)	0.083	0.276		
Employed	0.127	0.333		
Retired	0.055*	0.229		
Renter (share)	0.217	0.413		
Employed	0.183	0.387		
Retired	0.235	0.424		
Observations	1,166			

*,**,*** significant difference relative to employed on 0.05, 0.01 and 0.001- levels,
Source: Danish Time Use and Consumption Survey (DTUC) 2008-2009, own calculations.

Because we exclude people who received disability benefit but no old-age pension, no respondents – employed or retired – reported physical or mental disabilities (not shown in table). Unsurprisingly, more men and women with children living at home were employed than retired – 11 versus 2 % – and the number of cohabiting couples was also the largest among employed people. Lastly, we find that renters retired at the same age as house owners.

3.1 Time allocation – Leisure time

Here, leisure time is defined as the time *not* spent on the labor market or on commuting, doing household work, sleeping or personal care. Hence, leisure time is spent on socializing, on other activities (e.g. reading, TV, computer, sport), and on eating. We distinguish between "leisure time A", which is when people are socializing with others, "leisure time B", which is leisure time A and engagement in other leisure activities partaken together, and "leisure time C", which is leisure time B and time spent eating, see a similar categorization in Stancanelli & Van Soest (2012a, 2014).

For all three leisure-time categories we distinguish between joint time and individual time, where joint time means that the spouses are involved in the same activity at the same time of day, and individual time means that only one spouse is involved. However, we do not know whether joint means that the spouses are actually together or do the same activity alone or with other people – there is no such distinction in the questionnaire – neither do we know whether the spouses are together doing different leisure or other activities when their time is categorized as individual leisure time. This problem also holds for most other time-use surveys, see Bonke (2012).

The problem of not knowing whether the partners participated in the same activities at the same time is because the "together-with-whom" category in the DTUC refers to family members in general not necessarily only to the partner, which is also the case for the French time-use survey (Stancanelli & Van Soest 2012a, 2014). Another problem is that this information is not reported by all respondents.

We find that all kinds of individual leisure time – leisure time A, B and C – was shorter for wives than for husbands and that the times were also shorter for employed than for retired men and women: 2 and 2 ½-3 hours for leisure time I; 4 ½ and 6-6 ½ hours for leisure time B; and 5 ½-6 and 7 ½-8 hours for leisure time C on an average day, i.e. weekdays and weekend days weighted together.

Moreover, joint leisure time (leisure time A) was also found shorter than husbands and wives' time spent individually on these activities. Where employed husbands and wives spent 34 minutes and those who were retired 52 minutes jointly, individual leisure time occupied 2 hours for those employed and nearly 3 hours for those retired (Table 2). Hence, the time spouses were involved in the same social activities (leisure A) was less than a third of the time they spent individually on such activities.

Table 2
Descriptive statistics – Leisure time before and after retirement,
55-74-year-olds 2008/09

	Hours average weekday			Men		Women	
Joint leisure time	Mean	Std. Dev.	Individual leisure time	Mean	Std. Dev.	Mean	Std. Dev.
A – Leisure	0.75	1.20	A – Leisure	2.26	2.01	2.32[a]	1.81
Employed	0.56	0.86	Employed	2.10	1.67	1.95	1.65
Retired	0.86*	1.34	Retired	2.90*	2.12	2.54[*a]	1.87
B – Leisure	3.73	2.74	B – Leisure	5.88	3.35	5.33[a]	2.96
Employed	2.83	2.21	Employed	4.82	2.92	4.33	2.58
Retired	4.17*	2.87	Retired	6.41*	3.43	5.92[*a]	3.02
C – Leisure	4.40	3.16	C – Leisure	7.22	3.69	6.76[a]	3.26
Employed	3.45	2.59	Employed	6.03	3.22	5.61	2.83
Retired	4.89*	3.32	Retired	7.83*	3.76	7.45*	3.31

[*,**,***] significant at 0.05, 0.01 and 0.001 - levels,
[a] significant relative to men at 0.05- level,
Source: Danish Time Use and Consumption Survey (DTUC) 2008-2009, own calculations.

Relative to joint leisure time A, time spent simultaneously was much longer for leisure time B and C, which is also to be expected because of the higher number of activities in the latter leisure-time categories. Hence, employed spouses spent nearly 3 hours a day jointly on leisure time B, while employed husbands spent nearly 5 hours and wives more than 4 hours individually on that leisure category. For retired husband and wives, the same time spent jointly was more than 4 hours against 6 ½ hours for husbands and 6 hours for wives spent individually. Lastly, we find that joint leisure including eating (leisure time C) occupied 3 ½ hours for those employed and nearly 5 hours for retired husbands and wives against 6 and 5 ½ hour of individual leisure C for those employed and around 7 ½ hours for retired husbands and wives, respectively.

3.2   Simultaneous retirement

The average age differential between spouses in this sample was 2.65 years, while it was 2.2 years for 50+-years-olds in a number of SHARE countries (Denmark, Sweden, Holland, Belgium, Germany, France, Austria, Switzerland, Spain, Italy and Greece) (Hospido & Zamarro 2014). The most common retirement pattern for spouses aged 55-74 years was that husbands left the labor market one year after the wife, which was the case for 18 % of the couples (Figure 2). Retirement within the same year occurred in 44 % of the couples or with an age distance of more than two years, and for 61 %, the husband retired one year earlier or three years later than did the wife. Lastly, the percentage of couples where the husband retired 2 or more years before versus 4 or more years later than his wife was about 20 % each in couples with husbands aged 55-74 years.

Figure 2
Difference in man and woman's time of retirement
years, 55-74-year-olds 2008/09

Source: Danish Time Use and Consumption Survey (DTUC) 2008-2009, own illustrations.

4   Leisure time before and after retirement

Table 3 shows that leisure time C increased significantly until the time of retirement, more for men than for women. We control for age to avoid the increase in leisure time being only because of the higher ages being closer to retirement. Where husbands' individual leisure time C increased around 45 minutes, wives' only increased nearly 30 minutes per day until both retired – for the group of 55-74-years-olds – and for the joint leisure time C the increase was nearly half an hour for husbands and around 20 minutes for wives. After retirement, husbands and wives' joint and individual leisure time C did not increase. It must be mentioned that the average distances to retirement were 5.2 years and 5.0 years for husbands and wives, respectively, and 3 years for both sexes regarding the distance from the year of retirement. Hence, the changes in time use shown in Table 3 were around these mean points of time.

Table 4 shows that the joint leisure time of couples retiring simultaneously – within one year's distance at the most – was of nearly the same length as the joint leisure time of couples where the spouses retired more than one year apart. This holds even when controlling for age differentials between the two groups (not shown in table).

Table 3
Men and women's leisure time before and after retirement – Hours per day,
OLS-regressions, 55-74-year-olds 2008/09

| | Individual leisure time | | | | Joint leisure time | | | |
| | Men | | Women | | Men | | Women | |
	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
Until retirement	.740***	.140	.428*	.174	.448***	.119	.387*	.161
After retirement	.019	.047	-.043	.036	-.023	.040	.063	.033
Age	-.066	.038	-.075*	.035	-.039	.032	.027	.032
Constant	11.048***	2.49	10.753***	2.308	6.730**	2.113	2.612	2.132
R^2	0.039		0.020		0.023		0.017	
Observations	708		531		708		531	

*,**,***significant at 0.05, 0.01 and 0.001- levels,
Source: Danish Time Use and Consumption Survey (DTUC) 2008-2009, own calculations.

Table 4
Joint leisure time and simultaneous retirement –
Hours per day, 55-74-year-olds 2008/09

| | Joint leisure time A | Joint leisure time B | Joint leisure time C |
		Hours/day (Std. Dev.)	
Simultaneous retirement (+.- 1 year difference)	0.953 (0.095)	4.336 (0.206)	5.164 (0.243)
Non-simultaneous retirement (>1 years difference)	0.840 (0.059)	4.233 (0.132)	4.920 (0.150)

Note: No significant difference between joint and non-joint retirement,
Source: Danish Time Use and Consumption Survey (DTUC) 2008-2009, own calculations.

5   The analyses

5.1   A double regression discontinuity approach

Because most Danes retire close to the official retirement age of 65, we use this information to analyze the relation between spouses' retirement and their use of individual and joint leisure time. An argument for using the official retirement age is that an increase from 65 to 67 of this official age in Germany implied that more people actually retired later (Coppola & Wilke 2014). Applying a "discontinuity-approach", as we do here, assumes that retirement is not a continuous function of age, whereas the time spent on leisure is not considered dependent on peoples' age per se. This allows for identifying the causal relation of retirement on the time spent on leisure, i.e. the outcome, see Stancanelli & Van Soest (2011, 2012a, 2012b,

2014) and Battistin et al. (2009), who use the same approach when analyzing the retirement decision among Italian people.

Because early retirement benefit in Denmark is available from the age of 62 years and this age was the average retirement age in 2008, we also use 62 years of age as an instrument in our analyses, but it does not change the results significantly for which reason only the first stage-results are shown in Table 7 in Appendix.

Formalizing the analyses, the time spent on individual leisure, L_i, is to be explained by retirement, R_i, individual factors, Z_i and some residuals, v_i (error term):

(1) $$L_i = R_i \gamma + Z_i \beta + v_i.$$

By using the official retirement age as an instrument in a two-stage-least-squares analysis, where the error term is not necessarily uncorrelated with age, the first stage has the following form:

(2) $$R_i = D_i \delta + Age_i D_i \eta + Age_i \iota + Z_i \beta + v_i.$$

where D_i is a dummy for 65+/64 years of age, and $Age_i * D_i$ an interaction term for age and the age dummy. We assume that there is no discontinuity for the Z_i variables around the age of 65 years.

For joint leisure the specification of the equation is similar with the only exception that L_j (joint leisure) is dependent on the retirement of both spouses, R_m and R_f, their different ages, Age_m and Age_f, and the interaction between age and the age dummy for the husband and the wife, respectively. Additionally, the other factors, Z_m and Z_f, are now sex-specific.

Figure 3 shows that the likelihood of retiring increased up to and also after the age of 65 years for husbands and for wives. However, there is a significant level differential between the curves around the 65-years-olds – bigger for husbands than for wives. This shows that the official age of retirement is a reasonable predictor of retirement, especially men's retirement. The same is found in other studies for European countries (Coe & Zamarro 2011, Hospido & Zamarro 2014).

To test the discontinuity of the Z covariates around the age of 65 years, we estimated the likelihood of retirement as a function of these covariates (partners' education, the relative disposable incomes of the partners, civil status, season of the year, having children living at home and homeownership) and there was still a discontinuity around that age. This was also the case when including health status, which is properly because of the correlation between educational background and health status in old age.

As mentioned in Chapter 3, we use three different measures of leisure as outcomes in the estimations assuming that an exogenous variation in the partners' retirement can be used to identify the causal effect of their retirement on their joint and individual leisure times.

Figure 3
Predicted retirement for men and women as a function
of the Z covariates, 55-74-year-olds 2008/09
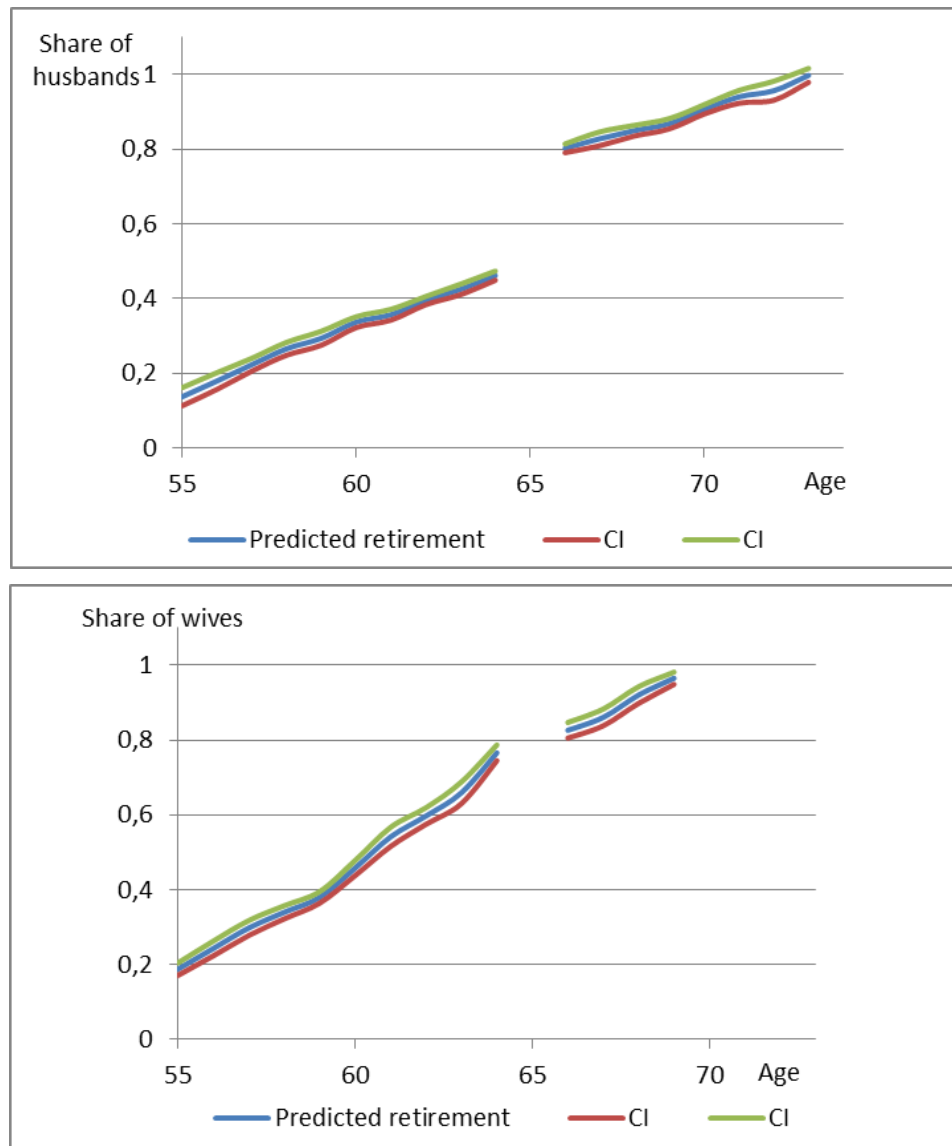
Note: CI is confidence interval at a 0.05-level,
Source: Danish Time Use and Consumption Survey (DTUC)
2008-2009, own illustrations.

5.2   Results – 1st stage

In the following we show the results of the two-stage-least-square regressions, where the likelihood of retirement around the age of 65 years – the first stage – is estimated first, and then the impact of retirement on the spouses' joint and individual leisure time – the second stage estimation.

We find that it was three to four times more likely that men and women were retired after the age of 65 years than before they reached that age – for women 3.8 and for men 3.4, when we look only at 55-74-year-olds, take their respective ages into consideration and interact their

ages with the age limit 64/65 years (Model I in Table 5). For men the differential remained even when controlling for the wife having passed the age of 64/65 years and the interaction between her age and the retirement age of 64/65 years, cf. Model II in Table 5. For women the likelihood of retirement around the age of 65 decreased – 3.8 relative to 3.0 – when controlling for the same factors as for men, cf. Model II relative to Model I. However, if we add controls for the partners' educational background, their relative income, having children, being married relative to cohabiting, and being renters – Model III – this did not impact the relationship between the official retirement age and the husband's or wife's retirement from the labor market, nor did the inclusion of health have any impact on the relationship (not shown).

Table 5
Linear likelihood model of partners' retirement at the age of 65 years –
First-stage-regression 2SLS, 55-74-year-olds 2008/09

| | Model I | | Model II | | Model III | |
	Man retired	Woman retired	Man retired	Woman retired	Man retired	Woman retired
Man 65+/<65 years	3.367 ***		3.303***	1.383***	3.451***	1.676***
	(0.361)		(0.406)	(0.398)	(0.422)	0.408
Woman 65+/<65 years		3.840***	0.685	3.013***	0.565	2.908***
		(0.378)	(0.425)	(0.417)	(0.471)	0.456
Men's age	0.059 ***		0.054***	0.011*	0.055***	.0151**
	(0.004)		(0.005)	(0.005)	0.005	0.005
Men's retirement age	-0.048 ***		-0.048***	-0.019**	-0.050***	-.0239***
	(0.006)		(0.006)	0.006	0.007	0.006
Women's age		0.067	0.014***	0.058***	0.012*	.059***
		(0.003)	(0.004)	0.004	0.004	0.004
Women's retirement age		-0.058***	-0.010	-0.045***	-0.008	-.045***
		(0.006)	(0.006)	0.006	0.007	0.007
Controls[1]	No	No	No	No	Yes	Yes
Constant	-3.226 ***	-3.541***	-3.674***	-3.688***	-3.571***	-4107***
	.267	.183		0.281	0.311	.301
Adj. R^2	0.464	0.500	0.480	0.513	0.480	0.528
Observations	1.188	1.152	1.144	1.144	1.124	1.124

*,**,***significant at 0.05, 0.01 and 0.001- levels,
[1]Education husband and wife, relative disposable income (M/K), summer interview, children, cohabiting, and renter. . Including health does not impact the coefficients in the table.
Source: Danish Time Use and Consumption Survey (DTUC) 2008-2009, own calculations.

When it comes to the spouses' retirement age – when s/he becomes 65 years of age – it is only when he reached that age that it impacted her retirement age, namely 1.4 times. When she was 65 years or older, it had no impact on when her husband retired (Table 5). Hence, when the

husband passed his 65th birthday there was an impact on his own and his wife's retirement, whereas her 65th birthday impacted only her own retirement not that of her husband.

We also find that the inclusion of the spouses' educational background, their relative income, having children, being married or cohabiting, and renters (Model III in Table 5) did not impact the correlation between the husband's or the wife's reaching the age of 65 years and their retirement decisions, nor did it have any impact on their spouses' decision. The coefficients remained of nearly the same size as those of the model without these controls (Model II in Table 5).

Because of the option of receiving early retirement benefit from the age of 62 years in 2008/09, many individuals left the labor market at that age, for which reason we replicated the analyses with the age of 61/62 years as the age limit, see Table 7. Unsurprisingly, the likelihood of retiring was smaller than around the age of 65 years independently of the model used, and again it is only when the husband reached the age of 62 years that the wife's retirement was affected. When she reached that age, it had no impact on her husband's decision regarding retiring.

For France, Stancanelli & Van Soest (2012a, 2014) find that at the age of 60 years, where early retirement is possible in France, the likelihood of retirement increased significantly for the husband as well as for the wife, whereas neither the husband's nor the wife's retirement age was influenced by their partner's 60th birthday.

For all models in Table 5 the R^2's are as high as 0.5.

5.3 Results – 2nd stage

Table 6 shows the impact of husbands and wives' retirement on their joint and individual leisure time taking into account that the retirement age depends on the spouses' ages, i.e. the first stage regression. For social leisure (leisure A) his or her retirement did not impact their joint time spent on this activity. Including other leisure activities (leisure B) the spouses' joint leisure increased by more than 1 hour or 39 % when she retired, whereas his retirement had no impact on their joint leisure.

We find the same pattern when eating is included as a leisure activity (leisure C). Hence, her retirement increased joint leisure time by more than 1 ½ hours or nearly 50 %, whereas his retirement had no impact on their joint leisure.

Concerning the husband and the wife's individual leisure time A, B and C, we find no impact of the partner's retirement, which follows expectations (Table 6). Nor did the husband have more social leisure time when he retired, whereas her retirement offered her nearly 1 hour and 20 minutes or 70 % more social leisure time. However, leisure time B increased by nearly 1 ½ hours or 30 % for a retiring husband, and 2 ¼ hours or 51 % for a retiring wife.

The biggest impact of retirement on leisure time is obtained when eating is included. Hence, retired husbands spent more than 1 ½ hours on leisure time (leisure C) compared with non-retired husbands, and for wives the difference was nearly 3 hours a day. The differentials measured in percentages, however, are of nearly the same size for the spouses irrespective of whether we look at leisure without and with eating included when the husband or the wife retires.

Table 6
Partners retirement and individual and joint leisure time –
2SLS instrument-regression[1], 55-74-year-olds 2008/09

	Individual leisure time man	% Change	Individual leisure time woman	% Change	Joint leisure time	% Change
Leisure A						
Man retired	.567 (.425)	21.7	-.578 (.391)	-28.9	-.0075 (.264)	-2.0
Woman retired	-.030 (.408)	-1.6	1.384*** (.376)	69.9	.330 (.251)	58.9
Constant	2.871*** (.381)		2.201*** (.351)		1.074*** (.237)	
Wald qui[2]	78.57***		76.15***		22.21**	
Adj. R^2	0.077		0.027		0.022	
Leisure B						
Man retired	1.467+ (.714)	29.9	-.746 (.627)	16.7	.204 (.578)	7.7
Woman retired	-.391 (.686)	-7.3	2.257*** (.602)	51.3	1.129* (.555)	39.2
Constant	3.309*** (.640)		4.730*** (.562)		3.383*** (.519)	
Wald qui[2]	49.20***		63.73***		65.08***	
Adj. R^2	0.065		0.067		0.077	
Leisure C						
Man retired	1.528+ (.782)	24.9	-1.079 (.686)	18.8	-.179 (.672)	-4.9
Woman retired	-.330 (.751)	-4.9	2.854*** (.659)	50.1	1.658** (.645)	47.5
Constant	4.500*** (.702)		6.149*** (.615)		4.337*** (.602)	
Wald qui[2]	51.25***		78.44***		65.43***	
Adj. R^2	0.070		0.074		0.066	

+,*,**,*** significant at 0.1, 0.05, 0.01 and 0.001- levels, [1]Controls: Education husband and wife, relative disposable income (M/W), summer interview, children, cohabiting and renter. Including health does not impact the coefficients in the table. Note: The coefficients do not change significantly if the retirement age is 62 years (not shown in table). Source: Danish Time Use and Consumption Survey (DTUC) 2008-2009, own calculations.

Compared with the results of Stancanelli & Van Soest (2012a, 2014) for France, the major difference is that we do not find any impact of Danish men's retirement on their wives' individual leisure time. In France the wife's leisure time decreases when her husband leaves the labor market. However, when French husbands retire, the couple's joint leisure time increases, which is not the case in Denmark, where there is no such impact on spouses' joint leisure

time. Although the decrease in French wives' individual leisure time is of the same size as the increase in joint leisure time, this does not mean more time spent on household work, which actually decreases, when their husbands leave the labor market.

Table 7
Linear likelihood models for partners' retirement at 62 years of age –
First-stage regression 2SLS, 55–74-year-olds 2008/09

	Model I		Model II		Model III	
	Man retired	**Woman retired**	**Man retired**	**Woman retired**	**Man retired**	**Woman retired**
Man 62+/<62 yrs	0.401***		0.413***	0.191***	0.407***	0.199***
	(0.034)		(0.036)	(0.035)	(0.036)	0.035
Woman 62+/<62 yrs		0.417***	0.042	0.353***	0.031	0.322***
		(0.033)	(0.035)	(0.034)	(0.036)	0.035
Partner's age	No	No	Yes	Yes	Yes	Yes
Controls[1]	No	No	No	No	Yes	Yes
Constant	-0.529***	-1.399***	-0.609*	-0.768***	-0.469***	-1005***
	.190	.185	0.243	0.237	0.258	.249
Adj. R^2	0.488	0.522	0.500	0.537	0.498	0.545
#	1.188	1.152	1.144	1.144	1.124	1.124

*,**,*** significant at 0.05, 0.01 and 0.001- levels,
[1] Education of the man and the wife, relative disposable income (M/W), summer interview, children, cohabiting, renter.
Source: Danish Time Use and Consumption Survey (DTUC) 2008-2009, own calculations.

6   Conclusion

There are a number of studies on when people retire from the labor market with the focus on work efforts, savings and economic conditions in general. However, only a few have addressed the impact of spouses' preferences for leisure on the desire to spend leisure time together. This is despite the fact that spouses' leisure complementarity may contribute to the understanding of joint retirement.

Here, we investigated the impact of married and cohabiting men and women's retirement on their joint and individual leisure time taking into consideration the influence of their preferences for leisure relative to income. For the causality problem – do preferences impact retirement or is it retirement that determines preferences – we have used the public pension age, when most people retire, as an instrument in the retirement estimation.

The information on the age of retirement stems from administrative registers in Statistics Denmark and DTUC-2008/09, which is a survey of randomly chosen Danes' labor market attachment, and time use for the same weekday and weekend day for both partners in married

and cohabiting couples. By looking at couples where the husband is aged 55-74 years and distinguishing between employed and retired spouses, we found that the latter group did not have more individual and joint leisure time than did the first group, and that leisure time is longer the broader the definition is of that time.

 We also found that simultaneous retirement – within a year's distance at the largest – did not impact the spouses' joint leisure time more than non-simultaneous retirement.

In the discontinuity regression analysis, where 65-year-olds – the old-age public pension age – was used as an instrument to avoid the problem of reverse causality – we found that the wife's retirement increased her social leisure time, leisure time extended, and leisure time inclusive of eating time, whereas leisure time and eating time, not the social leisure time, increased when the husband retired. However, we found no impact of the partner's retirement on the husband's or wife's individual leisure time. However, their joint leisure time inclusive of time spent eating increased, when the wife retired, whereas the husband's retirement had no impact whatsoever on the length of their joint leisure time.

Comparing these results with those for France, the difference is that in France the wife's leisure time decreases when her husband leaves the labor market. Further, when French husbands retire, the spouses' joint leisure time increases, which is not the case in Denmark, where there is no such impact on spouses' joint leisure time. Why this country differential appears is beyond the scope of this paper to explain.

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