Retirement Age Preferences: The Role of Social Interactions and Anchoring at the Statutory Retirement Age

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Abstract

Using a specifically designed survey, we investigate the role of the social network in shaping workers' retirement preferences. We find that the preferred retirement age is influenced by the advice and retirement decisions of coworkers, family, and friends. Workers value in particular the advice of their spouse and children and take their personal circumstances into consideration. Responses to vignette questions imply that workers increase their preferred retirement age with on average 3 months in response to a 1 year increase in the retirement age of coworkers, family and friends. Workers are particularly willing to postpone retirement if the planned retirement age was below the statutory retirement age. The results suggest that advice of the social environment and factors like 'social embeddedness' or social norms likely play a role when it comes to retirement decision-making.

Keywords Retirement planning · Retirement preferences · Reference points · Statutory retirement age

JEL Classification J26 · D12

1 Introduction

Worldwide, countries are increasing the statutory retirement age with the purpose of reducing government expenditures and raising labor force participation (OECD 2011). An increase in the statutory retirement age typically leads to an increase in the mean retirement age. In addition to financial incentives, social interactions and

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anchoring at the statutory retirement age may play an important role for the decision when to retire.

The importance of financial incentives in explaining individual retirement decisions is well-documented (e.g. Gruber and Wise 2004; Coile and Gruber 2007; Hanel and Riphahn 2012; Van Soest and Vonkova 2014; Gustman and Steinmeier 2015). At the same time, other studies suggest that the total participation effect of raising the statutory retirement age is larger than the pure effect of the underlying financial incentives. As an example, the 6 month increase in retirement age in response to the US Social Security reform of 1983 documented by Mastrobuoni (2009)¹ is larger than predicted on basis of financial incentives (Coile and Gruber 2000).

A possible explanation is that aggregate retirement patterns typically show ‘retirement peaks’ at key institutional ages, which cannot be fully explained by financial incentives in the social security and fiscal system. In many countries including the United States (Lumsdaine et al. 1996; Gruber and Wise 1999; Behaghel and Blau 2012) and the Netherlands (Van Erp et al. 2014), retirement schemes typically feature a ‘normal retirement age’ (the age at which ‘full’ retirement benefits are available) and an ‘early retirement age’ (the age at which retirement benefits are first available). In the US the early and normal retirement age were equal to 62 and 65 years, respectively, until 2003. Sometimes there are additional institutional features at these key institutional ages, such as the availability of Medicare at age 65 in the US, which may also contribute to retirement peaks. Lumsdaine et al. (1996) systematically investigate a variety of explanations and show that institutional features only partly explain observed retirement peaks at the ages of 62 and 65. They conclude that popular retirement ages must function as ‘the influence of custom or accepted practice’ leading to retirement peaks at these ages.

This conclusion suggests that retirement age decisions may be influenced by social interactions and/or anchoring. In this study, we use the term anchoring to refer to the use of a specific age as a reference point or an “anchor” that plays a special role when workers think about the timing of retirement. This specific retirement age may form an obvious starting point when planning for retirement, thinking ahead about the financial consequences and visualizing life and activities after work. Workers may then compare alternative scenarios for the timing of retirement with this basic scenario as a point of reference.² Institutional retirement ages are plausible candidates to play the role of such an anchor.

The term social interactions is used to indicate that other people may play an important role when workers think about their preferred age of retirement. Other individuals may simply provide advice or otherwise may impact retirement preferences through their own actions. The literature provides various examples of studies documenting a correlation between individual decisions and (peer) group behavior.

¹ In this reform, the normal retirement age (NRA) to collect Social Security was increased from 65 to 66 years.

² In their seminal work on heuristics and biases, Tversky and Kahneman (1974) explain why anchors are effective in decisions under uncertainty.

For example, natural experiments have shown an influence of shocks in individual income or consumption on the consumption of other individuals (Angelucci and De Giorgi 2009; Kuhn et al. 2011).³ As regards retirement decisions, Duflo and Saez (2002) document in a sample of university employees that workers respond to the retirement savings decisions of their coworkers. When coworkers increasingly enroll in retirement savings plans or increase the level of contributions, then workers are more likely to start participating themselves or increase their retirement plan contributions. Lieber and Skimmyhorn (2018) on the other hand find no peer effects among U.S. Army soldiers in their retirement savings. Brown and Laschever (2012) show that teachers are susceptible to the retirement age of their direct peers at the workplace. Hamman et al. (2016) document peer effects on the individual retirement timing for workers in German medium and large private establishments. Montizaan and Vendrik (2014) find that the individual well-being of workers in the Dutch public sector is affected by the retirement behavior of their colleagues.

In this paper, we use stated preference data to gain insight in the role of the social network in shaping individual retirement age preferences. Retirement is a once-in-a-lifetime event. Because there is no opportunity to learn from own experience, people may want to learn from other people's experiences. From a conceptual point of view, the optimization of retirement plans is a complex decision problem, as one has to consider both financial and non-financial consequences.⁴ Questions like "Can I afford to retire and how am I going to spend my time in retirement?" and "How does the satisfaction from working compare to enjoying leisure and what to do with the time that becomes available?" are intrinsically difficult to answer. In these respects, one can collect information and learn from discussions with other individuals in particular when they are also affected by the retirement decision such as for instance the spouse. Interdependencies between individual retirement preferences may also be related to 'social embeddedness' and 'social norms' (Van Solinge and Henkens 2007). Social embeddedness refers to directly interdependent retirement preferences, e.g. between spouses or between the individual worker and her direct social environment. Social norms refer to indirect interdependencies not specifically tied to a physical person. People may have a feeling about 'the right time' for retirement and value that specific retirement age more than alternative retirement ages because it is consistent with a social norm (Bernheim 1994).

We collect data in a controlled experimental setting. We have designed a survey with self-assessments and a series of vignette questions. The self-assessments in the first part of the survey contain questions about the respondent's "retirement advisors", and about whose personal situation they take into account in their retirement decision. The vignettes in the second part of the survey portray a fictive person

³ Other examples include Hanushek et al. (2003) who highlight the role of peer effects on student achievement and Topa (2001) who finds that individuals are more likely to be employed if the members of their social networks are employed and attributes this to sharing job information throughout social networks.

⁴ See Scholz et al. (2006) for an illustration of the mathematical complexity of the decision how to save optimally taken the retirement age as exogenously given. In real life, the saving decision and the choice when to retire are taken jointly and extend beyond financial considerations.

planning their retirement, and describe a change in the retirement behavior of a group of individuals in their social network. The retirement age of the social network varies between different versions of the vignettes, whereas financial incentives are kept constant in three vignettes and varied in the fourth vignette. This allows us to assess the individual's sensitivity of their retirement preferences to the social network's retirement age. In addition, we vary the information on the social network between the respondents. Each respondent is confronted with a male or female fictive person, with either coworkers or family and friends increasing their retirement age and with four different motives for retiring later. While based on stated preferences instead of actual decisions, our survey extends the study of Brown and Laschever (2012) by investigating the broad population of workers rather than teachers. In addition, the vignette questions enable us to confront all workers with the retirement decision and not just those who are close to retirement.

Our findings show that both social interactions and age anchoring at the statutory retirement age play an important role in retirement preferences. The main findings can be summarized as follows. First, individuals receive advice from a broad social environment, in particular the spouse and children but also family, friends and coworkers, and often take this advice into account when planning their retirement. Moreover, workers take the personal situation of their social network into account, in particular of the spouse and to a lesser extent of the children. Second, workers are influenced by the retirement age of the social network. A 1 year increase in the retirement age of coworkers or family and friends induces respondents to delay their planned retirement age by an average of 3 months. This effect is more pronounced when the increase in the social network's retirement age is motivated by financial incentives. Third, we identify a special role for the age of 65 years, which has been the statutory retirement age in the Netherlands for over 50 years.

The remainder of the paper is organized as follows. Section 2 briefly discusses the Dutch retirement institutions. Section 3 describes our data and research design. Sections 4 and 5 present the empirical results. Section 6 contains a discussion of these results and policy implications. Section 7 concludes.

2 Dutch Retirement Institutions

The Dutch retirement system consists of three 'pillars'. The first pillar is a flat state pension benefit (AOW), which is unrelated to the earnings history. Eligibility is determined by age and the number of years one has lived in the Netherlands.⁵ The state pension is financed on a pay-as-you-go basis, in other words contributions paid are not taken into account for eligibility nor for the level of the benefits. The payment of benefits starts at the statutory retirement age. It is not possible to claim earlier (later) as to receive lower (higher) benefits for the rest of the lifetime. Since the introduction of the AOW in the Netherlands in 1957, the first pillar statutory

⁵ Every year lived in the Netherlands when being between 15 and 65 years of age entitles 1–2% of the total state pension benefit.

Table 1 Details on increasing the statutory retirement age.

Source: Ministry of Social Affairs and Employment (<http://www.rijksoverheid.nl/onderwerpen/algemene-ouderdomswet-aow/wijzigingen-in-de-aow>, in Dutch)

Year	Statutory retirement age
2013	65 + 1 month
2014	65 + 2 months
2015	65 + 3 months
2016	65 + 6 months
2017	65 + 9 months
2018	66
2019	66 + 4 months
2020	66 + 8 months
2021	67

retirement age was fixed at 65 years. Starting in 2013, the statutory retirement age is being increased gradually. In 2021 the statutory retirement age will be 67 years (Table 1). Cohorts reaching the age of 67 after 2021 will face higher statutory retirement ages, depending on further increases in life-expectancy.

The second pillar of the Dutch pension system consists of mandatory retirement savings. These savings schemes are often organized at company or sectoral level. Employment in a specific company or branch determines enrollment in the company or industry pension fund or insurer. Individuals have no say in the level of pension contributions or the investment policy in these retirement plans (Van Rooij et al. 2007). Depending on individual preferences and the characteristics of the retirement plan, this pillar enables early or late retirement with actuarial fair adjustments in accrued pension rights. The pension plans in this pillar can be either defined-contribution (DC), defined-benefit (DB) or a mixture. Accrued pension rights are thus related to the pension contributions paid during the life-cycle. Contributions are tax-deductible and taxes are levied during the pay-out phase, which gives a tax advantage. Benefits are usually paid in the form of a lifelong annuity.

The third pillar, concerning voluntary individual retirement savings, is relatively small in the Netherlands. It is directed at individuals who do not have access to the second pillar (e.g. the self-employed) and employees who have accumulated insufficient savings with their employer. Savings in the third pillar pension may receive a similar tax treatment as second-pillar pensions.

3 Data and Study Design

3.1 Data

Our survey was fielded among members of the CentERpanel. This household panel is run by CentERdata at Tilburg University and widely used for academic research (see e.g. Kapteyn et al. 2013; Van Soest et al. 2012; Van Santen et al. 2012; Kramer

2016). The panel is representative of the Dutch speaking population and answers on a recurring basis survey questions. These surveys are mainly related to the broad financial situation (e.g. income, wealth holdings, pensions but also expectations on income, etc.) of participants and some psychological concepts, e.g. perceptions of risk. These data, known as the DHS (DNB Household Survey), are available for academic research without cost.⁶ Our survey was put forward to 2840 household members aged 16 years or older. 1845 took part in the survey, giving a response rate of 65%. The data collection took place in an online survey from 11th to 15th of May 2012.⁷ Main background characteristics as well as descriptive statistics for the explanatory variables used in the regressions analysis are given in “Appendix 1”.

When presenting descriptive results in the empirical section, we weight the descriptive statistics with regard to age, gender, education and personal income as to obtain a representative view of the Dutch population. Note that otherwise in particular young individuals would be underrepresented since their response is relatively low, which is a known feature of surveys on retirement topics. As we are especially interested in future retirement behavior, we drop respondents who are 65 or older and those who have retired early and restrict the analysis to respondents who are working or have worked in the past and completed the whole survey. This leaves us with a sample size of 1113 respondents.

3.2 Study Design

The first part of our survey examines whether the social environment of respondents has an influence on their retirement preferences and which members of the social environment are most relevant. The first set of questions is asked to the respondents who currently work or have worked before. We start asking the respondents who is likely to provide them with retirement advice: “Which of the following persons do you expect to give you advice about when to retire? Spouse/children/friends/family/coworkers/neighbors/financial advisor or pension fund”. For each of these response categories, respondents have to choose between ‘not at all’, ‘somewhat’ and ‘certainly’.

Advice may take different forms: it can be actively sought for e.g. by hiring a financial advisor, but it can also be casually given for example during a lunch with coworkers. The latter unsolicited advice may be less meaningful for the respondents than advice and information they have asked for themselves. More in general, the value that respondents attach to advice and information will most likely depend on the source. To explore the relevance of this advice, respondents who indicate to receive advice are asked a follow-up question on how much weight they attach to the advice: “In the previous question we asked you which persons give you advice. What weight do you attach to the advice of the following persons? Spouse/children/

⁶ For more information, see <http://www.centerdata.nl/en>.

⁷ Panel members without internet access answer the questions via special equipment provided by CentERdata.

friends/family/coworkers/neighbors/financial advisor or pension fund". Response categories are shown only if the respondents has indicated to expect advice (choosing somewhat or certainly in the previous question). For each of these response categories, respondents have to choose between 'none', 'a little', 'much', and 'a great deal'.

The impact of the social network can go beyond giving advice and providing information. Indeed, individuals may take the personal circumstances of some other members of their network into account. To explore the argument of social embeddedness, we ask: "For which of the following persons do you take the personal situation into account for your decision when to retire? *Spouse/children/friends/family/coworkers/neighbors*". For each of these response categories, respondents have to choose between 'not at all', 'a little', 'much', and 'a great deal'. The term personal situation may reflect many different situations, including the plan to take care of a sick family member or to spend time with children and grandchildren for instance.

The second part of our survey offers vignettes to the respondents to examine their reaction to changes in the retirement age of the social environment. These vignettes offer the possibility to study the sensitivity of the individual retirement age to the retirement age of the social environment in a controlled setting. Letting the respondent answer the questions for a fictive person with a given initially planned retirement age, alleviates the possible concern about external validity. The use of a fictive person with a given initially planned retirement age is a parsimonious way to summarize all other possible relevant features of the fictive person to choose an individual retirement age, such as retirement wealth and health. In this way, we require respondents to answer questions picturing the same information for original retirement plans.⁸ Van Beek et al. (1997) offer an example of a study exploiting vignettes in a similar way, in order to elicit preferences of employers regarding the hiring of employees.

Before the respondents answer the vignette questions, they receive an introductory text with information on a fictive flexible retirement scheme. This scheme emphasizes the availability of choice options around a standard retirement age. It explains that earlier take-up leads to lower retirement benefits, and later take-up yields higher benefits for the remainder of the life-time. The wording of the retirement scheme is as follows (the percentages coincide roughly with actuarial fairness): "Nowadays, policy makers discuss a new retirement scheme. Current plans provide the possibility to decide when to start receiving pension entitlements (state as well as employer pension). If you have worked 40 years and retire at the standard retirement age, total pension entitlements (including state pensions) equal 70% of average gross income. The standard retirement age now equals 65 years. Retiring a year before the standard retirement age entails an approximately 7% lower monthly pension benefit for the remainder of your life. Retiring a year after the standard retirement age entails an approximately 7% higher monthly pension benefit for the remainder of your life".

⁸ In the empirical analysis, we present results comparing the vignette responses and report regressions as well to learn about the impact of background characteristics on the reaction to changes in peer behavior.

Table 2 The different retirement ages in the vignettes

	Original retirement age plan of vignette person	Original retirement age of social environment	New retirement age of social environment
Vignette 1	65	65	66
Vignette 2	65	65	67
Vignette 3	64	64	65
Vignette 4	64	65	66

The vignettes sketch the situation of a fictive person, who is faced with the question how to adjust their retirement age. We explain that this person has a planned retirement age when retirement is still far away. Next, we tell that once the person turns older, it appears that the typical retirement age of individuals in their social environment has changed. The respondent is then asked to evaluate whether they would change the retirement planning being the vignette person. An example of a vignette is the following: “John is not yet eligible for retiring. He does think about it from time to time. John plans to retire at age 65, considering this retirement scheme. At this time, most of his older coworkers retire at age 65. When John turns 60 years old, most coworkers retire at age 66. This is a consequence of people experiencing longer and healthier lives”. After explaining this vignette, we ask “What would you do in the situation of John?” Response categories in this vignette example are: retire before 65/retire at 65/retire at 65.5/retire at 66/retire at 66.5/retire at 67/retire later than age 67.

The questions are designed to elicit variation both within and between respondents. Between respondents the vignettes differ in the gender of the vignette person (‘John’ or ‘Lisa’), the nature of the social environment (‘coworkers’ or ‘family and friends’), and the reason for other individuals to adjust their retirement age (‘individuals living longer and healthier lives’ (given in the preceding example), ‘more need for experienced workers by employers’, ‘longer working due to the financial consequences of the economic crisis’, and ‘a one year increase in the statutory standard retirement age’). Out of these four different reasons, only one reason induces financial incentives in terms of a change in the available retirement scheme (which is caused by the increase in the statutory retirement age).

The variation within respondents follows from asking each respondent four vignettes. These vignettes vary the retirement ages of the vignette person and their social environment. Differences between the retirement ages of the vignettes shed light on the influence of the retirement age of the social environment on the planned retirement age. Table 2 shows the different variations. Vignette 1, for instance, shows the age variation in the example above. Vignettes 1 and 2 are similar except for the new retirement age of the social environment which increases by 2 years in vignette 2 instead of 1 year. The difference in answers to these two vignette questions isolates the effect of a 1-year increase in the social environment’s retirement age on the respondent’s preferred retirement age. Vignette 3 is similar to vignette 1 but all age are shifted 1 year downwards, which enables an investigation of the importance of the statutory retirement age at the time of the survey. Vignette 4 is

included to investigate the responses when there is a difference in the original retirement age plan between the vignette person and their social environment. “Appendix 2” gives an overview and the precise wording of the main survey questions.

The self-assessments in the first part of our study are designed to provide direct information on the role of advice given by other people and the role of social embeddedness (or direct interdependencies). The vignettes in the second part of the study are designed to measure indirect interdependencies related the social network (including social norms for instance). Respondents may also use the behavior of their social network as a different source of information or implicit advice as opposed to the role of explicit advice and information measured through the self-assessments. If respondents start guessing for the reason of the actions of their social network in the vignette questions, this would introduce noise and complicate the interpretation of the responses. Therefore, the vignettes include information on the motivation for the change of retirement plans in the social network. While we cannot observe how respondents interpret the behavior of the social network, reporting the motivation in the vignette minimize the chance that respondents give different interpretations. Importantly, the main focus of the vignette questions is to measure the impact of non-financial factors. Therefore, only one motive (i.e. the reduction of pension rights by on year) has financial consequences and in three out of four motives financial incentives are kept unchanged.⁹ In addition to the social network effects, the vignette questions provide information on the possible role of anchoring at the age of 65 which is derived from the use of different age patterns conform Table 2.

4 Empirical Results on Advice and the Personal Situation of the Social Environment

4.1 Descriptive Evidence

First, we first explore the role of advice. As potential advisors, we consider spouse, children, friends, family, coworkers, neighbors and professional financial advisors. The responses show that the propensity to give advice and the impact on the respondent’s retirement plans vary among these advisors (Table 3, panels A and B). Approximately 90% of the non-retired respondents indicate they discuss retirement plans with their spouse (certainly or somewhat). Around 90% of this group attaches much or a great deal of weight to this advice (which could be related among other things to the spouse being very well aware of the respondent’s preferences and situation or the result of some bargaining within the household as the retirement decision affects both partners). Zooming in at the subgroup of cohabiting respondents (either married or unmarried), 97% indicate to receive much or a great deal of advice from

⁹ Also in these three motivation, it cannot be ruled out that some respondents think there might be a financial reason to retire later, in particular when the motivation of the social network to retire later refers to the consequences of the financial crisis.

Table 3 Influence of different groups in the social environment on retirement plans

Panel A	Which of the following persons do you expect to give you advice about when to retire?						
	Spouse	Children	Friends	Family	Coworkers	Neighbors	Financial advisor/pension fund
Certainly	65.2	18.5	10.0	10.6	11.5	0.6	15.9
Somewhat	23.8	44.2	48.4	48.9	51.4	13.1	45.5
Not at all	11.0	37.3	41.6	40.6	37.2	86.3	38.6
N	1113	1113	1113	1113	1113	1113	1113
Panel B	What weight do you attach to the advice of the following persons?						
	Spouse	Children	Friends	Family	Coworkers	Neighbors	Financial advisor/pension fund
A great deal	57.4	16.4	5.2	7.1	2.7	4.7	14.7
Much	33.9	47.9	33.8	34.6	23.4	7.6	42.1
A little	8.4	35.3	59.1	56.1	70.8	79.7	42.8
None	0.3	0.4	1.9	2.2	3.1	8.0	0.4
N	951	628	616	586	668	113	665
Panel C	Of what persons do you take the personal situation into account for your decision when to retire?						
	Spouse	Children	Friends	Family	Coworkers	Neighbors	
A great deal	56.2	15.6	1.1	2.7	0.9	0.0	
Much	27.3	30.5	9.0	11.8	7.6	1.4	
A little	6.4	28.0	32.8	35.0	33.3	10.2	
None	10.1	25.8	57.1	50.5	58.2	88.4	
N	1113	1113	1113	1113	1113	1113	

Weighted percentages of respondents who are non-retired and below 65 years. Percentages may not sum up to 100 due to rounding. N=number of respondents

their spouse and within this group only 7% says to attach none or little weight to the advice of the spouse.¹⁰

In comparison to the spouse, children, friends, family, coworkers and the financial advisor or pension fund are less often expected to give advice. Still, around 60% of the respondents indicate to receive at least some advice from these groups. Moreover, if advice is received, a non-negligible number of respondents attach much weight to this advice. In particular the advice from children and financial advisors is viewed as important: around 60% of the respondents attach much or a great deal of weight to their advice. The advice of children may be valuable because they are

¹⁰ For comparison: 62% of the single respondents expect to receive advice from a partner when nearing retirement and 19% attach little or no weight to this advice.

familiar with preferences and circumstances, while professional advisors are likely to give objective advice on financial consequences that may be difficult to assess for the respondent. Advice from neighbors, who are generally neither experts nor very closely related to the respondents, is relatively unimportant.

The role of the social environment can extend beyond giving advice, as the utility that individuals derive from work or retirement may be interrelated with the social environment. For example, Coile (2004) finds evidence for such interdependencies as she finds that 62% of men who are to retire in the near future, look forward to retirement only if the partner will retire as well. As another example, Schirle (2008) finds that the increased labor force participation of older married men can be explained by the increased labor force participation among women. These studies suggest that leisure has more value when enjoyed with other members of the household. Apart from the enjoyment of joint leisure, there may be other reasons to take the personal situation of the social environment into account. For instance, the wish to take care for a sick family member or to spend time with grandchildren can influence the decision when to retire.

Indeed, our results confirm that the personal situation of the partner is very important for retirement preferences (Table 3, panel C). More than 80% of the respondents take the personal situation of the spouse much or a great deal into consideration.¹¹ In addition, more than 45% of the respondents take the personal situation of the children into account. The personal situation of others plays a relatively minor role in the decision when to retire, although it is important for some respondents. For instance, 10–15% say that the personal situation of family or friends is taken into account.

4.2 Multivariate Regression Analysis

Next, we run multivariate probit regressions to explore the correlation between the respondent's personal characteristics and their responses to the three questions on the role of their social environment. We group the responses into 0–1 dummy variables, where the dummy for the first question equals 1 if the respondent is certain to receive advice, and 0 otherwise. Similarly, for the second and third question, the dummy equals 1 when the respondents give much or a great deal of weight to this advice, respectively, take the personal situation of other individuals a great deal or much into account. The outcomes of these dummy variables are regressed on various personal characteristics of the respondent, including gender, age, education, income, and a measure for the respondents' financial knowledge. Financial literacy is captured by a dummy which takes the value 1 if respondents answer three literacy questions correctly and 0 otherwise. These three literacy questions are the questions introduced by Lusardi and Mitchell (2011) which have frequently been used in the international literature (see "Appendix 2" for the wording). In addition to their personal characteristics, we include information on the personal situation

¹¹ This number varies substantially between respondents that do (98%) and do not cohabit (64%).

of respondents, i.e. whether they are currently working, whether they are an owner-occupier or renter, have a partner, and whether the household includes children or not. Tables 9, 10 and 11 in “Appendix 3” present the results.

The regression results reveal that respondents with a partner or children more often expect advice from their partner or children and take the personal situation of their partner and children into account. Moreover, women attach more weight than men to the advice of the spouse, children, and other family members. Also, women attach more weight to the advice of professional advisors such as the pension fund, although this coefficient is significant at the 10% level only.

Younger respondents more often expect to receive advice, in particular from the spouse, children, friends and family. This may be related to older respondents already having concrete plans about when to retire. Indeed, when individuals come closer to retirement they have more often planned and taken concrete steps for retirement (Van Rooij et al. 2011, 2012). Similarly, more concrete retirement plans explain that, compared to younger respondents, the elderly give less weight to advice given by friends, family or neighbors and that their decision does not depend on the personal situation of other people. While the latter finding is perhaps surprising at first sight, it could be related to younger workers making plans for when to retire based on desirability as opposed to older workers who are mainly concerned about feasibility (Van Schie et al. 2015).

Higher educated respondents more often expect advice from the spouse, children and friends. Compared to respondents with the lowest level of education, higher educated respondents attach more weight to professional advice. In a similar vein, respondents with a high level of financial literacy attach less weight to the advice given by friends, family, coworkers and neighbors.

Concerning income, there seems to be a differential effect from personal and household income. When personal income is above the lowest income category, respondents are less likely to receive advice and to attach weight to advice received. However, when household income is relatively high, respondents are more inclined to receive advice and attach weight to this advice, in particular from the spouse who is contributing to the high level of household income.

Summarizing, the relations documented by the multivariate regression analysis seem intuitive overall, thus supporting the validity of the survey responses. In particular, the advice and personal situation of close relatives such as the spouse and children seems important and women and men differ to some extent in the way they gather information (which applies to high vs. low educated respondents as well) and what feeds into their preferences such as the personal situation of close relatives.

5 Empirical Results on the Role of the Retirement Age of the Social Environment

5.1 Descriptive Evidence from Vignette Questions

The influence of the social environment may go beyond giving advice. For instance, individuals may learn from the retirement decisions from members in their social

Fig. 1 Retirement plans when the social environment retires at 66 or 67 (instead of 65). *Notes:* This figure shows the distribution of weighted responses by non-retired respondents younger than 65 when the initial plan is to retire at age 65 and coworkers or family and friends increase their retirement age from 65 to 66 (vignette 1) or 67 (vignette 2)

network. We examine this role of the social environment using the vignette questions introduced in Sect. 3. These questions ask respondents what they would do in a hypothetical situation in which members of the social environment change their retirement behavior.

More than half of the respondents increase their—originally planned—retirement age when members in the social environment retire later (Fig. 1). More than half of these respondents, i.e. more than a quarter of all respondents, change the preferred retirement age in a similar way as their social environment. In vignette 1, which states that most coworkers or family and friends adjust the retirement age from 65 to 66 years, almost 35% of the respondents indicate to retire at 66 years as well. In vignette 2, which states that most coworkers or family and friends adjust the retirement age from 65 to 67 years, more than 25% of the respondents indicate to retire at 67 years as well. In both vignettes, about 40% of the respondents stay with the original retirement age of 65. The latter choice is consistent with a framework that puts financial incentives central in decision making, as financial incentives are kept unchanged.¹² However, an alternative explanation is that the age of 65 constitutes a

¹² In fact, financial incentives are kept unchanged in three out of four vignettes, depending upon the motive of coworkers or family and friends to change the retirement age. In the next section, we investigate whether the different motives lead to different responses.

Fig. 2 Retirement plans when the social environment retires at 66 (instead of 65) and when the social retirement retires at 65 (instead of 64). This figure shows the distribution of weighted responses by non-retired respondents younger than 65 when the initial plan is to retire at age 65 and coworkers or family and friends increase their retirement age from 65 to 66 (vignette 1) or when the initial plan is to retire at age 64 and coworkers or family and friends increase their retirement age from 65 to 66 (vignette 3)

reference point in retirement decision making.¹³ Recall that the statutory retirement age was set equal to 65 years at the introduction of the old age state pension in the Netherlands in 1957. Thereafter, the statutory retirement age remained equal to 65 for over half a century until it was increased to 65 years and 1 month in 2013.

To further explore the role of the age of 65, we compare the responses to vignettes 1 and 3 (Fig. 2). Vignette 3 states an initially planned retirement age of 64 for the vignette person as well as for coworkers or family and friends and an increased retirement age of 65 (compared to 65 and 66, respectively, in vignette 1). When the initial age is 65, less people tend to follow the social environment to the new age of 66. Specifically, 30% of respondents stick to the original plan when the initial retirement age is 64 compared more than 40% when the initial retirement age is 65. Likewise, if the initial retirement age is 64 and the new retirement age of coworkers (or family and friends) is 65 respondents are more likely to follow the behavior of the social environment than in the case of 65 being the initially planned retirement plan and 66 the retirement age of the social environment. Again, the difference is about

¹³ Note that the role of the age of 65 could partly be related to the fact that the introductory text before asking the vignette questions explains the current situation including that 65 is currently the standard age of retirement and that workers can choose to retire earlier or later. This information is not likely to come as a surprise to the respondents however since at the time of the survey 65 had been the state pension age for several generations.

10 percentage points in favor of the age of 65. The comparison between vignettes 1 and 3 thus confirms excess retirement at the age of 65.¹⁴

5.2 Modeling and Empirical Estimates

The responses to the vignette questions as shown in Figs. 1 and 2 provide qualitative evidence of the relevance of retirement decisions by members in the social environment for individual retirement planning. Below, we present and estimate an econometric model to obtain empirical estimates for the size of this effect.

We estimate the model presented in Eq. (1) below and exploit the fact that every respondent answers all four vignettes. For respondent i and vignette question j ($j = 1, \dots, 4$) this model treats the dependent variable (the respondents' preferred retirement) R_{ij} as a cardinal variable. We rescale the dependent variable as to measure the number of years relative to the initially planned retirement age for the fictive person in the corresponding vignette.¹⁵

$$R_{ij} = X_i' \eta_j + F_i' \beta_j + \vartheta_j + \rho_i + \varepsilon_{ij} \quad (1)$$

The change in the preferred retirement age R_{ij} depends on a vignette specific constant ϑ_j and question characteristics F_i . The vignette specific constant captures the age-specifics of each vignette (i.e. the original plan for the retirement age and the change in the retirement age of the social environment). The question characteristics vary between and not within respondents. In particular, we vary three question characteristics between respondents: the gender of the vignette person, the reason for members in the social environment to increase their retirement age, and whether the social environment in the vignette refers to either 'coworkers' or 'family and friends'. Individual socio-demographic characteristics X_i are included to capture sources of heterogeneity among respondents. These characteristics include gender, age, education, personal and household income, employment status, home ownership, and dummies for living together with a partner and children, respectively. In addition, we include a measure for financial literacy which is shown to be an important determinant of financial decisions in general and retirement decisions in particular (Van Rooij et al. 2012, 2014). We measure literacy as a dummy that equals 1 for respondents that answer correctly the three financial literacy questions developed by Lusardi and Mitchell (2011) which questions have been widely used in the academic literature. The term ρ_i captures unobserved individual heterogeneity which may affect individual retirement age preferences. For instance, respondents in a bad health

¹⁴ Recall that the Dutch state pension AOW provides a basic flat income, which is unaffected by labor income. As second pillar pensions are actuarially neutral, the Dutch pension system does not generate financial incentives to retire specifically at the official state pension age.

¹⁵ The first answer 'before 65 (or 64) years of age' and the last answer 'after 67 (or 66) years of age' on the answer scale are assigned the values -1 and 3 , respectively. Since there are only few observations in these categories, we do not explicitly model the truncated nature of these values. Moreover, we have verified that estimation of a model that treats the dependent variable as an ordinal variable yields similar results.

Table 4 Estimated effects of vignette characteristics on the preferred retirement age

	Vignette 1 (1)	Vignette 2 (2)	Vignette 3 (3)	Vignette 4 (4)	Vignette 1–4 (5)
Female	0.01 (0.06)	0.04 (0.06)	−0.05 (0.06)	0.01 (0.06)	−0.00 (0.05)
Age (<i>baseline</i> : ≤ 39 years)					
Age: 40–54 years	−0.08 (0.06)	−0.12* (0.07)	−0.05 (0.07)	−0.05 (0.07)	−0.07 (0.06)
Age: 55–64 years	−0.15** (0.07)	−0.24*** (0.08)	−0.04 (0.07)	−0.09 (0.07)	−0.12* (0.06)
Education (<i>baseline</i> : low)					
Education: intermediate	0.06 (0.06)	0.08 (0.07)	0.05 (0.07)	−0.04 (0.07)	0.04 (0.06)
Education: high	0.22*** (0.07)	0.21*** (0.07)	0.17** (0.07)	0.06 (0.07)	0.17*** (0.06)
Net household income (<i>baseline</i> : < €2000)					
Income: [€2000–€3500]	−0.07 (0.07)	−0.04 (0.07)	−0.07 (0.07)	−0.02 (0.07)	−0.05 (0.06)
Income: ≥ €3500	−0.02 (0.08)	0.01 (0.09)	0.05 (0.08)	0.06 (0.08)	0.03 (0.07)
Net personal income (<i>baseline</i> : < €1000)					
Income: [€1000–€2000]	0.13** (0.06)	0.12* (0.07)	0.10 (0.06)	0.12* (0.07)	0.12** (0.06)
Income: ≥ €2000	0.06 (0.08)	0.12 (0.09)	−0.02 (0.09)	0.07 (0.09)	0.05 (0.08)
No paid job now	0.04 (0.07)	0.08 (0.07)	0.04 (0.07)	0.04 (0.07)	0.05 (0.06)

Table 4 (continued)

	Vignette 1 (1)	Vignette 2 (2)	Vignette 3 (3)	Vignette 4 (4)	Vignette 1–4 (5)
Home owner	−0.04 (0.06)	0.00 (0.07)	−0.02 (0.06)	−0.05 (0.07)	−0.03 (0.06)
Has partner	0.01 (0.07)	−0.06 (0.08)	−0.09 (0.07)	−0.10 (0.07)	−0.05 (0.06)
Has kids	−0.15*** (0.06)	−0.18*** (0.06)	−0.13** (0.06)	−0.20*** (0.06)	−0.16*** (0.05)
Has 3 literacy questions correct	0.03 (0.05)	0.03 (0.06)	−0.00 (0.05)	0.01 (0.05)	0.02 (0.05)
Vignette characteristics					
Vignette person = female (baseline: male)	−0.04 (0.05)	0.03 (0.05)	−0.02 (0.05)	−0.03 (0.05)	−0.02 (0.04)
Social environment of vignette person = 'Family and friends' (baseline: coworkers)	−0.13*** (0.05)	−0.13** (0.05)	−0.10** (0.05)	−0.14*** (0.05)	−0.12*** (0.04)
<i>Social environment's reason for working longer (baseline: 'people live longer and healthier lives')</i>					
Reason: 'More need for experienced employees'	0.01 (0.07)	0.03 (0.08)	−0.03 (0.07)	0.06 (0.07)	0.01 (0.06)
Reason: 'Financial consequences of the economic crisis'	0.11* (0.07)	0.21*** (0.07)	0.06 (0.07)	0.19*** (0.07)	0.13** (0.06)
Reason: 'Reduction of pension rights by one year'	0.18*** (0.07)	0.27*** (0.07)	0.16** (0.07)	0.23*** (0.07)	0.20*** (0.06)
<i>Vignette intercepts (θ_j)</i>					
Vignette 1	0.54*** (0.11)				0.57*** (0.10)
Vignette 2		0.70*** (0.13)			0.82*** (0.10)

Table 4 (continued)

	Vignette 1 (1)	Vignette 2 (2)	Vignette 3 (3)	Vignette 4 (4)	Vignette 1–4 (5)
Vignette 3			0.80*** (0.12)		0.75*** (0.10)
Vignette 4				1.05*** (0.12)	0.99*** (0.10)
Log likelihood	–4024				–4059
Number of respondents	1113				1113

Dependent variable is the number of years increase in the retirement age relative to the initial planned retirement age of the fictive person. Vignette numbers correspond to the numbering in Table 2. The last column restricts all coefficients (for demographic variables and vignette characteristics) across the four vignette questions to be the same, except for the vignette intercepts. Standard errors in parentheses. ***, **, * denote statistical significance at 1, 5 and 10%, respectively

situation, may have a preference for retiring early regardless of the decisions in the social environment. The unobserved characteristics are assumed to be uncorrelated with the observed characteristics and to follow a normal distribution $N(0, \sigma_\rho^2)$. Finally, ϵ_{ij} presents an idiosyncratic error term which is assumed to be normally distributed $N(0, \sigma_{\epsilon_j}^2)$. The model is estimated using simulated maximum likelihood, where the individual contribution to the maximum likelihood function is equal to:

$$L_i = \int_{-\infty}^{\infty} \prod_{j=1}^4 \varphi \left(\frac{R_{ij} - X'_i \eta_j - F'_i \beta_j - \vartheta_j - \rho_i}{\sigma_{\epsilon_j}} \right) \frac{1}{\sigma_\rho} \varphi \left(\frac{\rho_i}{\sigma_\rho} \right) d\rho_i \quad (2)$$

The unobserved heterogeneity is approximated by drawing 50 times from a standard normal distribution and using Halton draws.¹⁶ Table 4 presents the estimation results.

First, we discuss the results of the most general model specification listed in columns 1–4 of Table 4. This model specification imposes no restrictions on the coefficients. In other words, the coefficients of socio-demographic variables and vignette characteristics vary between the four vignettes. The estimation results show for all vignette questions that an increase in the retirement age of coworkers has a larger effect on retirement preferences than a similar increase in the retirement age of family and friends. The difference amounts to 1–2 months later retirement (corresponding to coefficient point estimates between -0.10 and -0.14).

The impact on retirement age preferences is larger when the social environment has a financial motive to postpone retirement, compared to a health motive or employer preferences. A reduction of pension rights equal to 1 year of benefits leads to the largest response, i.e. an additional delay in retirement of 2 or 3 months. The reason ‘Consequences of the financial crisis’ delays the preferred retirement age with up to 2 months.

Older individuals seem to be less influenced by their social environment, as there is a negative relation between age and the impact of the vignettes on the preferred retirement age. Respondents between the ages 55 and 64, who are nearing their pension, follow the increased retirement age of the social environment to a lesser extent than younger persons. This is consistent with our earlier finding that the elderly are less inclined to receive or follow advice on when to retire. Having children also has a negative impact on the extent to which respondents follow the increased retirement age of the social environment. On the other hand, respondents with an intermediate personal income are more inclined to follow the increase in retirement age than respondents with relatively low or high income. Similarly, compared to lower educated respondents, respondents with college or university degrees show a stronger reaction to the increase in retirement age. While it is surprising that higher educated respondents respond more to ‘behavioral’ factors, this finding is consistent with

¹⁶ For Halton draws m draws is used (Cappellari and Jenkins 2006). We have verified that a higher number of draws does not affect the results.

Table 5 Magnitude of vignette effects (different retirement ages of social environment) on average retirement age

	Effect on average retirement age
Social environment's new retirement age is 67 instead of 66 (vignette 2 vs. vignette 1)	0.25*** (0.02)
Initial retirement age of vignette person, initial retirement age of social environment, and new retirement age of social environment equal to 64/64/65 instead of 65/65/66 (vignette 3 vs. vignette 1)	0.19*** (0.02)
Initial retirement age of vignette person is 64 instead of 65 (vignette 4 vs. vignette 1)	0.42*** (0.02)

Standard errors in parentheses. ***, **, * denote statistical significance at 1, 5 and 10%, respectively. Vignette numbers refer to Table 2

the higher responsiveness of high educated employees to increases in the statutory retirement age documented by Behaghel and Blau (2012).

The coefficient estimates in columns 1–4 in Table 4 do not differ much between the vignettes. We formally test the hypothesis of equal coefficients for the four vignette questions by estimating a restricted version of our model. The restricted version imposes the coefficients on the socio-demographic characteristics and the vignette characteristics to be the same for the four vignettes. The only exception are the vignette-specific intercept terms, since these capture the vignette specificities. The estimates for the restricted model are reported in column 5 of Table 4. Since the restricted model is nested in the general model, we can test the null hypothesis of equal coefficients with a likelihood ratio test. The test statistic equals 69.9 (p value: 0.12). Hence, the restricted model is not rejected in favor of the more general specification. The advantage of the restricted model is that differences in vignette intercepts have a clear interpretation.¹⁷ These differences in intercepts reflect the differences in average age effects arising from the different vignette questions. Therefore, we refer to the restricted model when discussing the vignette estimates in the remainder of the paper.

5.3 Impact on the Preferred Retirement Age

The estimates for the vignette specific intercepts in Table 4 provide information on the average impact on the preferred retirement age of each of the four vignettes. The first vignette intercept shows the average effect on the retirement age for a 'baseline' respondent when coworkers increase their retirement age from 65 to 66 because people live longer and in good health. The baseline respondent refers to a male respondent, aged below 40 years with low education, low personal and household income, who is working, has no partner or kids and did not answer the three literacy

¹⁷ Since coefficient estimates of socio-demographic variables and vignette characteristics vary across the four vignettes in the unrestricted model, differences in these estimates show up in the vignette specific intercepts, even when differences in the coefficient estimates are insignificant.

questions correctly. The first vignette intercept is estimated at 0.57 which means that the average baseline respondent increases their retirement age with 0.57 years or 7 months (12×0.57) from the original plan of 65 years to 65 and 7 months. For respondents with different characteristics the total effect on the retirement age may be somewhat higher or lower. For instance, a highly educated respondent with otherwise similar personal and question characteristics will on average prefer to work 9 months longer ($0.57 \times 12 + 0.17 \times 12$).

This example highlights that the heterogeneity in responses is not invariant to the personal situation of the respondent. More in general, we cannot rule out that unobserved individual preferences of respondents affect their responses. For instance, the average 7 month increase in the retirement age for a baseline respondent in vignette 1 may partly reflect respondents using a different initially planned retirement age than the one given in the vignette question. However, using the difference between vignette intercept 2 and vignette intercept 1, we are able to derive an effect of raising the social environments' retirement age with an additional year that corrects for these influences outside the vignette question. This estimate can be seen as a diff-in-diff estimate, where we relate the difference in the preferred retirement age as provided by the respondent to the difference in the change in retirement age by the vignette person (from 66 in vignette 1 to 67 in vignette 2). Table 5 shows that this difference is precisely estimated at 0.25 which means that an increase in the retirement age of the social environment by 1 year leads to an average effect on the retirement age of the respondent of 3 months (0.25×12).

In a similar way, we can compare the estimates of vignettes 1 and 3 to derive an estimate of the size of the 'anchoring at 65' effect. Recall that Fig. 2 suggested that part of the respondents have a tendency to stick to the retirement anchor age of 65, which used to be the statutory retirement age in the Netherlands for more than half of a century. In particular, respondents postpone their retirement more easily in vignette 3 with an initially planned retirement age of 64 years and an increase in the retirement age of the social environment to 65 years (compared to 65 and 66 years, respectively, in vignette 1). Using the difference in vignette coefficients from Table 5, we can estimate the size of this anchor age effect at about 2 months (0.19×12).

5.4 Sensitivity Analysis

So far, we have considered vignettes in which the planned retirement age of the vignette person coincides with the current retirement age of coworkers or family and friends. A possible concern is that respondents interpret this as a signal that the fictive person wants to retire at the same age as the social environment. This could bias results towards the finding of a social environment effect. To investigate this concern, we have included a vignette question in which the original retirement age plan of the respondent differs from the original retirement age of the social environment (see Table 2, vignette 43). Recall that in this vignette the fictive individual originally plans retirement at age 64, whereas the retirement age of individuals in the social environment goes up from 65 to 66.

Table 5 (row 3) shows that compared to vignette 1, where the individual's original retirement age is 65 there is a 'catching-up effect' in vignette 4. The average catching-up effect is estimated at 5 months (0.42×12). Zooming in on the individual responses to vignette 4 shows that 25% of the respondents raise their preferred retirement age from 64 to 66.¹⁸ Thus, an important part of the individuals mimics the retirement age of coworkers or family and friends. These results again show that the social environment's retirement decisions feed into the respondent's individual preferences for the retirement age, even though the vignette portrays an originally planned retirement age that deviates from the initial retirement age of coworkers or family and friends.

Another possible concern is that many respondents may not (yet) be interested in their retirement and have not thought much about when to retire or how they will take this decision. These respondents are most likely not very confident in answering questions on the retirement age. When respondents are not confident in their answer they may use 'simple' response strategies while at the same time it is not obvious that they actually plan to display this behavior in practice. Two possible response strategies are 'stick to the original retirement age' or 'report the retirement age of the social environment'. To check whether our conclusions are sensitive to the confidence of respondents in their answers, we re-estimate our model for a subsample excluding the respondents who report that they are uncertain about their answers. After having answered the four vignette questions, respondents are asked how certain they are of their answers on a 5 points scale ranging from 1 ('very uncertain') to 5 ('very certain'). A quarter of the respondents respond 1 or 2 to this question indicating that they are 'very uncertain' or 'uncertain' about their answers. The coefficient point estimates remain similar after dropping these respondents from the sample (columns 1 and 2 of Table 6). Standard errors of the estimated coefficients however become larger as a consequence of the reduced number of observations.

In the discussion of the sample characteristics, we noted that young respondents seem to be underrepresented. This is a known feature in survey research in general and surveys about pensions in particular. Retirement is a distant concept for younger individuals who as a result do not think much about retirement (Van Rooij et al. 2011). To investigate the sensitivity of our findings across age groups, we divide our sample in younger respondents (50 years or less) and older respondents (above 50 years). Our hypothesis is that younger respondents are more dependent on their peers. Because retirement is still far away young workers may have more difficulties to imagine making retirement decisions and are less likely to have spent time or money to get informed about pensions.

The estimation results for the younger and older subsamples reported in columns 3 and 4 of Table 6 indeed reveal differences across the younger and older

¹⁸ In addition, 33% of respondents increase the retirement age from 64 to 65 and are, thereby, exactly matching the increase in retirement age of coworkers or family and friends. While part of these choices may be due to the anchor effect of 65, these findings suggest that in answering the vignette questions some respondents focus on the incremental change in the retirement age of the social environment and others focus on the level of the social environment's retirement age.

Table 6 Sensitivity checks

Vignette characteristics	Original model (1)	Respondents who are certain of their answers (2)	Respondents younger than or equal to 50 years of age (3)	Respondents older than 50 years of age (4)
Vignette person = female (baseline: male)	-0.02 (0.04)	-0.01 (0.06)	-0.10* (0.06)	0.01 (0.06)
Social environment of vignette person = 'Family and friends' (baseline: coworkers)	-0.12*** (0.04)	-0.08 (0.06)	-0.16*** (0.06)	-0.05 (0.06)
<i>Social environment's reason for working longer (baseline: 'people live longer and healthier lives')</i>				
Reason: 'More need for experienced employees'	0.01 (0.06)	0.05 (0.09)	-0.03 (0.09)	0.07 (0.09)
Reason: 'Financial consequences of the economic crisis'	0.13** (0.06)	0.13 (0.08)	0.19** (0.08)	0.12 (0.09)
Reason: 'Reduction of pension rights by one year'	0.20*** (0.06)	0.25*** (0.09)	0.24*** (0.08)	0.22*** (0.09)
<i>Vignette intercepts (θ_j)</i>				
Vignette 1	0.57*** (0.10)	0.56*** (0.20)	0.73*** (0.13)	0.43*** (0.14)
Vignette 2 – Vignette 1	0.25*** (0.02)	0.23*** (0.02)	0.29*** (0.03)	0.21*** (0.03)
Vignette 3 – Vignette 1	0.19*** (0.02)	0.20*** (0.02)	0.16*** (0.02)	0.22*** (0.03)
Vignette 4 – Vignette 1	0.42*** (0.02)	0.42*** (0.02)	0.39*** (0.02)	0.46*** (0.03)
Respondents' demographic variables	yes	yes	yes	yes
Log likelihood	-4059	-2948	-2064	-1966
Number of respondents	1113	833	578	535

Dependent variable is the number of years increase in the retirement age relative to the initial planned retirement age of the fictive person. Vignette numbers correspond to the numbering in Table 2. The last column restricts all coefficients (for demographic variables and vignette characteristics) across the four vignette questions to be the same, except for the vignette intercepts. The first column with results presents the estimates from the final column in Table 4. Standard errors in parentheses. ***, **, * denote statistical significance at 1, 5 and 10%, respectively

subsamples. First, in particular for younger respondents the retirement decisions of coworkers have a larger impact in retirement preferences than the retirement decisions by family and friends, where for older workers there is no difference between coworkers or family and friends. Second, financial motives seem to matter somewhat more for younger respondents than for older respondents. Third, the average effect of retirement behavior of the social environment is larger for younger individuals. For the baseline respondent, the average impact on the retirement age in vignette 1 is 9 months (0.73×12) in the subsample of young respondents and 5 months (0.43×12) in the subsample of older respondents. The incremental effect calculated from the difference between vignettes 1 and 2 increases from 2 to 3 months for older respondents (0.21×12) to 3–4 months (0.29×12) for younger respondents. Fourth, the difference between the vignette 3 and 1 intercepts suggests that the anchor effect of age 65 is somewhat stronger for older individuals. All in all, the sensitivity analysis suggest that our findings that retirement age preferences are influenced by the decisions of coworkers or family and friends are robust to different sample selections. In addition, this influence is relatively strong for younger individuals.

6 Discussion and Policy Implications

In this study, we have asked respondents directly whether and from whom they receive advice about when to retire and whether this decision may be related to the personal circumstances of other people in their social network. In addition, we have elicited changes in retirement preferences following from changes in the retirement age of the social environment, in particular coworkers or family and friends. The advantage of using vignette questions is that we can vary characteristics of the vignette person to identify the impact of specific conditions, such as the retirement motives of the social environment. In this way, our study deepens the knowledge on the relevance of social interactions for the individual retirement age.

Our results show that social interactions matter for individual retirement age preferences. Individuals receive at least some advice and information on when to retire from their spouse, children, other family, friends, coworkers and their financial advisor or pension fund. In particular, the advice from their spouse and to a lesser extent their children is highly valued. For a large group of respondents, individual preferences on when to retire are partly shaped by the personal situation of the spouse and children and occasionally family or friends.

Vignette experiments show the relevance of retirement behavior of coworkers or family and friends. Respondents would increase their planned retirement age with 3 months in response to an increase of the retirement age of the social environment by 1 year. Note that we do not claim that all respondents would actually change their retirement behavior exactly according to their answers. These are hypothetical questions and there can be many circumstances why respondents retire earlier (bad health, low job satisfaction, losing a job) or later (high job satisfaction, financial need). Nevertheless, a change in preferences is the first step to prepare for a different retirement age. Thus, our findings show that individual retirement preferences are not independent of actions of coworkers or family and friends.

These findings have important policy implications. In particular, the results suggest that once some individuals retire later, there is an additional effect through the social environment of these individuals. This effect could be relatively strong for younger generations, as the influence of coworkers, family, and friends on their retirement preferences is also relatively strong. Moreover, we find that the impact of a change in the social environment's retirement behavior is relatively large when it is a consequence of financial conditions. Consequently, policy reforms strengthening financial incentives for later retirement (such as an increase in the statutory retirement age) may have an additional effect through social interactions.

In addition, the vignette experiments highlight that our respondents seem to some extent to have a preference for the age of 65. An increase in the retirement age of the social environment from 64 to 65 years elicits a two months larger increase in the individual retirement age than a similar increase from 65 to 66 years. This finding points at a special role for the state pension age. The statutory retirement age of 65 of the state pension in the Netherlands has remained unchanged over half a century after its introduction in 1957, and may have developed into a reference point or a social norm.

If such social norms develop slowly, the current Dutch reform with a gradually increasing statutory retirement age may have a long-term effect exceeding the immediate effect (a social multiplier in terms of Glaeser et al. 2003). The immediate effect is related to the financial incentives of the pension reform and a direct effect of changing the reference point of 65. Next, there is an effect associated with the adaptations of individuals' retirement preferences in response to the retirement behavior of the social environment (social embeddedness). And, finally, there may be a long-run effect associated with the development of an implicit social norm or reference point for retirement behavior that has been in place for a long time related to the age of 65. Our results suggest that in addition to 'advice' of the social environment and social embeddedness, social norms likely also play a role when it comes to retirement decision-making.

The sensitivity of the individual retirement age to the retirement age of the social environment can be explained in different ways. A first explanation is that the decision to retire is complex, and that it is typically taken only once in a lifetime. Individuals learn from other people, both by observing their behavior and from their advice. In other words, the social environment provides information about suitable retirement ages. Our study indeed finds evidence that advice from the social environment plays a role in shaping preferences for the retirement age. A second explanation is that individuals have a preference for conforming to the retirement behavior of their social environment. This would be especially relevant if the initially planned retirement age of individuals does not differ a lot from the retirement age of the social environment. In this case social interactions reveal something about the prevailing retirement age norm. The latter explanation suggest that individuals want to mimic or conform to some extent the retirement age of their social environment. Note that this urge to conform to the retirement age of the environment is likely to vary between respondents, similar to the variation we have documented in the sensitivity to advice from the social network. One hypothesis is that those who are open

Table 7 Sensitivity: additional sample splits

Vignette characteristics	Original model (1)	Respondents who do not receive/value advice from coworkers (2)	Respondents who value advice from coworkers (3)	Respondents who do not receive/value advice from fam- ily/friends (4)	Respondents who value advice from family/ friends (5)
Vignette person = female (base- line: male)	-0.02 (0.04)	-0.01 (0.07)	-0.01 (0.05)	-0.09 (0.07)	0.00 (0.06)
Social environment of vignette person = 'Family and friends' (baseline: coworkers)	-0.12*** (0.04)	-0.15** (0.07)	-0.09 (0.06)	-0.13* (0.07)	-0.10* (0.06)
<i>Social environment's reason for working longer (baseline: 'people live longer and healthier lives')</i>					
Reason: 'More need for expe- rienced employees'	0.01 (0.06)	0.01 (0.10)	-0.02 (0.08)	0.08 (0.10)	-0.04 (0.08)
Reason: 'Financial conse- quences of the economic crisis'	0.13** (0.06)	0.21** (0.09)	0.08 (0.08)	0.19** (0.09)	0.14* (0.08)
Reason: 'Reduction of pension rights by one year'	0.20*** (0.06)	0.17* (0.09)	0.27*** (0.08)	0.26** (0.10)	0.15** (0.08)
<i>Vignette intercepts (θ_j)</i>					
Vignette 1	0.57*** (0.10)	0.44*** (0.16)	0.68*** (0.15)	0.42*** (0.17)	0.59*** (0.15)
Vignette 2 – Vignette 1	0.25*** (0.02)	0.16*** (0.03)	0.32*** (0.03)	0.17*** (0.03)	0.30*** (0.02)
Vignette 3 – Vignette 1	0.19*** (0.02)	0.20*** (0.02)	0.18*** (0.02)	0.21*** (0.03)	0.18*** (0.02)
Vignette 4 – Vignette 1	0.42*** (0.02)	0.39*** (0.03)	0.45*** (0.02)	0.42*** (0.03)	0.42*** (0.02)
Respondents' demographic variables	Yes	Yes	Yes	Yes	Yes

Table 7 (continued)

Vignette characteristics	Original model (1)	Respondents who do not receive/value advice from coworkers (2)	Respondents who value advice from coworkers (3)	Respondents who do not receive/value advice from fam- ily/friends (4)	Respondents who value advice from family/ friends (5)
Log likelihood	-4059	-1717	-2306	-1532	-2501
Number of respondents	1113	477	636	420	693

Dependent variable is the number of years increase in the retirement age relative to the initial planned retirement age of the fictive person. Vignette numbers correspond to the numbering in Table 2. The last column restricts all coefficients (for demographic variables and vignette characteristics) across the four vignette questions to be the same, except for the vignette intercepts. Standard errors in parentheses. ***, **, * denote statistical significance at 1, 5 and 10%, respectively

to direct advice from their social network apparently have not definitively made their mind up and are also open to other mechanisms that help them make their decision.

To explore this hypothesis, we investigate whether respondents who have stated that they attach much weight to the advice from for example coworkers or family and friends are more likely to follow the retirement age of the social environment in the vignette questions. For this purpose, we split the sample in two different ways using information from the descriptive analysis in Sect. 4.1. First, we split the sample in those who value the advice given by coworkers (conditional on receiving advice) and those who do not value this advice (or do not expect to receive advice from coworkers). Second, we make a similar split of the sample depending on whether respondents state to value advice given by family or friends (combining these two categories from the descriptive analysis). Table 7 reports the estimation results of our preferred model for the full sample (column 1) and the subsamples (columns 2–5). Based on vignette 1, baseline respondents who value advice raise their retirement age on average by 7–8 months ($0.59*12$ and $0.68*12$) compared to 5 months for those who do not value advice ($0.42*12$ and $0.44*12$). Isolating the effect due to a 1 year increase in the retirement age of the social environment, given by the difference between the first two vignette intercepts, shows an average increase in retirement age equal to 4 months ($0.30*12$ and $0.32*12$) for respondents who value retirement advice from coworkers or family and friends versus 2 months ($0.16*12$ and $0.17*12$) for respondents who do not value such advice.

7 Concluding Remarks

The literature on the timing of retirement shows that the retirement age is determined by both financial and non-financial factors (Van Erp et al. 2014). We investigate the role of non-financial determinants. We find that social interactions play a meaningful role in the formation of retirement age preferences.

The social network has a role as provider of advice as well as setting an example that provides reference points with their retirement decisions. As an advisor, there is in particular an important role for the spouse and children, who probably know the respondent best and are most familiar with their situation. Similarly, respondents may take the situation of the spouse and children into account, when timing the decision to enter retirement. This suggests that the retirement decision is not only determined by personal financial considerations, but could also be driven by the financial situation of close relatives or how the extended leisure time in retirement can be spent. Our research does not provide information to further investigate or discriminate between those reasons, which future research could shed light on.

While our results are based upon stated preferences rather than actual data, they confirm the role of coworkers' decisions in a pool of teachers at a US university (Brown and Laschever 2012). In fact, our results extend these findings to a broad nationally representative population of workers. As has been argued in the previous section, social norms likely play a role here. Using a diff-in-diff approach, we estimate that workers extend their preferred retirement age with 3 months once many coworkers extend retirement by a year. These 3 months are an average and hide

heterogeneity between workers who do not change their preferred retirement age at all and workers who extend their retirement age with a full year as well. Note that the 3 month increase is a sizeable effect, when compared to the 6 months increase in average retirement age found in response to the 1 year increase in the NRA in the US (Mastrobuoni 2009). Moreover, our results also have implications for the current increase in the statutory retirement age, as witnessed not only in the Netherlands, but in many countries worldwide. As this increase induces workers to retire later because of financial reasons or because the statutory retirement age serves as a natural reference point, these decisions will induce other workers to think about retiring later as well. This way, the longer term effect of raising the statutory retirement age will likely exceed the short term effect.

Finally, we find that workers who are looking for advice and value it more than others are also more sensitive to the retirement decisions of other individuals. Retirement decisions of other individuals thus serve as an example or a source of information for particularly those workers who are still uncertain about their retirement plans.

A possible concern is that our findings are based on hypothetical questions and self-assessments. However, previous research has documented evidence of hypothetical questions and self-assessments with high predictive value for actual behavior. For instance, Sahm et al. (2010) find for a large majority of respondents a close correspondence between intended spending out of a US tax rebate and actual spending after the rebate was materialized. As another example, Hurd et al. (2004) document that self-assessed longevity as reported in surveys predicts actual decisions when to claim Social Security in the US. While acknowledging that retirement age preferences may differ from ultimate retirement choices, this gives comfort that our findings are relevant for deepening our insight into the role of non-financial determinants additional to financial determinants. In particular, as it regards the contribution of interactions with the social network in shaping retirement age preferences.

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Appendix 1: Sample Statistics

See Table 8

Table 8 Sample statistics

Explanatory variable	Full sample	Estima- tion sample
Female	44.6	49.3
<i>Age</i>		
16–39 years	14.5	21.3
40–54 years	28.3	44.9
55–64 years	25.8	33.8
≥ 65 years	31.4	–
<i>Education</i>		
Low	27.4	22.6
Intermediate	33.5	35.9
High	39.2	41.5
<i>Net household income per month</i>		
Less than €2000	27.1	24.8
Between €2000 and €3500	47.3	46.5
More than €3500	25.6	28.7
<i>Net personal income per month</i>		
Less than < €1000	28.4	28.0
Between €1000 and €2000	39.8	41.8
More than €2000	31.8	30.2
<i>Employment status</i>		
Employed currently	51.7	81.0
No paid job now (but has worked in the past)	12.3	19.0
Retired	33.5	–
Has never worked	2.6	–
Home owner	73.4	74.8
Has partner	74.2	73.3
Has kids (living at home)	29.2	44.2
Has 3 literacy questions correct	44.0	45.9
Number of observations	1845	1113

Percentages of respondents. All explanatory variables are 0–1 dummies. High education indicates that the respondent has completed a higher vocational training or university. Intermediate education indicates that the respondents has completed intermediate vocational training or preparatory university training but not higher. Low education indicates that the respondents has completed no more than primary school or preparatory vocational training. The three literacy questions measure knowledge of interest rates, inflation and diversification (taken from Lusardi and Mitchell 2011). Percentages may not sum up to 100 due to rounding

Appendix 2: Survey Questions

Note that the order of the four vignette questions in this survey have been randomized among respondents. Before the survey questions start, respondents see an introductory text saying: “The timing of your retirement age is an important decision in the course of your life. Various factors influence this decision. In this part of the survey, we will ask you questions the role of your social environment in your retirement decision”. After this text, the respondents receive the following questions:

Q1) Which of the following persons do you expect to give you advice about when to retire?

Not at all Somewhat Certainly

Spouse
Children
Friends
Family
Coworkers
Neighbors
Financial advisor / pension fund

(For categories where the response to Q1 is ‘somewhat’ or ‘certainly’)

Q2) In the previous question we asked you which persons you think will provide you with advice. What weight do you attach to the advice of the following persons?

None A little Much A great deal

Spouse
Children
Friends
Family
Coworkers
Neighbors
Financial advisor / pension fund

Q3) For which of the following persons do you take the personal situation into account for you decision when to retire?

Not at all A little Much A great deal

Spouse
Children
Friends
Family
Coworkers
Neighbors

Introduction

Nowadays, policy makers discuss a new retirement scheme. Current plans provide the possibility to decide when to start receiving pension entitlements (state as well as employer pension). If you have worked forty years and retire at the standard retirement age, total pension entitlements (including state pensions) equal 70 % of average gross income. The standard retirement age now equals 65 years. Retiring a year before the standard retirement age entails an approximately 7 % lower monthly pension benefit for the remainder of your life. Retiring a year after the standard retirement age entails an approximately 7 % higher monthly pension benefit for the remainder of your life.

We now would like to ask you questions about a fictive person.

Vignette 1

Q4) John (Lisa) is not yet eligible for retirement. He (She) does think about it from time to time. John (Lisa) plans to retire at age 65 considering this retirement scheme. At this time most of his (her) older coworkers (family and friends) retire at age 65. When John (Lisa) turns 60 years old, most coworkers (family and friends) retire at age 66. This is a consequence of people experiencing longer and healthier lives. (This is a consequence of a larger need for experienced employees by employers. / This is due to financial consequences of the economic crisis. / This is a consequence of an increase in the standard retirement age in the pension scheme by one year. If John (Lisa) wants to retire at the same age, he (she) will receive 7 % lower retirement benefits for the rest of his (her) life.)

What would you do in the situation of John (Lisa)?

- 1 Retire before 65
- 2 Retire at 65
- 3 Retire at 65.5
- 4 Retire at 66
- 5 Retire at 66.5
- 6 Retire at 67
- 7 Retire later than 67

Vignette 2

Q5) Arnold (Marlous) is not yet eligible for retirement. He (She) does think about it from time to time. Arnold (Marlous) plans to retire at age 65 considering this retirement scheme. At this time most of his (her) older coworkers (family and friends) retire at age 65. When Arnold (Marlous) turns 60 years old, most coworkers (family and friends) retire at age 67. This is a consequence of people experiencing longer and healthier lives. (This is a consequence of a larger need for experienced employees by employers. / This is a due to financial consequences of the economic crisis. / This is a consequence of an increase in the standard retirement age in the pension scheme by one year. If Arnold (Marlous) wants to retire at the same age, he (she) will receive 7 % lower retirement benefits for the rest of his (her) life.)

What would you do in the situation of Arnold (Marlous)?

- 1 Retire before 65
- 2 Retire at 65
- 3 Retire at 65.5
- 4 Retire at 66
- 5 Retire at 66.5
- 6 Retire at 67
- 7 Retire later than 67

Vignette 3

Q6) Frans (Rachel) is not yet eligible for retirement. He (She) does think about it from time to time. Frans (Rachel) plans to retire at age 64 considering this retirement scheme. At this time most of his (her) older coworkers (family and friends) retire at age 64. When Frans (Rachel) turns 60 years old, most coworkers (family and friends) retire at age 65. This is a consequence of people experiencing longer and healthier lives. (This is a consequence of a larger need for experienced employees by employers. / This is due to financial consequences of the economic crisis. / This is a consequence of an increase in the standard retirement age in the pension scheme by one year. If Frans (Rachel) wants to retire at the same age, he (she) will receive 7 % lower retirement benefits for the rest of his (her) life.)

What would you do in the situation of Frans (Rachel)?

- 1 Retire before 64
- 2 Retire at 64
- 3 Retire at 64.5
- 4 Retire at 65
- 5 Retire at 65.5
- 6 Retire at 66
- 7 Retire later than 66

Vignette 4

Q7) Wim (Els) is not yet eligible for retirement. He (She) does think about it from time to time. Wim (Els) plans to retire at age 64 considering this retirement scheme. At this time most of his (her) older coworkers (family and friends) retire at age 65. When Wim (Els) turns 60 years old, most coworkers (family and friends) retire at age 66. This is a consequence of people experiencing longer and healthier lives. (This is a consequence of a larger need for experienced employees by employers. / This is due to financial consequences of the economic crisis. / This is a consequence of an increase in the standard retirement age in the pension scheme by one year. If Wim (Els) wants to retire at the same age, he (she) will receive 7 % lower retirement benefits for the rest of his (her) life.)

What would you do in the situation of Wim (Els)?

- 1 Retire before 64
- 2 Retire at 64
- 3 Retire at 64.5
- 4 Retire at 65
- 5 Retire at 65.5
- 6 Retire at 66
- 7 Retire later than 66

Q8) How sure are you of your answers to the previous questions?

- 1 Very uncertain
- 2
- 3
- 4
- 5 Very certain

Q9) Imagine you have €100 in a savings account and the interest rate is 2% per year. After 5 years, how much do you think you would have in the account if you left the money to grow?

- 1 More than €102
- 2 Exactly €102
- 3 Less than €102
- 4 Do not know
- 5 Refusal

Q10) Imagine that the interest rate on your savings account is 1% per year and inflation is 2% per year. After 1 year, how much would you be able to buy with the money in this account?

- 1 More than today
- 2 Exactly the same
- 3 Less than today
- 4 Do not know
- 5 Refusal

Q11) Do you think that the following statement is true or false? Buying a company stock usually provides a safer return than a stock mutual fund.

- 1 True
- 2 False
- 3 Do not know
- 4 Refusal

Appendix 3: Regression analysis on the role of network's advice and personal situation

See Tables 9, 10 and 11.

Table 9 Multivariate probit regression of who gives advice on respondent's personal characteristics

	Spouse	Children	Friends	Family	Coworkers	Neighbors	Financial advisor
Female	-0.00 (0.03)	0.03 (0.02)	-0.00 (0.02)	0.02 (0.02)	0.00 (0.02)	0.00 (0.00)	-0.02 (0.02)
<i>Age (baseline: ≤ 39 years)</i>							
Age: 40–54 years	-0.17*** (0.04)	-0.12*** (0.02)	-0.04** (0.02)	-0.07*** (0.02)	0.02 (0.02)	-0.00 (0.00)	-0.01 (0.03)
Age: 55–64 years	-0.23*** (0.05)	-0.10*** (0.02)	-0.05*** (0.02)	-0.09*** (0.02)	-0.04 (0.03)	-0.00 (0.00)	0.01 (0.03)
<i>Education (baseline: low)</i>							
Education: intermediate	0.08** (0.04)	0.06* (0.03)	0.04 (0.03)	0.01 (0.02)	0.03 (0.03)	0.00 (0.00)	0.04 (0.03)
Education: high	0.13*** (0.04)	0.06** (0.03)	0.06** (0.03)	0.01 (0.02)	0.04 (0.03)	-0.00 (0.00)	0.01 (0.03)
<i>Net household income (baseline: < €2000)</i>							
Income: [€2000–€3500]	0.11*** (0.04)	0.04 (0.03)	0.06** (0.02)	0.02 (0.02)	0.06** (0.03)	-0.00 (0.00)	0.05 (0.03)
Income: ≥ €3500	0.17*** (0.05)	0.03 (0.04)	0.06 (0.04)	0.00 (0.03)	0.07* (0.04)	0.00 (0.00)	0.05 (0.05)
<i>Net personal income (baseline: < €1000)</i>							
Income: [€1000–€2000]	-0.08* (0.04)	-0.03 (0.03)	-0.01 (0.02)	0.00 (0.02)	0.01 (0.03)	0.01 (0.01)	0.06* (0.03)
Income: ≥ €2000	-0.17*** (0.06)	-0.08*** (0.03)	-0.03 (0.02)	-0.01 (0.02)	-0.01 (0.03)	0.00 (0.01)	-0.01 (0.04)
No paid job now	0.07 (0.04)	0.01 (0.03)	-0.01 (0.02)	-0.02 (0.02)	-0.05*** (0.02)	0.00 (0.00)	-0.05* (0.03)
Home owner	0.09** (0.04)	0.04 (0.03)	0.02 (0.02)	0.03 (0.02)	-0.01 (0.03)	0.00 (0.00)	0.04 (0.03)

Table 9 (continued)

	Spouse	Children	Friends	Family	Coworkers	Neighbors	Financial advisor
Has partner	0.33*** (0.05)	-0.04 (0.04)	-0.08** (0.03)	-0.03 (0.03)	-0.05 (0.03)	-0.01 (0.01)	-0.06 (0.04)
Has kids	-0.01 (0.04)	0.14*** (0.03)	0.03 (0.02)	-0.00 (0.02)	0.01 (0.02)	0.01** (0.00)	-0.00 (0.03)
Has 3 literacy questions correct	0.06* (0.03)	0.00 (0.02)	0.00 (0.02)	0.00 (0.02)	0.00 (0.02)	-0.00 (0.00)	0.02 (0.02)
Number of respondents	1113	1113	1113	1113	1113	1113	1113
Log likelihood	-625	-433	-305	-291	-387	-37.5	-475

The table reports marginal effects. Standard errors in parentheses. ***, **, * denote statistical significance at 1, 5 and 10%, respectively

Table 10 Multivariate probit regression of weight of advice on respondent's personal characteristics

	Spouse	Children	Friends	Family	Coworkers	Neighbors	Financial advisor
Female	0.04* (0.02)	0.14*** (0.05)	0.04 (0.04)	0.10** (0.04)	0.01 (0.04)	0.03 (0.08)	0.07* (0.04)
<i>Age (baseline: ≤ 39 years)</i>							
Age: 40–54 years	0.01 (0.02)	−0.06 (0.05)	−0.01 (0.05)	−0.08 (0.05)	0.11** (0.05)	−0.10 (0.08)	0.02 (0.05)
Age: 55–64 years	−0.03 (0.03)	−0.08 (0.06)	−0.11* (0.06)	−0.21*** (0.05)	0.05 (0.06)	−0.13** (0.05)	0.05 (0.06)
<i>Education (baseline: low)</i>							
Education: intermediate	0.03 (0.02)	−0.01 (0.06)	−0.06 (0.06)	−0.04 (0.06)	0.04 (0.05)	−0.06 (0.08)	0.13** (0.05)
Education: high	0.04 (0.02)	−0.03 (0.06)	0.06 (0.06)	−0.11* (0.07)	0.07 (0.05)	−0.07 (0.07)	0.10* (0.05)
<i>Net household income (baseline: < €2000)</i>							
Income: [€2000–€3500)	−0.01 (0.03)	0.00 (0.06)	0.06 (0.06)	0.10* (0.06)	0.00 (0.05)	0.11 (0.08)	−0.03 (0.06)
Income: ≥ €3500	−0.03 (0.03)	−0.01 (0.07)	−0.01 (0.07)	0.05 (0.08)	−0.01 (0.07)	0.21 (0.15)	0.01 (0.07)
<i>Net personal income (baseline: < €1000)</i>							
Income: [€1000–€2000)	0.01 (0.02)	0.09* (0.05)	0.06 (0.05)	0.05 (0.05)	0.05 (0.05)	0.07 (0.09)	0.03 (0.05)
Income: ≥ €2000	−0.00 (0.03)	0.05 (0.07)	−0.04 (0.07)	−0.07 (0.07)	0.12* (0.07)		0.01 (0.07)
No paid job now	−0.01 (0.02)	−0.03 (0.05)	0.01 (0.06)	−0.10* (0.05)	0.01 (0.05)	0.10 (0.11)	−0.02 (0.06)
Home owner	0.02 (0.02)	0.05 (0.06)	0.01 (0.06)	0.04 (0.06)	−0.09* (0.05)	−0.20 (0.14)	−0.02 (0.05)
Has partner	0.05 (0.04)	0.08 (0.06)	−0.02 (0.06)	−0.09 (0.07)	−0.01 (0.06)	0.10 (0.07)	0.01 (0.06)
Has kids	−0.01 (0.02)	0.04 (0.05)	−0.04 (0.05)	−0.06 (0.05)	0.02 (0.05)	0.07 (0.09)	−0.01 (0.05)
Has 3 literacy questions correct	0.02	0.03	−0.09**	−0.08*	−0.07*	−0.12**	0.01
Number of respondents	951	628	616	586	668	83	665
Log likelihood	−250	−397	−401	−356	−403	−29.3	−443

The table reports marginal effects. Standard errors in parentheses. ***, **, * denote statistical significance at 1, 5 and 10%, respectively

Table 11 Multivariate probit regression of taking account of personal situation of others

	Spouse	Children	Friends	Family	Coworkers	Neighbors
Female	−0.02 (0.03)	0.05 (0.03)	0.01 (0.02)	0.02 (0.02)	−0.03* (0.02)	−0.00 (0.01)
<i>Age (baseline: ≤ 39 years)</i>						
Age: 40–54 years	−0.16*** (0.04)	−0.12*** (0.04)	−0.01 (0.02)	−0.05** (0.02)	0.02 (0.03)	−0.01 (0.01)
Age: 55–64 years	−0.26*** (0.05)	−0.10** (0.04)	−0.04* (0.02)	−0.10*** (0.02)	0.00 (0.03)	−0.00 (0.01)
<i>Education (baseline: low)</i>						
Education: intermediate	0.03 (0.04)	0.01 (0.04)	0.02 (0.03)	0.02 (0.02)	0.05* (0.03)	0.01 (0.01)
Education: high	0.04 (0.04)	−0.05 (0.04)	0.03 (0.03)	−0.02 (0.02)	0.05* (0.03)	0.00 (0.01)
<i>Net household income (baseline: < €2000)</i>						
Income: [€2000–€3500)	0.11*** (0.04)	0.05 (0.04)	0.04* (0.03)	0.03 (0.02)	0.06** (0.03)	0.01 (0.01)
Income: ≥ €3500	0.15*** (0.04)	0.07 (0.05)	0.05 (0.04)	0.03 (0.03)	0.06 (0.04)	0.01 (0.01)
<i>Net personal income (baseline: < €1000)</i>						
Income: [€1000–€2000)	−0.10*** (0.04)	−0.02 (0.04)	−0.03 (0.02)	−0.02 (0.02)	0.00 (0.02)	−0.01 (0.01)
Income: ≥ €2000	−0.14** (0.06)	−0.08 (0.05)	−0.06*** (0.02)	−0.03 (0.03)	−0.05** (0.03)	−0.02** (0.01)
No paid job now	−0.03 (0.04)	0.02 (0.04)	−0.04** (0.02)	−0.04** (0.02)	0.01 (0.02)	−0.00 (0.01)
Home owner	0.02 (0.04)	0.07 (0.04)	0.04** (0.02)	0.04* (0.02)	0.02 (0.02)	0.00 (0.01)
Has partner	0.37*** (0.04)	−0.02 (0.05)	−0.05 (0.03)	−0.06** (0.03)	−0.04 (0.03)	0.01 (0.01)
Has kids	−0.03 (0.03)	0.23*** (0.04)	−0.00 (0.02)	−0.05** (0.02)	−0.02 (0.02)	0.00 (0.01)
Has 3 literacy questions correct	0.04 (0.03)	−0.00 (0.03)	−0.03 (0.02)	−0.02 (0.02)	−0.06*** (0.02)	−0.01 (0.01)
Number of respondents	1113	1113	1113	1113	1113	1113
Log likelihood	−550	−679	−334	−335	−340	−95.0

The table reports marginal effects. Standard errors in parentheses. ***, **, * denote statistical significance at 1, 5 and 10%, respectively

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