

Social connectedness and the transition from work to retirement.

A panel study.

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Objectives. While there are numerous studies on the role of social capital in early working life, there is virtually no research that examines how social connections matter at later stages of the career. The present study analyses to what extent social connectedness affects the transition from work to retirement.

Methods. We draw on data from the German Socio-Economic Panel Study (GSOEP) from the years 1985-2009 and apply techniques of event history analysis. Social connectedness includes meeting with, friends, family and neighbors, as well as being engaged in voluntary associations and local politics.

Results. The presented findings demonstrate that social connectedness matters for the transition from work to retirement. Whereas intensive contact with family and friends results in earlier retirement, civic engagement delays labor force withdrawal.

Discussion. There is no univocal effect of social connectedness. Rather, the provided evidence indicates that the relationship between informal social participation and work in later life is characterized by substitution, but formal participation is complementary to labor market participation: while connections in private life speed up exit from work, civic and voluntary participation is associated with postponed retirement.

Key words: social connectedness, retirement, life-course, Germany, longitudinal analyses.

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INTRODUCTION

People's social networks have an impact on their working life. The manifold effects of social capital upon entry to and performance on the labor market are well documented (see, for an overview Lin 1999; Mouw 2003). While there are numerous studies on the role of social capital in the early working life, it is largely unknown whether social connections also matter at later stages of the career. As Burr et al. (2003: 274) say, "the field needs a better understanding of how older people use their time and what factors drive these choices".

Previous studies predominantly have examined how people's networks develop *after* retirement (Cornwell, Laumann, and Schumm 2008; Hank and Stuck 2008; Mutchler, Burr, and Caro 2003). For example, Cornwell et al. (2008) show that under ceteris paribus conditions social connectedness is higher for retired persons than among workers. There is also evidence that network sizes decrease with age (Kohli and Künemund 2010) or bad health (Van Tilburg and Van Groenou 2002). From a comparative perspective, Kohli et al. (2009) demonstrate that while there are important cross-national differences in social relations, the individual-level determinants of older people's networks are very similar across countries. So far, however, there is virtually no research that examines how social connectedness influences the process of labor force withdrawal.

In fact, in the literature on early retirement, social networks hardly play a role. Previous research has concentrated on the design of pension systems (Gruber and Wise 2004) and labor market institutions (Ebbinghaus 2006). At the micro level, the timing of retirement has been shown to depend, among other characteristics, on education, social class and gender (Blossfeld, Buchholz, and Kurz forthcoming). However, there is lack of evidence concerning the effect of social connectedness. The only dimension of social relations that has been studied systematically with respect to its consequences for the retirement process are intra-household relations, and particularly the interdependence of retirement decisions between spouses (Drobnič 2002; Moen, Sweet, and Swisher 2005; Henkens 1999).

In this paper, we analyze whether social connections beyond the household also matter for the timing of retirement. More specifically, we consider two contrasting theoretical approaches to productive activities and social contacts. On the one hand, the retirement decision poses a fundamental trade-off between work and leisure time. People with many social connections are likely to have a strong leisure orientation, because it enables them to spend time with friends and family. From that perspective, social participation should lead to early retirement. A competing hypothesis claims that well-connected persons retire later, because social connectedness and work attachment are manifestations of a common underlying motivation to participate in social life. Along this line of argumentation, social participation delays retirement, because actors aim to avoid being cut off from the social life they value.

The contribution of this paper to the field is hence to shed light on the effects of formal and informal participation on the timing of retirement. The empirical analyses are based on the German Socio-Economic Panel Survey (1985-2009), which includes detailed longitudinal information on the life-course and a bi-yearly measure of social connectedness. Panel data on social participation are hard to come by, and have been rarely used in previous studies on the topic. Taking account of the temporal ordering of the processes involved, this study overcomes some of the common methodological problems in the field, as is reversed causality. We employ event history techniques to study the question as to how social connectedness affects the process of labor market withdrawal, which also has important implications for the economic sustainability of the ‘active aging’ paradigm.

Social Connectedness

Studies on aging have recently adopted a more network-oriented approach to assess the social integration of older adults (Kohli, Hank, and Künemund 2009). Although varying in its terminology, to conceptualize social connectedness, most studies follow the distinction between informal and formal connections that is also common practice in other studies on social capital

(Pichler and Wallace 2007). *Informal* connections refer to assisting neighbors, friends, and family (Mutchler, Burr, and Caro 2003), getting together with neighbors, people with whom you discuss things that were important to you (Cornwell et al. 2008) and the social interaction with friends, neighbors, colleagues or acquaintances (Kohli, Hank, and Künemund 2009). Conversely, *formal* participation refers to organizational group involvement, volunteer work (Cornwell, Laumann, and Schumm 2008; Mutchler, Burr, and Caro 2003), and participation in associations, clubs or other formal organizations (Kohli, Hank, and Künemund 2009).

In this study, we use longitudinal data on informal as well as formal participation. Unlike virtually all previous studies, we are able to observe the social connectedness of older workers for a long time span (up to 25 years), and relate it to their retirement behavior. Informal participation refers to meeting with friends, neighbors and relatives, formal participation to activities in voluntary associations, neighborhood organizations and local politics (see also section measurement). Although relationships with co-workers are part of people's social networks as well (Tilburg 2003), our focus is on social connectedness outside of the workplace.

Retirement in Social Networks Research

Numerous research contributions have studied the impact of social capital on labor market activity (see for example Mouw 2003; Granovetter 1995; Lin 1999). However, no studies have been conducted to examine the way in which social networks influence retirement processes. There exists, however, a small body of literature that looks, reversely, at the effect of retirement on social networks (Cornwell, Laumann, and Schumm 2008; Tilburg 2003). Social networks usually become smaller in older age groups (Kohli and Künemund 2010). Yet, in contrast to common knowledge, retirement as such is not the reason for decreasing numbers of personal relationships (Cornwell, Laumann, and Schumm 2008). Rather, retirement typically goes along with a change in the network composition, as coworker relationships are replaced by family relationships (Tilburg 2003). There are also effects of retirement on cultural consumption (Scherger 2009).

Although all these findings are valuable as descriptive accounts of older people's social contacts, they do not provide a causal assessment of the retirement-network nexus. Kohli and Kunemund (2010: 158) state that 'while cross-sectional associations between the dimensions of network structures and participation and their antecedents and consequences can yield more or less plausible interpretations, reliable knowledge about trends (age-period-cohort matrix) and about causal processes presupposes longitudinal data'. Critically, retirement status may well be endogenous to social connectedness. There is some tentative evidence to support this view: for instance, having a larger number of retirees in one's social network is associated with a preference for early exit from work among married Dutch workers (Henkens 1999).

The Relation between Social Connectedness and Retirement

The activity-substitution hypothesis.—Retirement can be interpreted as an inter-temporal optimization problem that is based on a trade-off between leisure and consumption (Gruber and Wise 2004). Within this framework, individual preferences, particularly the value placed upon work versus non-work activities, will guide the retirement decision. To the extent that social connectedness alters the desire for leisure, extensive networks can be expected to lead to diminished labor supply. Workers who are rich in social resources are likely to value private life relatively more than workers who have few social resources. Previous research has shown that social connectedness among older people is associated with better quality of life (Siegrist and Wahrendorf 2009) and self-reported health (Sirven and Debrand 2008). Analogously, social networks should also influence work-leisure orientations that enter the process of decision-making regarding the timing of retirement. Hence, the socially well-connected worker can be expected to exit the labor market earlier than the socially less-connected worker.

A second argument underlying the activity-substitution hypothesis is rooted in role theory (Hank and Stuck 2008). As Mutchler et al. (2003) set out, role overload theory suggests that people who are not in paid work will participate more extensively in volunteering than do others.

Both in response to role loss and as a function of increased time availability, volunteer activity may increase following exit from the paid labor force. From a social exchange perspective (Siegrist 2000), core social roles, such as work, family, and civic responsibilities are prerequisites for fulfilling self-regulatory needs. According to Siegrist (2000), these roles provide opportunities to contribute and perform (self-efficacy), to belong (identity), and to be recognized and rewarded (self-esteem). In lack of social exchange, it is more difficult to meet these self-regulatory needs.

In this view, people with few social connections may anticipate potential role loss following withdrawal from work, and hence prefer to retire later. For example, Szinovacz et al. (2001: 21) argue that “individuals lacking salient family ties may be less inclined to retire anticipating that withdrawal from the labor force will curtail opportunities for social and personal fulfillment”. In a similar vein, well-connected people are likely to leave the labor market earlier, because they can substitute paid employment for social activities and by that prevent role loss and avoid not meeting self-regulatory needs. Thus, according to the “activity-substitution hypothesis”, social connectedness is associated with early retirement.

The complementarity hypothesis.—Albeit intuitive, the substitution hypothesis has been challenged by contrasting evidence regarding the association between various types of activities in later life (Kohli, Hank, and Künemund 2009; Hank and Stuck 2008). Rather than a trade-off dilemma, the relationship between employment and volunteering has turned out to be cumulative, with voluntary work significantly enhancing labor market opportunities in the long term (Wilson and Musick 2003, 1997).

Continuity theory may help to account for this pattern. As Cornwell et al. (2008: 186) explain, “continuity theory argues that people become accustomed to certain social roles and social activities throughout their lives, which older adults actively attempt to maintain through the many transitions they face.” In other words, this perspective posits a clustering of persons into different time-use arrangements that remain rather stable over the life course (cf. Burr et al. 2007).

Burr and colleagues (2007) analyze the structure of productive activities among middle-aged and older adults in the US. One of the clusters they identify is labeled ‘worker/volunteer’. The authors conclude that civic participation and paid work are complementary, because volunteering may be an extension of employment-related social networks.

As far as the linkage between social connectedness and retirement behavior is concerned, this logic implies a positive association of paid work and other social activities. Accordingly, we expect to observe a polarized picture in late working life, with some persons intensively engaged in paid and unpaid activities and others largely removed from social life outside of the household. Well-connected people retire later because they fear the loss of social contacts that may come along with retirement. Furthermore, social connectedness delays labor market withdrawal because those that are active socially are also active in other life domains. The “complementarity hypothesis” thus posits a positive association between paid work and social connectedness (Mutchler, Burr, and Caro 2003: 1271-1272).

To sum up, the relationship between connectedness and retirement can be approached from two different perspectives. On the one hand, social connections like meeting with friends, may be associated with leisure rather than with work and hence trigger a substitution process resulting in earlier retirement for well-connected people. On the other hand, to the extent that social connectedness and work attachment are both driven by a general predisposition to participate in social life, the two kinds of activities are likely to be complementary.

Following the activity-substitution hypothesis, we expect that

H1 People who are socially well-connected retire *earlier* than people who have less frequent social activities.

Following the complementarity hypothesis, we expect that

H2 People who are socially well-connected retire *later* than people who have less frequent social activities.

METHODS

For the empirical analyses, we draw on data from the German Socio-Economic Panel Survey (GSOEP), a panel study with yearly waves since 1984 (Wagner, Burkhauser, and Behringer 1993). As is common in studies on retirement, we restrict the sample to workers 50 years of age or older in order to delimit retirement from other forms of labor market inactivity that frequently occur in earlier phases of the life course. Inclusion criterion is that the individual is working at age 50 or later. Since the measurement of social connectedness in 1984 slightly differs from the subsequent years, our analyses are based on the years 1985-2009.

Method of Estimation

We apply a survival-analytic framework to examine the association between social connectedness and the timing of retirement. For the multivariate analysis we estimate a piecewise-constant exponential model (Cleves, Gould, and Gutierrez 2002). Taking into account the clustering of retirement events at the statutory age boundaries, the baseline hazard uses the following age brackets: 50–54 years, 55–59 years, 60 years, 61–64 years, 65 years, 66–69 years, and older than 70 years. The window of observation is capped at 80 years of age.

The event analyzed is exit from work. Though officially part of the labor force, we treat unemployed persons as retired unless an employment spell follows the period of joblessness. This operationalization is based on the documented difficulty of re-entry for older workers and the heavy use of the unemployment insurance as early retirement pathway in Germany (Knuth and Kalina 2002). The final sample consists of 54,883 person-year entries representing 10,429 subjects, of which 4,575 retire during the observation time.

Measures

Independent variables.—The GSOEP survey is a unique source of longitudinal data on social

participation. Every second year, the GSOEP includes a module on how people spend their free time. Respondents are asked how often they meet with friends, relatives or neighbors, perform volunteer work in clubs or social services, and are involved in a citizens' group, political party or local government (see table 1 for the variable construction and the exact wording of the survey questions). Following previous work on civic engagement (Ruiter and De Graaf 2006), we combine the latter two variables in a single construct (Cronbach's $\alpha=.61$). The frequency of interaction as a measurement instead of, for example, tie strength, is especially suitable for our purpose, because it is precisely the amount of time spent in social activities that poses the trade-off problem between work and leisure time. Naturally, although in line with previous work on the social connectedness of older adults, these items are but a proxy of people's social connections. Overall, we argue that the measures included in this study are a good operationalization of the social connectedness of older people in the private and civic domain.

<Table 1 about here>

Control variables.—To control for composition effects, we include yearly measures of social class (using the well-known Erikson-Goldthorpe schema), net labor income, a dummy for home ownership, work experience (in years), the number of years that people have been unemployed in the past and people's self-perceived health. To account for persistent differences between East and West Germany, we include a dummy for residence in the former German Democratic Republic, for men and women separately. We also include dummies for birth cohorts (in periods of ten years) to control for possible cohort differences.

Furthermore, against the background of previous evidence on spouses' joint retirement planning, we control not only for marital status but also for the employment situation of spouses (married or cohabiting) (Drobnič, 2002; Henkens, 1999). To this aim, we constructed the following categorical variable: Married/cohabiting with employed spouse; married/cohabiting

with inactive spouse; divorced or separated; single; widowed. Similarly, care giving can be an obstacle to continued work, although the empirical evidence on the effect of care obligations is inconsistent thus far (Kim and Moen 2002; Jefferson 2010; Dentinger and Clarkberg 2002; Szinovacz, DeViney, and Davey 2001). Therefore, we include a dummy for those people who have a person living in the household that is older than 70 years. We also control for the number of children.

All variables are time-dependent, i.e. individuals are traced during analysis time and workers' socio-economic profile is updated yearly as they draw closer to their retirement. Table 1 provides an overview of the variable construction; table 2 displays the descriptive statistics for the sample.

<Table 2 about here>

RESULTS

To illustrate the nature of the retirement process as reflected in the panel data at hand, figure 1 shows Kaplan-Meier estimates of the survival curve. It plots different curves for men and women in West and East Germany respectively. While men in West Germany remain employed until relatively late in life, women in the East retire earliest. East German men and West German women are found somewhere in between. Since our data capture the period of the early 1990s, when the job market in the East contracted sharply, this significant regional effect was to be expected. The gender effect is likewise in accordance with existing research (Jabsen and Buchholz forthcoming).

<Figure 1 about here>

In Table 3, we use a semi-parametric event-history model to assess the influence of social connectedness on the transition from work to retirement. The base model (Model 1) contains basic socio-demographic covariates that account for a good share of the observed variance in retirement age. As expected, unemployment history, as well as the number of working years, is positively related with the pace of work-exit transitions. By contrast, good health is related with later withdrawal from work. Social class differentials are consistent with previous research (Jabsen and Buchholz forthcoming). The number of children and the presence of an elderly person do not yield significant effects. In line with previous work (Moen, Sweet, and Swisher 2005), people with a spouse who is not in the labor force retire earlier, when being compared to married persons whose spouse is working.

In model 2, we add our indicators of social connectedness. A higher contact frequency with friends, neighbors and relatives, i.e. informal social participation, leads to anticipated labor market withdrawal. Formal participation in the form of volunteering activities and participating in local politics has the opposite effect: those who are heavily involved in civic life retire later. The magnitude of the effects is substantial: while a change in informal participation from “no contact” to “at least weekly contact” lifts up the pace of retirement by 15.9% (calculated as $3 \times [1.053 - 1] \times 100$), increasing formal participation from minimum to maximum frequency decelerates retirement by 18.3% ($3 \times [0.939 - 1] \times 100$).

To better account for financial retirement incentives, in model 3 we include workers’ net wage and a dichotomous variable for home ownership. While the latter remains insignificant, the negative effect of labor income likely reflects the lower incidence of involuntary exit from work among high-wage earners. In any case, the coefficients and standard errors corresponding to the social participation variables remain largely unaltered.

The model diagnostics carried out reveal that the proportional hazard assumption does not hold for the variables of interest. Therefore, in columns 4 and 5 we proceed to present a set of models that depart from the assumption of constant hazards. In particular, we allow the effects of

formal and informal participation to vary across the intervals of the analysis time (Bernardi 2001). This yields additional insights. Model 4 shows that the effect of formal participation is only significant during workers' fifties and not afterwards. As for informal participation, modeling the effect within time-varying metric shows, on the contrary, that the effect increases with age. While the number of contacts with friends and family does not have any relevance for retirement patterns for workers younger than 60 years of age, after that threshold the effect is even stronger than before.

In model 5, we see that these time-varying patterns are independent of the shape of age-wage curves. Effect sizes are considerable: an increase in informal participation from "no contact" to "at least weekly contact" makes the retirement propensity go up by 36.6% ($3 \times [1.122 - 1] \times 100$); a maximal raise in the frequency of formal participation leads to a decrease in transitions rates by 29.7% ($3 \times [0.901 - 1] \times 100$).

<Table 3 about here>

In figure 2, we use the last estimates (model 5) to plot predicted survival curves for the different cross-combinations of high and low levels of formal and informal participation, respectively. The figure shows that until the age of 60 the only thing that matters is the contrast between high and low formal participation. The respective survival curves diverge: a larger share of people that are engaged in voluntary work remains employed than among those who do not do any volunteering, and this difference increases until the age of 60, irrespective of levels of informal participation. However, from the age of 60 onwards, the graph illustrates that people with high levels of informal participation – who meet their friends, neighbors and relatives at least once a week –, retire at a much higher pace than people with no informal social relations. As a consequence of this pull effect, when approaching age 65 the survival curve for workers with high degrees of formal and informal social connectedness crosses the curve for workers without social

participation of any kind. Furthermore, the two pairs of curves representing a given level of informal participation but different levels of formal participation remain parallel after the age of 59, reflecting the lack of significant effects of volunteering during this late career phase.

<Figure 2 about here>

In summary, we find that the effect of social connectedness on retirement timing depends on the kind of social participation. Whereas informal social connections foster early exit from work (H2), volunteering is associated with delayed retirement (H1).

DISCUSSION

In this paper, we analyzed whether social connectedness affects the transition from work to retirement. Thus far, studies have analyzed how social networks develop after retirement, but there is no longitudinal evidence as to how social connectedness is related to the process of labor market withdrawal. Based on the activity-substitution hypothesis (H1), we expected that social connectedness is associated with early retirement, because well-connected persons value social activities a lot and are therefore more likely to substitute work for leisure. Conversely, based on the complementarity hypothesis (H2) we expected that social connectedness goes hand in hand with delayed retirement because people aim to avoid being cut off from social life as they lose work-related social ties.

Our findings suggest that social connectedness influences the transition from work to retirement. After age 60, the likelihood to exit the labor force is up to 36% higher among workers who frequently meet with friends and family than among workers who do not. At an age between 50 and 59 years, when retirement is often involuntary, this effect was no longer significant. It seems therefore that well-connected older workers indeed deliberately substitute work for leisure time by anticipating a socially rich third age. In this sense, social relations are not only an

important element of “successful aging” (Sirven and Debrand 2008; Siegrist and Wahrendorf 2009) that help with the adjustment to retirement: Friendships and family relations can even lead to anticipated retirement. This is evidence for the high importance of social connections for people’s work-leisure orientations.

On the other hand, we found that formal participation is associated with later retirement, but only among individuals younger than 60. Among workers in their fifties, being active in civic and voluntary associations is associated with almost a 30% reduction in retirement propensities, compared to people who are not involved in formal associations. Since the effect disappears after age 60, when the degree of individual control over retirement timing is higher, we discard a purely choice-based interpretation. In line with the complementarity hypothesis, having many formal social connections rather represents an indicator of self-selection into active aging. While the more engaged people remain attached to their work until late in life, formally less connected persons withdraw from work as soon as they can afford to do so, everything else being equal. In fact, the latter cluster fits the description of social disengagement theory (Cumming and Henry 1961), which stipulates that older adults’ isolation results from a gradual and irreversible abandonment of social roles, narrowing role sets, and the weakening of existing social bonds. Though having lost credibility as a general theory of the aging process (Kohli and Kunemund, 2010), disengagement theory may still be an appropriate description for the less connected older adults, as far as formal participation is concerned. By contrast, for people with high levels of formal participation, work and leisure are not competing activities but closely intertwined. In that respect, remaining employed can be seen as a way of holding on to one’s accustomed social roles.

The finding that volunteering and (self) employment are complementary activities in late working life resonates with the seminal study by Wilson and Musick (2003) on the positive labor market effects of voluntary work. While their analyses focused on early adulthood and midlife, our results suggest that there also labor-market benefits of volunteering among older workers. It could also be speculated that the low risk of anticipated retirement among workers with high

levels of formal participation indicates a reward on behalf of employers who recognize the value of voluntary work.

As Bosse et al. (1993) point out, it proves in this context to separate retirement as a transition from retirement as a state. Otherwise, it could appear contradictory with our results that Hank and Stuck (2008) found retirees to have higher levels of civic engagement than employed people. In synthesis, it is well perceivable and congruent with the complementarity hypothesis that, on the one hand, formal participation is lower for people in the labor force than it is for retirees, while on the other hand among the employed, people who participate intensely in formal organizations retire later than people who do not.

The findings have implications for studies of social connectedness among the retired population. Since social networks affect the timing of retirement, the retirees analyzed in previous studies are a self-selected group. For example, it is found that retirees have higher levels of informal participation (Cornwell et al 2008). However, in view of our findings this is not only because being retired triggers social activities, but at least also partly because these social activities fostered an early transition into retirement to begin with.

The fact that the complementarity hypothesis is supported when it comes to volunteering is good news for policy-makers, in the sense that it indicates the absence of an adverse effect of prolonged employment on unpaid work. Rather than crowding-out, there is crowding-in in the relation between volunteering and employment in later life. Conversely, frequent informal participation in late stages of the career can be interpreted as a prelude to a socially active ‘third age’, that manifests itself in earlier retirement.

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Tables and Figures

Table 1. Variable Coding and Wording of Survey Questions.

	Variable construction	Wording of survey questions / Source
Social connectedness		Respondents are asked "Which of the following activities do you take part in during your free time?"
Informal participation	1-item scale ranging from 0=never to 3= at least once a week.	'Meeting with friends, relatives or neighbors'
Formal participation	2-item scale ranging from 0=never to 3= at least once a week. Alpha =.61	'Volunteer work in clubs, associations or social services', 'Involvement in a citizens' group, political party, local government'
Number of years worked	Continuous variable ranging from 0-80 years working experience (months converted into decimals)..	GSOEP generated variable
Unemployment experience	Continuous variable ranging from 0-35 years unemployment experience (months converted into decimals).	GSOEP generated variable
Satisfaction with health	1-item scale, ranging from 0=totally unhappy to 10= totally happy.	'How satisfied are you with your health?'
Net labor income	Natural logarithm of net labor income in Euros.	"How high was your income from employment last month?"
Number of children	Count variable number of children of respondent and possible partner, ranging from 0-12.	Biography information.
Female	Dummy variable 1=female, 0=male.	Biography information.
East Germany	Dummy variable 1=former east Germany, 0=former west Germany.	Biography information.
Partner status	Categorical variable combining marital status respondent and employment status partner.	- What is your marital status? - Are you currently engaged in paid employment? Which of the following applies best to your status?
(Grand-) Parent 70+ in HH	Dummy variable with 1= In a multigenerational household, one member is older than 70, 0= other.	- Household typology, category multigenerational-household. - Age household members.
Social class	Categorical variable based on EGP class scheme.	What is your current position/occupation? (ISCO-88 occupational codes)
Age groups	Categorical variable containing age groups	Date of birth biographical information and survey year.
Birth cohort	Categorical variable containing 10-year birth cohorts.	Date of birth biographical information

Source: GSOEP-1985-2009.

Table 2. Descriptive Statistics.

	Mean	SD
Informal participation	2.07	0.81
Formal participation	0.65	1.02
Work experience (years)	30.52	8.32
Unemployment experience (years)	0.55	1.72
Satisfaction with health	6.36	2.15
Net labor income (ln)	7.01	0.86
Number of children	1.94	1.28
	Percentage	
Socio-demographics		
Male, West Germany	43	
Male, East Germany	13	
Female, West Germany	33	
Female, East Germany	11	
Foreign born	15	
Family situation		
Married/cohabitating, spouse employed	53	
Married/cohabitating, spouse inactive	32	
Divorced or separated	8	
Single	3	
Widowed	3	
(Grand-) Parent 70+ living in household	1	
Social class (EGP)		
High service	14	
Low service	20	
Routine non-manual	8	
Routine service-sales	11	
Self-employed	9	
Skilled manual	14	
Semi/unskilled manual	23	
Age interval		
Age 50-54	52	
Age 55-59	29	
Age 60	4	
Age 61-64	10	
Age 65	1	
Age 66-69	2	
Age 70 and older	1	
Birth cohort		
Born 1920/1929	6	
Born 1930/1939	23	
Born 1940/1949	35	
Born 1950/1959	36	

Note: Descriptive statistics based on multiple spell data, adjusted to time at risk.
Source: GSOEP-1985-2009.

Table 3. Survival Analysis Results, Piecewise-Constant Exponential Model of the Timing of Retirement.

	Model 1:		Model 2:		Model 3:		Model 4:		Model 5:	
	Base model		M1 +		M2 +		M2 + time-varying		M3 + time-varying	
	hr	se	hr	se	hr	se	hr	se	hr	se
Informal participation	-		1.052**	(.019)	1.053**	(.019)	-		-	
Formal participation	-		.939***	(.015)	.934***	(.015)	-		-	
Informal part., Age 50-59	-		-		-		.993	(.025)	.993	(.025)
Informal part., Age 60 plus	-		-		-		1.120***	(.029)	1.122***	(.029)
Formal part., Age 50-59	-		-		-		.906***	(.021)	.901***	(.021)
Formal part., Age 60 plus	-		-		-		.968	(.020)	.962	(.020)
Home owner	-		-		1.013	(.033)	-		1.013	(.033)
Net labor income (ln)	-		-		.852***	(.019)	-		.852***	(.019)
Socio-demographics (ref. male, West Germany)										
Male, East Germany	.973	(.045)	.987	(.046)	.896*	(.044)	.989	(.046)	.898*	(.044)
Female, East Germany	1.266***	(.064)	1.249***	(.063)	1.066	(.060)	1.246***	(.063)	1.064	(.059)
Female, West Germany	1.242***	(.051)	1.217***	(.050)	1.086	(.048)	1.217***	(.050)	1.085	(.048)
Foreign born	1.005	(.044)	.968	(.043)	.986	(.046)	.968	(.043)	.987	(.046)
Family situation (ref. married, spouse working)										
Married, spouse inactive	1.376***	(.046)	1.373***	(.046)	1.395***	(.047)	1.374***	(.046)	1.396***	(.047)
Divorced or separated	1.032	(.063)	1.023	(.063)	1.054	(.065)	1.019	(.062)	1.049	(.065)
Single	1.166	(.109)	1.148	(.107)	1.183	(.111)	1.139	(.107)	1.173	(.110)
Widowed	1.176*	(.083)	1.170*	(.083)	1.189*	(.084)	1.164*	(.083)	1.183*	(.084)
Number of children	.987	(.011)	.986	(.011)	.988	(.011)	.986	(.011)	.987	(.011)
(Grand)Parent 70+ living in HH	.984	(.202)	.998	(.205)	1.001	(.205)	.993	(.204)	.995	(.204)
Satisfaction with health	.905***	(.006)	.905***	(.006)	.907***	(.006)	.905***	(.006)	.907***	(.006)
Social class (ref. unskilled worker)										
High service	.682***	(.038)	.694***	(.039)	.805***	(.048)	.693***	(.039)	.803***	(.048)
Low service	.828***	(.039)	.844***	(.040)	.929	(.046)	.845***	(.040)	.930	(.046)
Routine non-manual	.864*	(.054)	.878*	(.055)	.944	(.060)	.879*	(.056)	.946	(.061)
Routine service-sales	1.037	(.055)	1.048	(.055)	1.074	(.057)	1.049	(.055)	1.075	(.057)
Self-employed	.533***	(.034)	.542***	(.035)	.574***	(.037)	.544***	(.035)	.576***	(.037)
Skilled manual	1.094	(.052)	1.093	(.052)	1.129*	(.054)	1.098*	(.052)	1.133**	(.054)
Work experience	1.007**	(.002)	1.007**	(.002)	1.008***	(.002)	1.007**	(.002)	1.008***	(.002)
Unemployment experience	1.074***	(.008)	1.075***	(.008)	1.065***	(.008)	1.075***	(.008)	1.066***	(.008)

Table continues on next page

Table 3 continued

Age interval (ref. age 50-55)										
Age 55-59	2.671***	(.130)	2.672***	(.130)	2.673***	(.130)	2.670***	(.130)	2.671***	(.130)
Age 60	5.500***	(.345)	5.510***	(.346)	5.434***	(.341)	4.151***	(.403)	4.087***	(.397)
Age 61-64	5.845***	(.333)	5.866***	(.335)	5.715***	(.327)	4.401***	(.414)	4.280***	(.403)
Age 65	9.997***	(.847)	10.042***	(.851)	9.440***	(.805)	7.490***	(.853)	7.028***	(.802)
Age 66-69	5.203***	(.439)	5.211***	(.440)	4.651***	(.401)	3.873***	(.443)	3.449***	(.399)
Age 70 and older	5.441***	(.636)	5.455***	(.638)	4.867***	(.575)	4.049***	(.567)	3.602***	(.509)
Birth cohort (ref. born 1940/1949)										
Born 1920/1929	.938	(.051)	.941	(.051)	.873*	(.049)	.955	(.052)	.886*	(.049)
Born 1930/1939	1.138***	(.039)	1.138***	(.039)	1.078*	(.038)	1.137***	(.039)	1.077*	(.038)
Born 1950/1959	.592***	(.036)	.592***	(.036)	.605***	(.037)	.595***	(.036)	.608***	(.037)
Log-likelihood	-4,424.652		-4,413.877		-4,389.122		-4,405.235		-4380.448	
AIC	8,907.304		8,889.755		8,844.245		8,876.470		8,830.897	
BIC	9,165.780		9,166.057		9,138.373		9,170.598		9,142.850	
Royston & Sauerbrei R-squared	.314		.316		.318		.317		.319	

Notes: Coefficients are hazard ratios (standard errors of estimates in brackets). R-squared calculated following Royston (2006).

N=54,883, 4,575 events.

* p<0.05, ** p<0.01, *** p<0.001, two-tailed tests.

Source: GSOEP 1985-2009

Figure 1. Kaplan-Meier Estimates of the Survival Curve, by Men and Women, East and West Germany

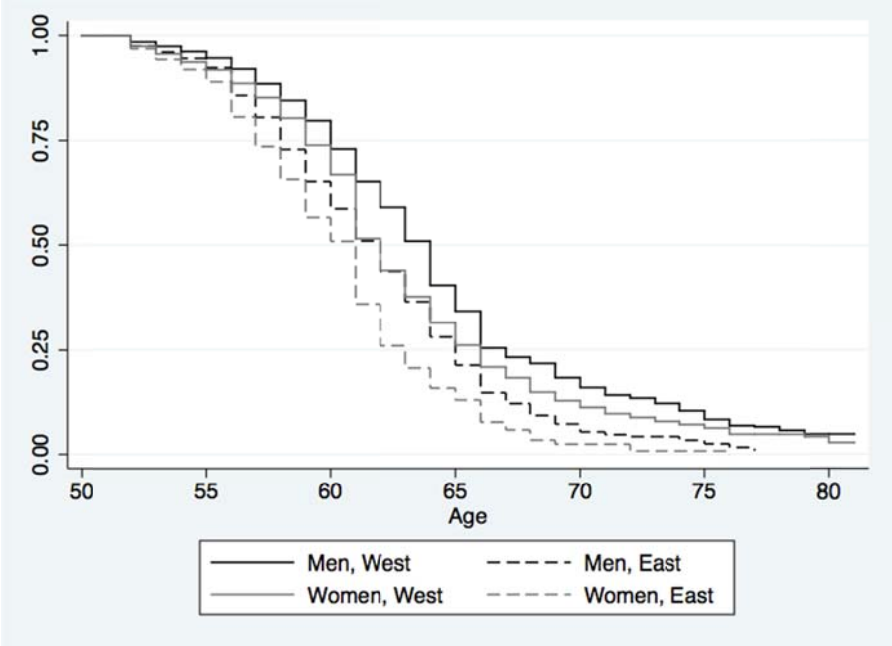


Figure 2. Predicted Survival Curves, by Social Participation.

