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Effects of retirement voluntariness on changes in smoking, drinking and physical activity among Dutch older workers

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Background: Although several studies have investigated the association of health behaviors with retirement, none has examined this relationship in the context of retirement voluntariness. **Methods:** Using data from the 2001 and 2007 waves of a panel study of retirement in the Netherlands, we used multinomial logistic regression models to investigate the impact of retirement voluntariness on changes in smoking, alcohol use, and physical activity. Participants included 1604 individuals, aged 50–64 years, who were employed in 2001. **Results:** During the 6-year follow-up, 884 (55%) sample members retired: 676 (42%) perceived their retirement as voluntary and 208 (13%) perceived their retirement as involuntary. Results of multinomial logistic analyses indicated that, relative to non-retired participants ($n = 720$), the voluntarily retired had higher risk of increased physical activity [relative risk ratio (RR) = 2.90, 95% confidence interval (CI): 2.19–3.84] and lower risk of decreased physical activity (RR = 0.35, 95% CI: 0.22–0.56). The involuntarily retired had both higher risk of increased smoking (RR = 3.68, 95% CI: 1.45–9.30) and lower risk of decreased smoking (RR = 0.50, 95% CI: 0.25–0.99), lower risk of decreased alcohol use (RR = 0.47, 95% CI: 0.29–0.73), and both higher risk of increased physical activity (RR = 2.14, 95% CI: 1.47–3.13) and lower risk of decreased physical activity (RR = 0.46, 95% CI: 0.23–0.92). **Conclusion:** Accounting for the perceived voluntariness of retirement is essential to obtaining a clear assessment of the behavioral effects of this type of labor force departure.

Keywords: drinking, health behaviors, physical activity, retirement, smoking.

Introduction

Considerable research has been aimed at identifying factors that contribute to successful lifestyle changes. Smoking, alcohol consumption and physical activity are among the most important indicators of a healthy lifestyle, and have been associated with numerous health outcomes in mid- and later-life, including functional ability, mobility and chronic diseases.[1,2] Nevertheless, the impact of life-course transitions, such as retirement, on such health behaviors remains poorly understood. Figures from 2006 for the Netherlands show that 11% of the population aged 55–64 meet the definition of heavy users of alcohol, 28% are heavy smokers and about 28% do not take enough physical exercise.[3] For people in this age range, retirement from active employment is an impending transition of paramount significance that encompasses the challenges of social and psychological detachment from work and the development of a post-retirement lifestyle.[4]

Retirement is an increasingly complicated process of labor force withdrawal[5] whose putative relationship to behavior is similarly complex, and may be influenced by the circumstances surrounding the withdrawal. Retirement may have a dual effect on retirees' behavior, depending on its framing as either loss or relief.[6] Empirical studies consistently indicate that a substantial proportion of retirees (20–30%) perceive their retirement as forced or involuntary.[7,8] Analyzing retirement in the context of its voluntariness may provide greater insight into its relationship to subsequent health behaviors.

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The key distinguishing mediating feature between involuntary (i.e. loss) and planned (i.e. relief) retirements is psychological stress, which we propose is more prevalent in the involuntary departures. The involuntary retirement is at odds with the individual's cognitive perception of an aptly timed departure from the labor force, which is shaped by societal norms and expectations regarding the appropriate time for retirement. In addition, involuntary retirements may limit or preclude the anticipatory socialization, peer social support and financial preparation necessary to such a significant life transition.[9–11] On the other hand, a voluntary retirement is often a positive, anticipated and welcome transition. The planned retirement occurs within the acceptable social timetable and frequently relieves the physical and psychological burdens of paid work. Moreover, there is evidence that many older workers view retirement as a health investment strategy,[12] in which they retire as a means to preserve their health. In this case, workers anticipate positive health changes.

The extant literature has not addressed retirement with regard to its voluntariness. Research on post-retirement smoking has been mixed, with both positive effects[13] and no effects[14] reported. The findings of studies investigating the association between retirement and alcohol use have been similarly inconsistent, with some studies reporting a positive association between retirement and increased or problematic drinking behavior[15,16] and others reporting a decrease in alcohol consumption.[17] Few studies of which we are aware have explored changes in physical activity following retirement.[18–20] Slingerland and colleagues[18] found no change in sports and non-sports activities, despite a predictable decline in employment-related physical activity (e.g. work-related tasks and transportation to/from work). On the contrary, Evenson *et al.*[19] found that retirement was associated with a significant increase in sports and exercise participation, when compared with continuing to work over a 6-year period. However, that study documented a simultaneous increase in

television watching among study participants, which leaves unanswered the question of the net effect of retirement on the total level of physical activity.

The objective of this study is to examine changes in smoking, drinking, and physical activity of voluntary retirees, involuntary retirees and non-retirees. Specifically we hypothesize that, compared with non-retirement, voluntary retirement will be associated with healthy behavioral (lifestyle) changes, whereas involuntary retirement will be associated with unhealthy lifestyle changes. We posit that unhealthy behavioral changes among the involuntarily retired will arise in response to the multiple stressors associated with an unplanned departure from the workforce.

Methods

Population

The data used in this investigation were taken from a panel study on retirement behavior in the Netherlands, carried out by the Netherlands Interdisciplinary Demographic Institute (NIDI). In 2001 (Wave 1), data were collected from two sources: (i) older employees of more than 80 business units attached to three large Dutch multinational companies that are active in the fields of information and communications technology (ICT), retail, trade, and industry; (ii) older Civil Servants, who were employed by the Central Government. A questionnaire was mailed to an aselect sample of employees aged 50 years and over ($n = 3900$) and their spouses. The total number of individuals who completed the survey at Wave 1 was 2406. Response rates for older workers and their partners were 62 and 92%, respectively.

In 2006–07 (Wave 2), a follow-up survey was conducted, in which all surviving Wave 1 participants were re-surveyed, once again by mail questionnaire. The Wave 2 survey asked respondents about changes in employment status, including retirement, since Wave 1, as well as modification of health-related behaviors. A total of 2240 questionnaires were sent to surviving Wave 1 participants. One thousand six hundred and seventy-eight surveys were returned, providing complete or virtually complete data. Wave 2 response rates, following two reminder notices, were 75% for older workers and 97% for partners. Of the total potential sample of 1678, we excluded 74 individuals who indicated that they retired for health reasons, as their inclusion could bias our findings. The final study sample thus included 1604 individuals. As item non-response was under 3%, missing data were imputed using mean substitution.

Regarding attrition, 45 respondents died between survey waves. We discovered limited selective non-response. Whereas neither Wave 1 health nor sex predicted participation likelihood at Wave 2, younger and less educated persons were somewhat less likely to participate in the follow-up survey.

Measurements

Outcome variables

Changes in health-related behaviors are represented by three variables, which were created based on data provided at Wave 2. These variables measure the extent to which study participants have altered their smoking, alcohol consumption, and physical exercise in relation to their behavior at Wave 1. As regards smoking and alcohol use, participants were asked: 'Have you, in the past 5 years, started smoking (drinking alcohol) more?' Responses were coded: 1 = smoke (drink) less, 0 = no change/do not smoke (drink), −1 = smoke (drink) more. For physical activity, participants were asked an equivalent question: 'Have you, in the past 5 years, participated more in physical activity?' Responses were coded: 1 = exercise more, 0 = no change, −1 = exercise less.

Primary Explanatory Variable

The voluntariness of retirement, assessed Wave 2, is the explanatory factor of interest in this study. To create this measure, we combined responses from two Wave 2 survey questions. Participants were first asked whether they had retired between survey waves. Individuals who responded affirmatively were then asked about the extent to what their retirement was voluntary (yes, entirely voluntary; no, partly involuntary; no, completely involuntary). Two, mutually-exclusive dummy variables were included. Involuntary retirement is coded 1 where participants indicated that their retirement was partly or completely involuntary, and 0 for voluntary or non-retirement. Voluntary retirement was coded 1 if retirement was completely voluntary, and 0 for involuntary or non-retirement. The referent category therefore consists of individuals who did not retire between survey waves.

Covariates

Covariates in this study comprised time-invariant factors, measured at Wave 1. All demographic covariates, with the exception of gender, are continuous. Gender is represented by a dummy variable (male = 1). Age (in years) is a continuous variable. Educational attainment is a variable that ranges from [1] (elementary schooling) to [7] (university graduate). Wealth is a 7-category continuous variable that measures the total value of household property (including housing and non-housing assets, savings and other financial wealth), net of debt. Categories range from [1] (<500 Euros) to [7] (>500 000 Euros). We should note that while cross-wave changes in wealth might be preferable to this pre-retirement static measure as a predictor of behavioral changes, wealth data were not collected at Wave 2. We are thus limited to the Wave 1 measure.

Four variables were used to control work environment in the Wave 1 job. Physically demanding job is a dummy variable, coded 1 if respondents provided an affirmative response to either of the following two Wave 1 survey statements: [1] 'My work is physically demanding'. [2] 'My work is characterized by many inconveniences (such as odors, noise or draft)'; and 0: otherwise. Job pressure is a 3-item scale (range 0–5; $\alpha = 0.75$), based on responses to the following three Wave 1 statements: [1] 'My job pressure is so great that it creates tensions'; [2] 'At times, there is so much work to be done that I'm unable to do everything'; [3] 'I often have to do my utmost to perform well'. Unweighted, 5-point Likert-scaled responses ('completely agree', 'agree', 'neither agree nor disagree', 'disagree', 'completely disagree') were first summed, and subsequently linearly transformed into a 0–5 range, where higher values represent greater pressure. Job challenges is a 3-item scale (range 0–5; $\alpha = 0.75$), based on responses to the following statements: [1] 'My work is characterized by many challenging tasks'; [2] 'The work that I am doing is not very challenging'; [3] 'The work that I am doing has become more and more boring and routine'. Unweighted responses and 5-point Likert-scaled for statements [1], [2] and [3] were combined, with appropriate reverse-coding, and transformed as they were with job pressure, so that higher values indicate greater work challenges. Shift work is a dummy variable, coded 1 if participants indicated that they worked in shifts (i.e. did not consistently work the same hours), and 0 otherwise.

Analyses

We described the sample using means and standard deviations. We used multinomial logistic models, in which the values of our dependent variable are treated as categorical, to estimate the impact of retirement voluntariness on changes in smoking, drinking and physical activity. All models were adjusted for clustering at both the company and business unit levels using the SVY command in STATA.[21,22]

Results

Table 1 provides a description of the sample. At the study baseline, all participants were employed. During the 6-year follow-up, 55% of sample members retired: 42% perceived their retirement as voluntary and 13% perceived their retirement as partially or completely involuntary. Table 2 provides changes in smoking, drinking and physical activity in our sample, both for the full sample and by retirement status. For the full sample, a tendency toward decreased smoking and lower alcohol use is indicated. Changes in the direction of a healthier lifestyle are most clearly visible in physical activity, where >40% of participants report an increase in physical activity.

Table 1 Baseline (2001) Characteristics of the sample: means (M), standard deviations (SD) of independent variables for dutch older workers (NIDI study of retirement behaviour 2001–07)

	M	SD
Gender	0.75	0.44
Age at baseline	54.8	2.8
Wealth	4.3	1.6
Education	4.2	1.8
Demanding job	0.21	0.4
Job pressure	2.27	1.1
Job challenge	2.94	1.1
Shift work	0.09	0.28
Retirement		
Retired involuntarily	0.13	0.35
Retired voluntarily	0.42	0.49
Not retired (ref.)	0.45	0.43

NIDI, Netherlands Interdisciplinary Demographic Institute

Comparing individuals across retirement categories, we find a number of notable differences. The proportion of participants who report increased smoking is higher among the involuntarily retired than either the voluntarily retired or non-retired. A similar pattern is suggested by the data on decreased smoking, although the difference in percentages between the retired groups is less pronounced. Increases in alcohol consumption are most prevalent among the voluntarily retired, followed by the involuntarily retired and non-retired. The proportion of participants who increased physical activity between survey waves among the voluntarily retired and involuntarily retired participants was roughly twice that of non-retired sample members.

The results of adjusted multinomial logistic analyses of the effect of retirement voluntariness on health behaviors, presented in table 3, confirm the descriptive findings. Column 1 provides results for changes in smoking behavior. Columns 2 and 3 present results for changes in drinking behavior and physical activity, respectively. Relative risk ratios (RR) and 95% confidence intervals (CI) are presented. The central variables of interest are the two dummy variables indicating whether workers retired 'involuntarily' or retired 'voluntarily' between the survey waves. The results indicate that participants who experienced involuntary retirement had significantly higher risk of increased smoking (RR = 3.68, 95% CI: 1.45–9.30) and significant lower risk of reduced smoking (RR = 0.50, 95% CI: 0.25–0.99) than members of the reference group of non-retirees. The risk of altered smoking behavior (increased and decreased) among workers who reported voluntary retirements was not significantly different from that of the non-retired. Participants who retired involuntarily also had significantly lower risk of reduced alcohol consumption (RR = 0.47, 95% CI: 0.29–0.73) than the non-retired. As in the smoking findings, no differences between the voluntarily retired and non-retired were detected. Both modes of retirement were, however, associated with changes in physical activity. Voluntary retirement was related to significantly higher risk of increased physical activity (RR = 2.90, 95% CI: 2.19–3.84) and lower risk of decreased physical activity (RR = 0.35, 95% CI: 0.22–0.56). For involuntary retirement, we observe similar—though somewhat less pronounced—effects: an elevated risk of increased activity (RR = 2.14, 95% CI: 1.47–3.13) and lower risk of decreased physical activity (RR = 0.46, 95% CI: 0.23–0.92).

Table 2 Changes in health behavior between 2001 and 2006/2007: full sample and by retirement status for dutch older workers (NIDI Study of retirement behaviour 2001–07)

	Full sample (%)	Involuntarily retired (%)	Voluntarily retired (%)	Non-retired (%)
Have you . . . (in the past 5 years)				
a. started smoking more?				
Yes, more	1.7	3.5	1.7	1.3
Same	12.7	12.7	11.7	13.4
No, less	9.4	5.5	9.1	10.5
n.a. (not smoking)	76.2	77.7	77.6	74.8
b. started drinking more alcohol?				
Yes, more	4.4	2.5	5.8	3.8
Same	57.9	66.3	59.4	58.1
No, less	15.3	11.1	14.6	17.2
n.a. (not drinking)	20.5	20.1	20.3	20.9
c. been doing more physical activity?				
No, less	9.7	7.6	4.8	14.9
Same	50.3	47.5	41.7	59.1
Yes, more	40.0	45.0	53.5	26.0
N	1604	208	676	720

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Table 3 Multinomial logistic estimates of changes in health behaviours, Dutch older workers (NIDI Study of retirement behaviour 2001–07)

	Changes in health behaviours					
	Smoking		Drinking		Physical activity	
	RR	95% CI	RR	95% CI	RR	95% CI
Involuntary retirement[a]						
Increase	3.68	1.45–9.30**	0.48	0.19–1.20	2.14	1.47–3.13**
Decrease	0.50	0.25–0.99*	0.47	0.30–0.73**	0.46	0.23–0.92*
No change	Ref.		Ref.		Ref.	
Voluntary retirement[a]						
Increase	2.06	0.74–5.79	1.36	0.80–2.34	2.90	2.19–3.84**
Decrease	0.95	0.66–1.38	0.72	0.51–1.01	0.35	0.22–0.56**
No change	Ref.		Ref.		Ref.	
Male gender						
Increase	0.73	0.24–2.17	0.51	0.19–1.34	1.31	0.98–1.75
Decrease	0.79	0.45–1.42	0.82	0.49–1.35	0.99	0.70–1.40
No change	Ref.		Ref.		Ref.	
Age (in years)						
Increase	0.87	0.73–1.03	1.02	0.93–1.11	0.99	0.95–1.03
Decrease	0.97	0.89–1.06	1.04	0.98–1.10	1.06	0.99–1.14
No change	Ref.		Ref.		Ref.	
Education						
Increase	0.84	0.70–1.01	1.23	1.06–1.42**	1.05	0.97–1.14
Decrease	1.01	0.91–1.12	0.96	0.89–1.05	1.02	0.89–1.17
No change	Ref.		Ref.		Ref.	
Wealth						
Increase	0.81	0.68–0.97*	1.11	0.93–1.33	1.00	0.93–1.07
Decrease	0.87	0.79–0.96**	0.98	0.85–1.13	0.88	0.78–0.99*
No change	Ref.		Ref.		Ref.	
Phys demanding job						
Increase	1.60	0.74–3.45	1.78	0.89–3.54	0.77	0.61–0.98
Decrease	1.33	0.75–2.34	1.65	1.22–2.21**	0.97	0.59–1.60*
No change	Ref.		Ref.		Ref.	
Job pressure						
Increase	1.33	0.80–2.23	1.13	0.86–1.49	1.01	0.93–1.10
Decrease	0.93	0.80–1.09	0.94	0.83–1.06	1.06	0.94–1.19
No change	Ref.		Ref.		Ref.	
Job challenges						
Increase	1.10	0.78–1.56	0.95	0.74–1.22	0.97	0.86–1.08
Decrease	1.14	0.97–1.33	0.97	0.84–1.13	0.83	0.70–0.99*
No change	Ref.		Ref.		Ref.	
Shift work						
Increase	0.72	0.27–1.92	1.06	0.35–3.24	0.93	0.70–1.25
Decrease	1.46	0.89–2.39	1.49	0.95–2.33	1.31	0.67–2.57
No change	Ref.		Ref.		Ref.	

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*Two-sided $P < 0.05$
**Two-sided $P < 0.01$
a: The non-retirees serve as the reference category

Discussion

This 6-year follow-up study investigated the impact of retirement voluntariness on self-reports of health behavior changes among a cohort of Dutch workers who were aged 50–64 years at the 2001 study baseline. Its findings suggest a multifaceted relationship between retirement and behavioral health indicators. Our analyses indicated that retirement is associated with both positive and negative changes in health behaviors. Whereas retirees, irrespective of the voluntariness of their labor force exits, tended to adopt a healthier post-retirement lifestyle with regard to physical activity, there is also evidence that they engage, with greater frequency, in such unhealthful behaviors as smoking and drinking. More specifically, workers who retired involuntarily had elevated risk of smoking more and reduced risk of both smoking and drinking less, which may suggest that involuntary retirees use alcohol and tobacco as a means to cope with the cognitive stress produced by an unplanned exit from paid work. With regard to physical activity, the results may mean that the removal of employment-based time constraints enhanced opportunities for physically related leisure activities, which were undertaken by retirees, regardless of the circumstances of their departures.

The results are generally supportive of our hypothesis that the perceived voluntariness of the retirement experience would give rise to differences in post-retirement changes in health behaviors. Overall, the findings confirm positive health behavior changes in physical activity among the voluntarily retired, and negative changes, in smoking and alcohol use, among the involuntarily retired. The former result may suggest that workers retire as a means to improve their health via greater participation in healthy pursuits, which can be thought of as an investment in well-being. Nevertheless, a somewhat unexpected finding is that the involuntarily retired simultaneously increased their physical activity, which is a rather healthy response, and one that is at odds with the potential physiological and medical consequences of more smoking and,

more remotely, greater alcohol use. This inconsistency may suggest that there are separate mechanisms at play. In other words, it is conceivable that the dominant mediating factor in the pathway between involuntary retirement and the unhealthy behaviors is some form of stress, whereas the prevailing mediator for physical activity may simply be the introduction of leisure time. Other interpretations are, however, possible. For example, the increase in physical activity may not represent a positive behavioral choice, but may rather signify more walking, biking or manual activity, imposed by the income shock and asset spend-down arising from the unplanned work departure.

Such an idea naturally leads to the inevitable discussion of the meaning of physical activity. Some respondents may interpret physical activity narrowly to mean sports or exercise. Other respondents may give a broader meaning, which, for the retired, could involve gardening and house chores or improvements, etc, and for the non-retired might include strenuous work. The physical activity findings must be considered in light of this potential heterogeneity of interpretation.

Because we disaggregate retirement according to its voluntariness, our findings are, to some extent, difficult to relate to those of the extant research, which typically measures retirement with a global variable that does not take account of the employer's bearing on the decision to retire. The smoking and alcohol results, in which we find significant associations for only one (i.e. involuntarily retired) of the two groups, are especially difficult to place in the context of the earlier studies' findings. Nonetheless, the physical activity results, which are consistent in direction and statistical significance in the two retirement categories, appear to support the findings of Evenson *et al.*[19] who reported increased activity in sports and exercise activities after retirement, and Mein *et al.*[20] who reported higher rates of physical activity among retirees, but not Slingerland *et al.*[18] who did not find a similar increase. Even so, the reader should be aware that the comparability of these studies is limited by differences in the measurement of change across studies.

There are several noteworthy strengths of this study. The most obvious is our capability to distinguish voluntary and involuntary retirements, which permitted us to determine whether the circumstances surrounding retirement may contribute to differences in the behavioral response. This is an important advancement in this literature, as disaggregation of retirement according to its voluntariness eliminates the possibility that variation in direction, magnitude and statistical significance of the component variables could lead us to draw erroneous conclusions about the actual impact of retirement on changes in health behaviors. Next, our data allow the analysis of three important lifestyle outcomes with respect to retirement, a somewhat rare luxury in this field. And finally, the rich measures of pre-retirement employment attributes mean that we can more effectively control theoretically important confounding relationships in testing the association between retirement and behavioral changes.

The study, nevertheless, has a number of limitations. Although our data were collected with the intention of investigating numerous retirement-related outcomes, they are not nationally representative, and may thus not be entirely generalizable to the Dutch population. Moreover, while the data set is sizable, statistical power remains somewhat restricted. In particular, the small cell sizes among participants who reported increased smoking between survey waves translated to rather wide confidence intervals on the estimated RRs for our key variables. Our study is furthermore capable only of identifying the occurrence of changes in health behaviors; we are unable to comment on the extent of such changes. As with any observational study, the temporal ordering of the exposure and outcome is not certain, which means that some of the behavioral changes may have occurred prior to retirement. In particular workers may have changed their health behaviors in anticipation of retirement. Next, our analyses rely on self reports of change, which may be prone to bias deriving from respondents' desire to provide socially acceptable responses. And finally, our alcohol use data do not allow the discernment of whether increased consumption across time was actually health promoting. This would be the case if non-drinkers at baseline began to drink in the light-to-moderate range.

Although health limitations are among the most important determinants of retirement decisions, the consequences on retirement of health behaviors have been less clear. The results of this study suggest that retirement is associated with health behavior changes, and that analyzing retirement in the context of its voluntariness is essential to obtaining an accurate assessment of its effect on health behaviors. Healthcare professionals who treat retirees should be aware of the heightened risk of potentially unhealthy behavior associated with unplanned retirement. Where possible, future studies should also disaggregate retirement by its voluntariness. The analysis of a wider range of health behaviors (e.g. eating behavior/weight changes, sleeping) could further highlight differences in post-retirement well-being according to the context of the retirement.

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Key points

- The circumstances under which individuals retire may translate to differences in their health behaviors after retirement.
- Individuals who perceive their retirement as involuntary have a greater likelihood than non-retired individuals of smoking more and a lower likelihood of drinking less alcohol, which are potentially harmful, although they also report more physical activity, which may be beneficial.
- Healthcare professionals who treat retirees should be aware of the heightened risk of potentially unhealthy behavior associated with unplanned retirement.

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