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# Changes in work ability according to type of pension benefit – A 28-year prospective study

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## Abstract

*This study focuses on changes in work ability according to old-age, individual early, and disability pensions over a 28-year time period. This prospective follow-up study showed significant differences in the development of work ability according to different pension benefits pre and post-retirement. Individuals who exited the workforce due to old age showed a steady decline in their self-rated work ability during follow-up. For those who exited the workforce due to individual early retirement or disability pension, a U-shaped curve, with a distinctive post-retirement recovery was detected. In addition to aging, the changes may be due to several situational factors.*

**Key terms:** Work ability, pension benefit, prospective study, resource based theory

## Introduction

Individuals' well-being and ability to adapt to life changes is dependent on numerous resources. The resource perspective (1) can be used to understand retirement transition and adjustment processes (2). According to Hobfoll's (3) conservation of resources (COR) theory, individuals build, protect, and retain their resources. In the retirement context, resources may be physical, cognitive, motivational, financial, social, and emotional (2). The theory further postulates that when faced with loss of resources, an individual will experience distress and may consequently develop mental and physical health problems (4). The prevalence of adverse outcomes such as mobility limitations, disability in everyday tasks and related service use increases with older age (5, 6). To avoid, retard or reverse the normal age-related process of decline in functioning (7), physical as well as mental resources are needed for compensation of decline and optimizing the remaining resources that are needed for leading an independent and socially active life in old age (8, 9).

Building upon the resource perspective, we use the Work Ability Index (10) to explore individual physical and mental resources with respect to work and/or every-day-life demands. Work ability has been conceptually defined as the measure of how good the worker is at present and will be in the near future, and how able s/he is to do his or her job with respect to the demands of the job and their health and mental resources (11). An imbalance between employee resources and work demands may have detrimental effects on their work status, health, and well-being over time (12, 13). Work ability can be promoted by managerial means. This includes taking work demands, the environment, work organization, and employees' health, functional capacity, and competences into consideration (14). The work ability of ageing employees, especially in the age group 52-58 years, tends to decline dramatically (12). However, whether the associations of adult working life extend well into old age is not clear (15). There are indications that work has far-reaching effects on individuals' ability to function in

old age. Using data stretching from midlife to old age, we found in a recent study that midlife work ability correlated with old age disability for women and with mortality for men (16).

The mandatory retirement age in the Finnish municipal sector before 2004 was 63-65, with the exception of some occupation-specific lower retirement ages (e.g. nurses, bus drivers). However, in the 1980's and 1990's several employees exited working life before their official retirement age into disability or individual early retirement. In case of disability retirement, clinically diagnosed illness or injuries serve as evident reasons, push factors (17). Alternatively, employees could apply for an individual early retirement pension at the age of 58. In order to receive individual early retirement, employees had to have a permanently reduced working capacity, a long work history, and a reduced capacity to cope with work demands. Work ability is a strong predictor of employee early retirement (14). Hence, type of pension benefit (old age, individual early and disability retirement pension) can reflect the balance between employees' resources and his or her work demands.

## Objectives

This study adapts a resource based theory perspective in investigating changes in employee work ability from active mid-working life to old age according to the pension benefit they qualified for. In exploring both within and between group-variation, we use a large scale population-based 28-year longitudinal study.

## Methods

This study is based on the Finnish Institute of Occupational Health co-ordinated Finnish Longitudinal Study on Municipal Employees (FLAME), which focused on health, work, lifestyle, and retirement among employees in the municipal sector (18). Altogether 7,344 em-

ployees were chosen randomly from all municipal professions in different parts of Finland aged 44-58 years at baseline in 1981. With a response rate of 85.2 percent, the baseline cohort consisted of 6,257 employees (44.7 % men). Since the 1981 baseline, four consecutive follow-up data collections took place in 1985 (respondents 5,556, non-respondents [NR] 600, deceased 101), 1992 (respondents 4,534, NR 1,329, deceased 394), 1997 (respondents 3,817, NR 1,695, deceased 745) and 2009 (participants 3,093, NR 1,085, deceased 2,078). Baseline characteristics are shown according to pension benefit group in Table 1.

Work ability was elicited as a subjective assessment of present work ability in relation to lifetime best, which is the first item on the Work Ability Index (WAI). WAI has been validated against clinical data (19) and the first item on the scale has been shown to capture most of the variability of the entire scale (12). The work ability score ranged from 0 to 10, with higher scores implying better work ability. Work ability was measured in all five study waves (in 2009 for 1,669, 40 % of the survivors). Record-based data regarding the different types of pension benefits (old-age, disability and individual early retirement) were required from the Finnish Centre of Pensions. Mortality data was obtained from the Population Register Centre of Finland. Repeated measures ANOVA was used to explore within and between group variance changes in work ability from active mid-working life to old age according to different types of pension benefits. All statistical analyses were performed with SPSS (15.0). Repeated measures ANOVA were used to explore within and between group variance in work ability according to pension benefit groups. The sphericity assumption was not met (Mauchly's test of sphericity, Greenhouse-Geisser  $p=.899$ , Huynh-Feldt  $p=.902$ ), which indicated that the variance between the measures was not homogeneous. Hence, we used the Greenhouse-Geisser estimate as a correction factor. It was applied to the degrees of freedom used to calculate the p-value for the observed value of  $F$ .

**Table 1.** Baseline characteristics according to subsequent type of pension benefit

Variables	Old age retirement (n=3666)	Individual early retirement (n=808)	Disability retirement (n=1293)	p-value of $\chi^2$ or F-test†
Age, mean $\pm$ SD	51.5 $\pm$ 3.6	48.5 $\pm$ 2.2	50.8 $\pm$ 3.4	<.001
Gender, % (n)				<.001
men	40% (1459)	46% (373)	50% (648)	
women	60% (2207)	54% (435)	50% (645)	
Type of work, % (n)				<.001
upper white collar	23% (833)	22% (176)	13% (170)	
lower white collar	38% (1400)	30% (239)	26% (330)	
blue collar	39% (1433)	49% (393)	61% (793)	
Work ability, mean $\pm$ SD	7.7 $\pm$ 1.6	7.5 $\pm$ 1.6	6.4 $\pm$ 2.2	<.001
Deceased during the follow-up, % (n)	26% (957)	20% (180)	44% (566)	-
Participated in all data collection waves, % (n)	44% (1611)	45% (360)	27% (351)	-

† Categorical variables analyzed using the chi-square-test, continuous variables with ANOVA

## Results

The findings of the repeated measures ANOVA analysis are presented in Table 2. Tests of within-subjects effects indicated that work ability declined during the 28-year follow-up period ( $F=665.320$ ,  $df=3.596$ ,  $p<0.001$ ). The between-subject effect showed a statistically significant difference between the three pension benefit groups ( $F=379.385$ ,  $df=2$ ,  $p<0.001$ ). Finally, a statistically significant group-by-time interaction in work ability for all three pension benefit groups during 28-year follow-up was detected, suggesting that the change patterns differed between the pension benefit groups ( $F=102.122$ ,  $df=7.193$ ,  $p<0.001$ ) (Figure 1). The decline was non-linear for those who had exited into disability and individual early retirement with a post-retirement recovery in work ability. Those who had retired due to old age showed a linear decline, but at a higher level than other groups.

## Discussion and Conclusions

Work ability declines as individuals approach the third age. Data extending from active mid-working life well into old age allowed us to explore work ability patterns throughout the adult life span. This 28-year prospective follow-up study revealed significant differences in work ability according to different pension benefits. The findings support earlier studies in that individuals who retire due to old age reported a steady decline in their work ability during follow-up (12). For those who entered into individual early retirement or disability pension, a U-shaped curve with a post-retirement recovery was detected. These individuals were granted their retirement predominantly between 1985 and 1997. The work ability of these two groups was at its lowest around the data collection in 1992.

**Table 2.** Changes in work ability according to type of pension benefit, Repeated measures ANOVA.

Variables	Old age retirement (n=1155)	Individual early retirement (n=263)	Disability retirement (n=251)
Work ability, 1981 mean ± SD	7.96 ±1.50	7.72 ±1.46	6.66 ±2.01
Work ability, 1985 mean ± SD)	7.45 ±1.54	7.01 ±1.51	4.74 ±3.02
Work ability, 1992 mean ± SD	6.73 ±1.97	3.83 ±2.65	2.32 ±2.53
Work ability, 1997 mean ± SD	6.42 ±1.88	4.38 ±2.49	3.56 ±2.60
Work ability, 2009 mean ± SD	5.86 ±2.24	5.31 ±2.10	4.30 ±2.50
F (work ability), within- subject effect†	F=665.320, df=3.596, p<0.001		
F (pension benefit group), between- subject effect	F=379.385, df=2, p<0.001		
F (work ability x pen- sion benefit group), within-subject effect†	F=102.122, df=7.193, p<0.001		

† With Greenhouse-Geisser correction of degrees of freedom



**Figure 1.** Within and between group changes in work ability during 1981 and 2009 according to pension benefit.

Additional sub-group analyses (not shown here) revealed that similar patterns of changes in work ability according to pension benefit group were found in men and women, as well as in upper and lower white-collar, and blue-collar employees. Several possible explanations for the differences in the work ability patterns over time need to be considered. First, the linear decline in work ability in individuals who retired due to old age was probably due to higher age compared to the two other pension benefit groups. Second, it is possible that those who retired because of disability were sicker and suffered from higher post-retirement mortality (selective survival). Survivors with higher post-retirement work ability represent a selected group of people with improved health. These changes may also mark regression to the mean. Third, Finland faced a deep recession in the 1990's, which may have affected the work ability of individuals with declining physical and mental resources. A severe national economic crisis is likely to be reflected in employees' perceptions of their jobs. According to the resource based



theory, when faced with loss of resources, an individual will experience distress and may consequently develop mental and physical health problems (4).

The strengths of this study include the large scale prospective data covering a broad set of municipal occupations. In addition, work ability is a validated measure, which has been described as activity that is the result of the balance between work demands and strain and the individual resources and ability to meet these demands (11). A potential limitation in the analyses is the selective dropout from the study, which is inevitable in long-term prospective studies. The 'healthy worker survivor effect' is an ongoing process where those who stay in a specific profession tend to be healthier than those who leave employment (20). However, we do not believe that this would effectively explain our results as our analyses are based on prospective data of a fixed cohort. Our result may be an underestimation of the predictive value of work ability. Caution is needed when generalizing the results on population level, because occupational groups tend to be healthier than the general population that includes people outside the workforce. It can be argued that work ability measured in old age is not a valid measure for the employee resource and job demand equilibrium. However, participants were asked to evaluate their current work ability against their lifetime best. All the respondents had been part of working life and were assumed to be familiar with the requirements working entails.

In sum, the post-retirement recovery pattern among those who exited working life due to early individual and disability retirement suggests a regain in vital resources for functioning in later life (8, 9). Work ability can be promoted by managerial means. This includes taking work demands, the environment, work organization, and an employee's health, functional capacity, and competences into consideration (14). It is essential to focus on maintaining the work ability of older employees because of its effects on managing everyday tasks, which in turn is important for independence and need for care in old age (16).

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