

Perceived work changes between 1981 and 1992 among aging workers in Finland

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Objective Perceived changes in mental and physical work demands and work content were evaluated longitudinally.

Methods Municipal workers (N=924) in the same job from 1981 (mean age 47 years) to 1992 (mean age 58 years) in the work content groups of mental, mixed mental and physical, or physical work responded to a questionnaire in both 1981 and 1992.

Results The workers reported that the physical and mental demands of their jobs had mainly increased from 1981 to 1992, especially muscular work and use of knowledge. In 1992 the women still perceived higher physical demands than the men but felt they had greater possibilities to develop. The use of knowledge had increased, especially among the women, and was on the same level for both genders. The perception of changes differed in the 3 work content groups.

Conclusions Perceived work demands increase with age. Although the 3 work content categories differ somewhat as to perceived changes over time, in general, the changes may be more connected to personal factors than work factors. Older persons seem to work at a relatively higher capacity than younger workers, and this higher work load may be a risk factor for early work disability. Work demands and stress factors should therefore be surveyed and balanced according to the capacity of the aging worker. On the other hand, workers' perception of possibilities to develop seem to increase with age. The differences between men and women may especially diminish at a later age.

Key terms age, inquiry, job change, longitudinal study, work demands.

In the 1990s, in Finland, the most significant pressure for change in work conditions and work content has been connected with major changes in big business, automation, computerization, and structural factors, along with the trend towards what is called "management for results" (1, 2). The municipalities in Finland have been given greater independence from the central government, and, at the same time, must work with a stricter budget and a need for reorganization. Services have been privatized and double administrations dismantled. The economic depression at the beginning of the 1990s led to a reduction in the public sector and a reorganization of the administration for the first time in Finnish history (3). All these major changes may have had an impact on employees' jobs or, especially, on the employees' perception of their jobs.

It has been hypothesized that work demands do not change as workers grow older and their capacity declines

(4). Therefore workers may perceive a higher work strain as they grow older. On the other hand, workers may also experience lower strain in the same worktasks because of more experience and knowledge with age. In the first part of this longitudinal study, the results of a 4-year follow-up showed that the perception of both physical and mental work load had increased (5).

The objective of the present study was to evaluate the perceived changes in work demands and stress factors from 1981 to 1992 among aging workers in different work categories.

Subjects and methods

Study sample

The target group comprised employees who had municipal occupations and who were born between 1923 and

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1935. The study consisted of 2 questionnaire surveys performed in 1981 and 1992. The average follow-up period was approximately 11 years. The response rate to the questionnaire was 74.4% for the men and 79.5% for the women, calculated from those who responded to the first questionnaire. Originally, in 1981, a total of 6257 subjects responded to the questionnaire. During the follow-up period 41.5% of this group reached retirement age, 29.6% retired on a work disability pension, and 6.3% died; in addition 5% did not respond to the second questionnaire. A further 2% had changed occupations, and 0.8% had changed to part-time work. The sample in the present analysis therefore consisted of 924 subjects (14.8% of all those who responded to the questionnaire in 1981), all of whom had continued in the same occupational group. There were 350 men and 574 women. The mean age of the men was 47.3 (SD 1.8) years and that of the women was 46.9 (SD 1.8) years in 1981. The subjects were divided into physical (N = 311), mental (N = 405), and mixed physical and mental work (N = 208) according to the job analysis made in 1981 (6).

Methods and variables

Certain questions of the 1981 questionnaire were repeated in 1992 so that changes could be studied. The variables describing work demands were grouped by factor and reliability analyses and formed as sum variables (7). The contents of the sum variables and their reliability in 1981 and 1992 are presented in table 1.

Statistical analysis

The sum variables were revised into a scale from 0 to 10 to make a comparison between the variables possible. The changes in the mean levels between 1981 and 1992 were first analyzed from the sum variables. The description was also sometimes supplemented by the frequencies of single questions when they differed markedly in the same sum variable and when they gave more information on the work and the changes. In addition, the changes were analyzed in cross-tables, the categories being constructed after the sum variables in 1981 and 1992 had been divided into 2 classes each year using the median as the cut point. In the cross-table the following 4 categories were used: (i) prevalence or meaning of the stress factor still low (in both years the value of the sum variable being less or equal to the median in 1981), (ii) prevalence or meaning of the stress factor increased (1981 less or equal to the median, 1992 higher than the median), (iii) prevalence or meaning of the stress factor decreased (1981 higher than the median, 1992 less or equal), (iv) prevalence or meaning of the stress factor still high (higher than the median in both years).

The changes were examined by gender and work content. The changes in the sum variables during the

follow-up period were statistically analyzed by paired t-tests.

Results

Physical and mental demands

Among the physical and mental demands, use of knowledge, responsibility for people, and possibilities to develop were the most pronounced demands both in 1981 and 1992 (table 2). The physical and mental demands had, in most cases, increased, statistically also very significantly, during the 11 years. However, management as a stress factor remained the same from 1981 to 1992. The responsibility for people was the same in both years for the men but not for the women. The differences in

Table 1. Work load factors and their reliability in 1981 and 1992 (Cronbach's α or Pearson's correlation coefficient).

Work load factor	Reliability	
	1981	1992
Muscular work	α 0.76	α 0.73
Standing in one place		
Frequent walking or movement		
Carrying of objects by hand		
Work posture	α 0.76	α 0.74
Repetitive movements		
Bent or twisted postures		
Otherwise poor postures		
Use of knowledge	α 0.82	α 0.73
Accuracy in information processing		
Complex decision making		
Decision making under time pressure		
Responsibility for people	r 0.55	r 0.55
Communication with people		
Responsibility for others		
Possibilities for development and influence at work	α 0.85	α 0.86
Possibility to plan own work		
Possibility to influence the work environment		
Possibility to receive training and update skills		
Possibility to apply own skills		
Possibility to learn new things		
Possibility to receive recognition and esteem		
Management	α 0.79	α 0.81
Cooperation between employer and employees		
Supervisor's attitude		
Planning and direction		
Information		
Work tools and rooms	α 0.65	α 0.67
Personnel facilities		
Quality and quantity of tools		
Work rooms		
Physical-chemical environment	α 0.85	α 0.86
Dirtiness		
Dust, smoke, steam, etc		
Risk of accident		
Noise		
Vibration		
Lighting and glare		
Heat, cold and changing temperature		
Dryness		
Restless work environment and noisy people		

physical demands between the men and women had remained the same. The women perceived greater physical demands than the men in both 1981 and 1992. The responsibility for people had been greater and also increased more among the women than the men. The use of knowledge had increased more among the women than the men and, for the women, had even reached the level of the men. The perception of possibilities to develop had also increased more among the women than the men.

In the sum variables the frequencies of those who reported a single stress factor often or very often changed from 1981 to 1992. These results follow.

Work postures

Repetitive movements often or very often were reported more often by the women (45%) than the men (33%) both in 1981 and 1992. Bent or twisted postures were reported by 39% of the women in 1981 and 44% in 1992. For the men the corresponding frequencies were 29% and 31%.

Use of knowledge

Accuracy was perceived as higher in 1992 than in 1981 among both the men and the women. Complex decision making and decision making under time pressure increased only among the women.

Responsibility for people

The men had more contacts with people in their jobs in 1992 than in 1981 (often or very often 65% in 1992, 57% in 1981). The women had more responsibility for people than the men (in 1992 women 42% and men 27%).

Possibilities for development and influence

The possibilities to influence the work environment were experienced as higher in 1992 than in 1981 for the rating some extent or sufficient (from 49% for the men and 50% for the women in 1981 to 59% for the men and 66% for the women in 1992). The possibility to learn new things and develop oneself was experienced as greater than before for both genders. In addition, the women felt that they had had more training to develop their own competence and more use of their skills and knowledge than before.

Management as a stress factor

The respondents were highly or fairly satisfied with the cooperation between the employer and employees. In 1992, approximately two-thirds of both the men and the women reported that they were highly or fairly satisfied with the planning and direction of their work. In 1981, 29% and, in 1992, 24% of the women (25% and 21% of the men) were highly satisfied with the attitudes of their own supervisor. The women were more satisfied with the information received in their work than the men were.

Physical work environment

Tools and workrooms decreased as a stress factor from 1981 to 1992 among both the men and the women, although the perception of the physical-chemical environment increased (table 3). A comparison of the 2 years is difficult in the case of the physical-chemical environment because the questions differed slightly. In 1981 the question was "Does it bother you..." and in 1992 "Does it occur..."

Table 2. Changes in mean levels of the sum variables of the physical and mental work demands in 1981 and 1992 among the men (N = 350) and the women (N = 574).

Type of demand	Men					Women				
	1981		1992		P-value	1981		1992		P-value
	Mean	SD	Mean	SD		Mean	SD	Mean	SD	
Muscular work	3.4	2.3	3.9	2.4	< 0.01	4.1	2.8	4.7	2.8	< 0.01
Work postures	3.8	2.9	4.4	3.0	< 0.01	4.6	2.9	5.3	3.1	< 0.01
Use of knowledge	5.9	2.9	6.4	2.3	< 0.01	5.4	2.9	6.3	2.4	< 0.01
Responsibility for people	6.9	2.8	7.0	2.5	0.40	7.6	2.7	8.0	2.4	< 0.01
Possibilities for development	5.4	2.4	5.9	2.3	< 0.01	5.6	2.4	6.4	2.2	< 0.01
Management	3.7	2.0	3.7	2.1	0.98	3.2	1.8	3.3	1.7	0.13

Table 3. Changes in mean levels of the sum variables of the physical work environment in 1981 and 1992 among the men (N = 350) and the women (N = 574).

Physical work environment factor	Men					Women				
	1981		1992		P-value	1981		1992		P-value
	Mean	SD	Mean	SD		Mean	SD	Mean	SD	
Work tools and rooms	3.4	2.1	2.7	1.8	< 0.01	3.6	2.3	2.9	1.9	< 0.01
Physical-chemical work environment	2.7	2.3	3.4	2.6	< 0.01	1.7	1.6	2.5	1.8	< 0.01

Direction of the work changes

All told, 21% of the men and 14% of the women reported that their muscular work had increased (figure 1). More men in the mental group (23%) than in the physical (20%) and mixed physical and mental group (15%) reported an increase in muscular demands. Seventeen percent of the women in mixed physical and mental work and 10% of those in physical work reported an increase. Very few reported that the muscular demands had decreased, although 8% of the women in physical work reported a decrease in muscular work. Among the women in all the work content groups the muscular demands had remained high more frequently than among the men (50% and 35%, respectively).

A little more than one-fifth of both the men and the women reported that their use of knowledge had in-

creased (figure 2). More men in physical (28%) than in mental (16%) work reported an increase. Among the women in mixed physical and mental work 28% reported an increase, and the corresponding figure for physical work was 20%. Only a few reported a decrease in their use of knowledge. Among approximately 40% of the subjects, the use of knowledge had remained high, most of the men being in mental work (68%) and most of the women being in mixed physical and mental work (55%).

About 16% of the men and 21% of the women reported an increase in their possibilities to develop and influence their own work (figure 3). A higher proportion of the women than the men (43 and 34%, respectively) perceived that possibilities to develop and influence their own work had remained the same. Among the men, 20% of those in mixed physical and mental work and 12% in

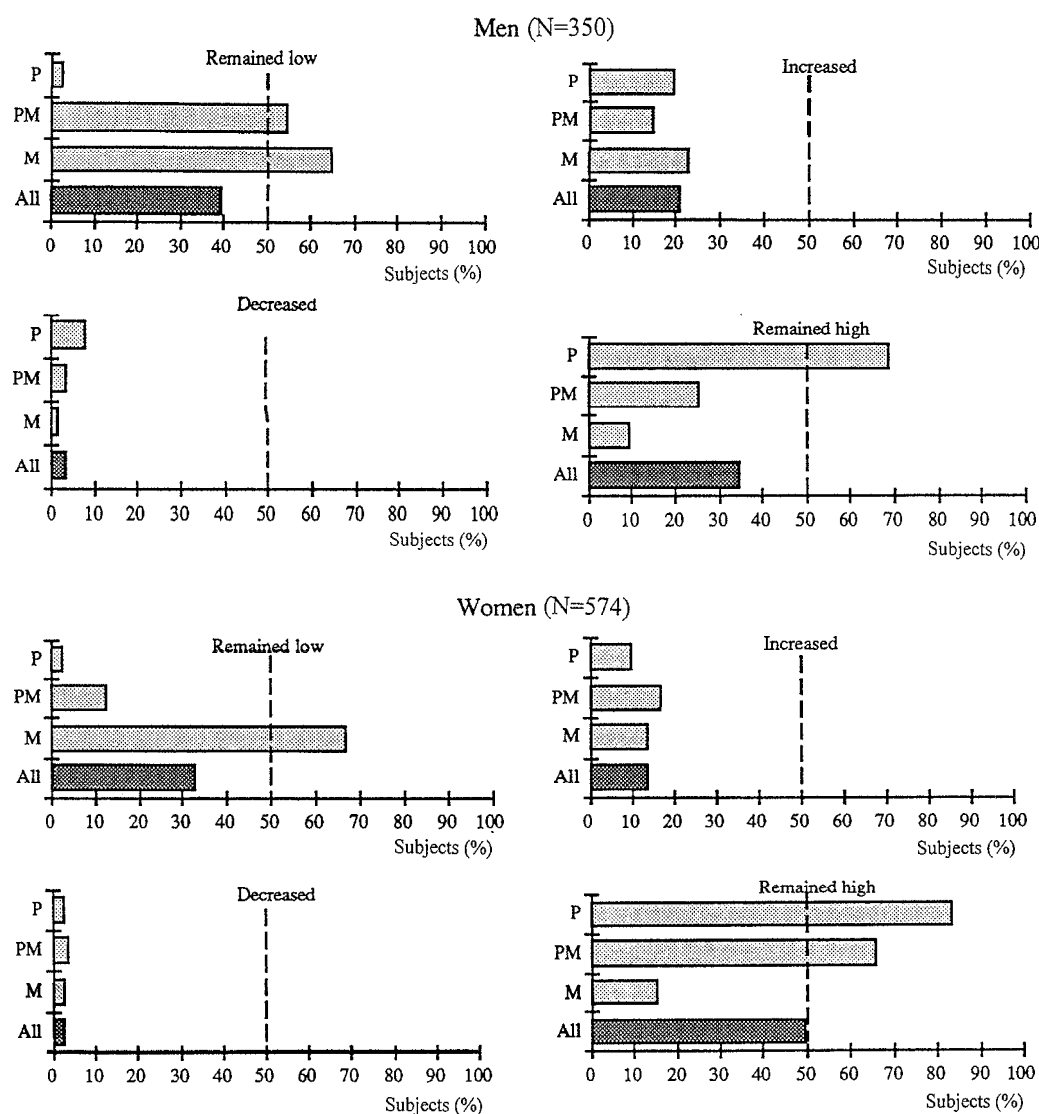


Figure 1. Changes in muscular work between 1981 and 1992 by gender and work category. (P = physical work, PM = mixed physical and mental work, M = mental work)

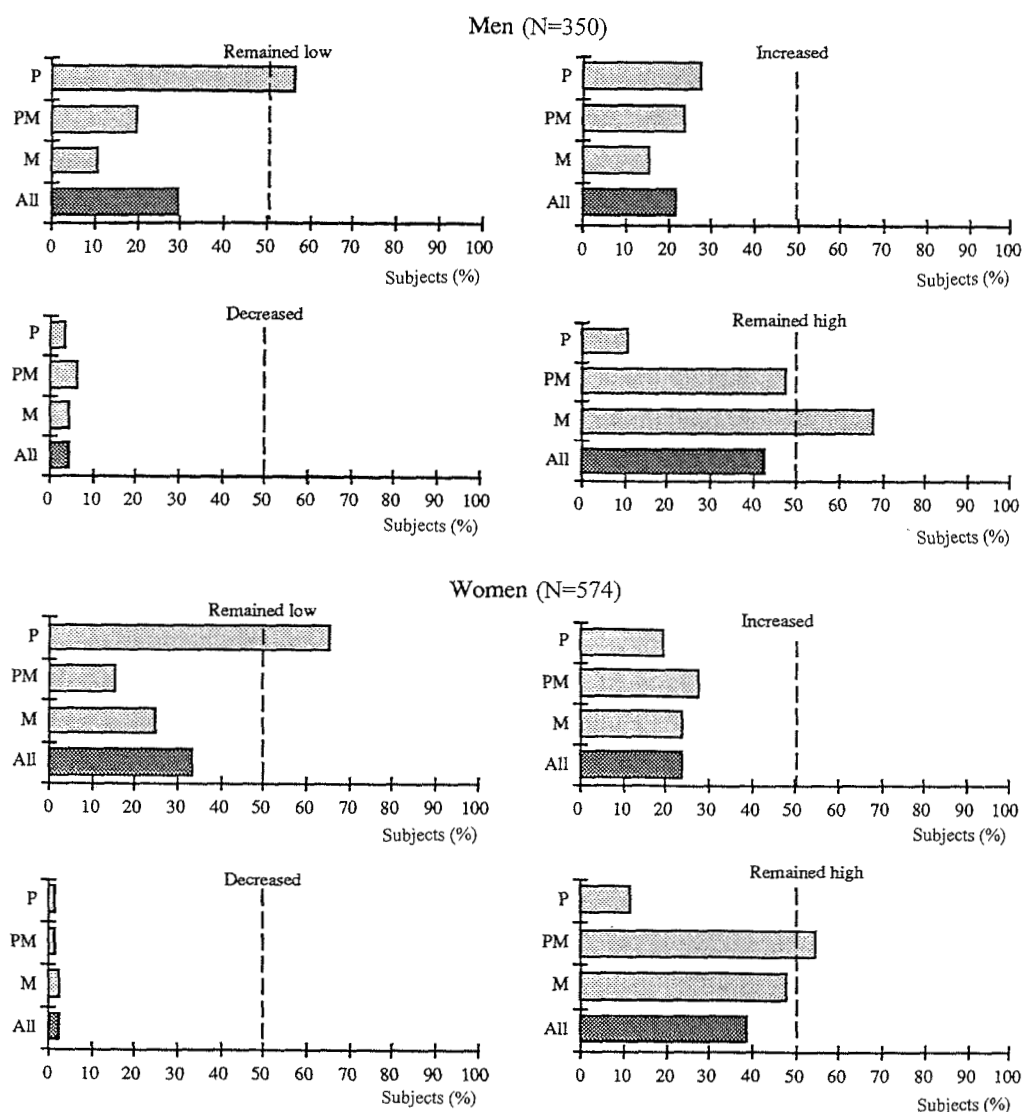


Figure 2. Changes in use of knowledge between 1981 and 1992 by gender and work category. (P = physical work, PM = mixed physical and mental work, M = mental work)

physical work reported an increase. Among the women, 29% of those in physical work and 14% in mental work reported an increase in their possibilities to develop themselves. In all, 6% to 15% of the subjects reported a decrease, most of them in mixed physical and mental work.

Discussion

The main result of the present study was that aging workers perceived that the physical and mental demands of their jobs had mainly increased from 1981 to 1992. The only exception was that the tools and workrooms were perceived to be better in 1992 than in 1981. The differences in the perception of the muscular demands

between the men and women had remained, but the difference in the use of knowledge had decreased. An increase in poor work postures and muscular work was reported more often by the men than the women, but the women still perceived higher physical demands than the men. The use of knowledge increased more among the men in physical work and women in mixed work than in the other groups. The women reported more possibilities to develop in their work than the men. The increase was especially marked among the women in physical work.

Our result agrees with those of some other Finnish cross-sectional studies of changes in worklife during the 1980s and early 1990s, when the work demands and stress factors, according to telephone interviews, had increased from the late 1970s to 1990 (8, 9) and from 1992 to 1994 (10).

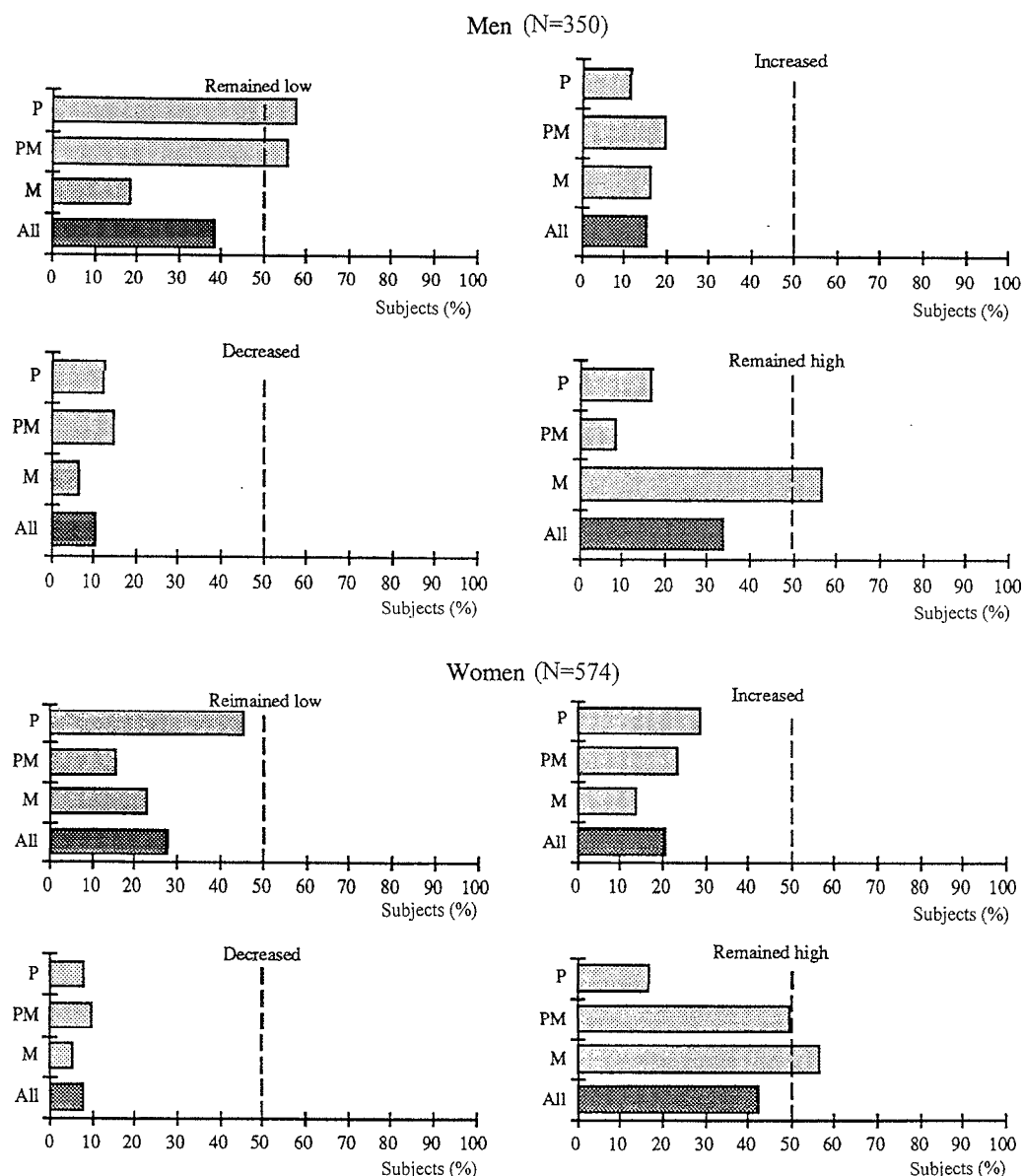


Figure 3. Changes in possibilities for development between 1981 to 1992 by gender and work category. (P = physical work, PM = mixed physical and mental work, M = mental work)

Our results do not exactly correspond with the results of another study of the development of municipal jobs in Finland, according to which individual worktasks had developed positively, while the problems with the social components of the work organization had increased (11). In our study, in which the subjects were close to retirement age, the workers perceived cooperation between the employer and employees and the management as very positive, although the number of those who were very satisfied with their own superior decreased slightly.

When looking for an explanation for our results, one must remember that those who had remained in the same job during the follow-up period, and mostly also in the same environment, were those who were positively se-

lected according to their work ability. None of them had retired on, for example, a disability pension. Therefore these results may give too positive a picture of the work environment, job demands, and their changes. The follow-up questionnaire was responded to in 1992 when the economic depression in Finland had just begun, and it was not yet at its worst. In a telephone interview in 1994 worklife and its changes had become even more negative (10). Accordingly, the work environment, relations at the workplaces, and opportunities to develop oneself had become worse, especially in the municipal sector. This finding may partly be explained by the fact that the total number of employees in the municipal sector in Finland had decreased by approximately 15% from the begin-

ning of 1991 to the end of 1993. On the other hand, the attitudes towards different aspects of the work among the employees in the governmental and private sector had become more positive (3).

The decrease in the perception of tools and work-rooms as stress factors was positive and may have been a result of different ergonomic improvements made in the last decade. The increase in the physical-chemical environment as a stress factor may be explained by a better awareness of environmental problems in the workplace.

It is thus not possible, according to our results, to draw conclusions concerning the entire municipal sector and, especially, concerning all ages. The employees' perceptions of the changes in their work show that no changes in work demands aimed at compensating for changes in capacity had been systematically made during the follow-up. Therefore, many of the older persons were working with a smaller reserve capacity than the younger workers were. The difference in work demands and capacity may be small, especially in physically demanding jobs (12) and in jobs which demand psychomotoric tasks, especially under time pressure (2). However, some areas of mental and social capacity, for example, verbal ability, wisdom born of experience, the ability to concentrate on essential matters and the ability to put oneself in another person's place — may develop with age and may influence those who work in contact with people so that their ability to cope with their job may influence workers' problem-solving and interacting abilities. This change depends on how stimulating the job has been and how the persons have solved problems as they occurred.

One interesting and important finding was that the changes in workers' perceptions of their work seem to be greater than the changes determined by job analyses made by researchers in the same study (13). The job analyses showed no major differences in the demands and stress factors of municipal occupations between 1981 and 1993. This finding agrees with the hypothesis that work demands do not necessarily change in parallel to the workers' capacity with increasing age (4). Thus the perceived changes in job demands may partly be explained by changes in the person with age. For example, workers' symptoms had a significant association with perceived changes in work (ie, the more the symptoms increased during the follow-up period, the more the work was perceived to have changed) (14). The true changes may be somewhere between these two results, and both demand consideration. An outside researcher may recognize the physical environment and physical demands, but not necessarily the mental demands. Therefore the changes perceived by the worker are very important. It is also difficult to study changes in worklife over time because the individual conception of the job (definitions of concepts and scales) may change. The meaning of the

same question and the interpretation of concepts may change over a decade. On the other hand, the possibility that the workers remember how they answered earlier is very small. In conclusion, we think that both subjective and objective approaches to the study of changes in work-life over time are important and both methods should be used in parallel, if possible.

The increased perception of muscular work during the follow-up may also be partly explained by the fact that physical capacity decreases with age and causes the worker to work with a higher relative load than earlier (15). Some of the gender differences in the perceived changes are interesting and important to note. The women reported a higher increase in their use of knowledge and their responsibility for people than the men did. This finding may partly be explained by the fact that the changes were the most marked among the women in mixed physical and mental work, which mainly contained nursing jobs. On the other hand, the possibilities to develop and influence work was perceived as greater among the women than among the men, especially in mixed physical and mental work, and this finding shows that also positive changes had occurred in the jobs. It is somewhat controversial that more mental workers than physical workers reported an increase in muscular work (17% and 14%) and also that fewer mental workers than workers in the 2 other groups reported an increase in their use of knowledge. This change may be due to a "ceiling" effect (ie, the physical workers already had high muscular demands and mental workers a high use of knowledge). In general the changes in the perception of work may be more connected with individual changes of the person than to changes in the work itself.

The results of our study suggest that the demands and stress factors of the work do not automatically decrease as the worker ages and work ability decreases. Therefore the demands and stress factors should be followed so that they can be balanced with the capacity of the aging worker.

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