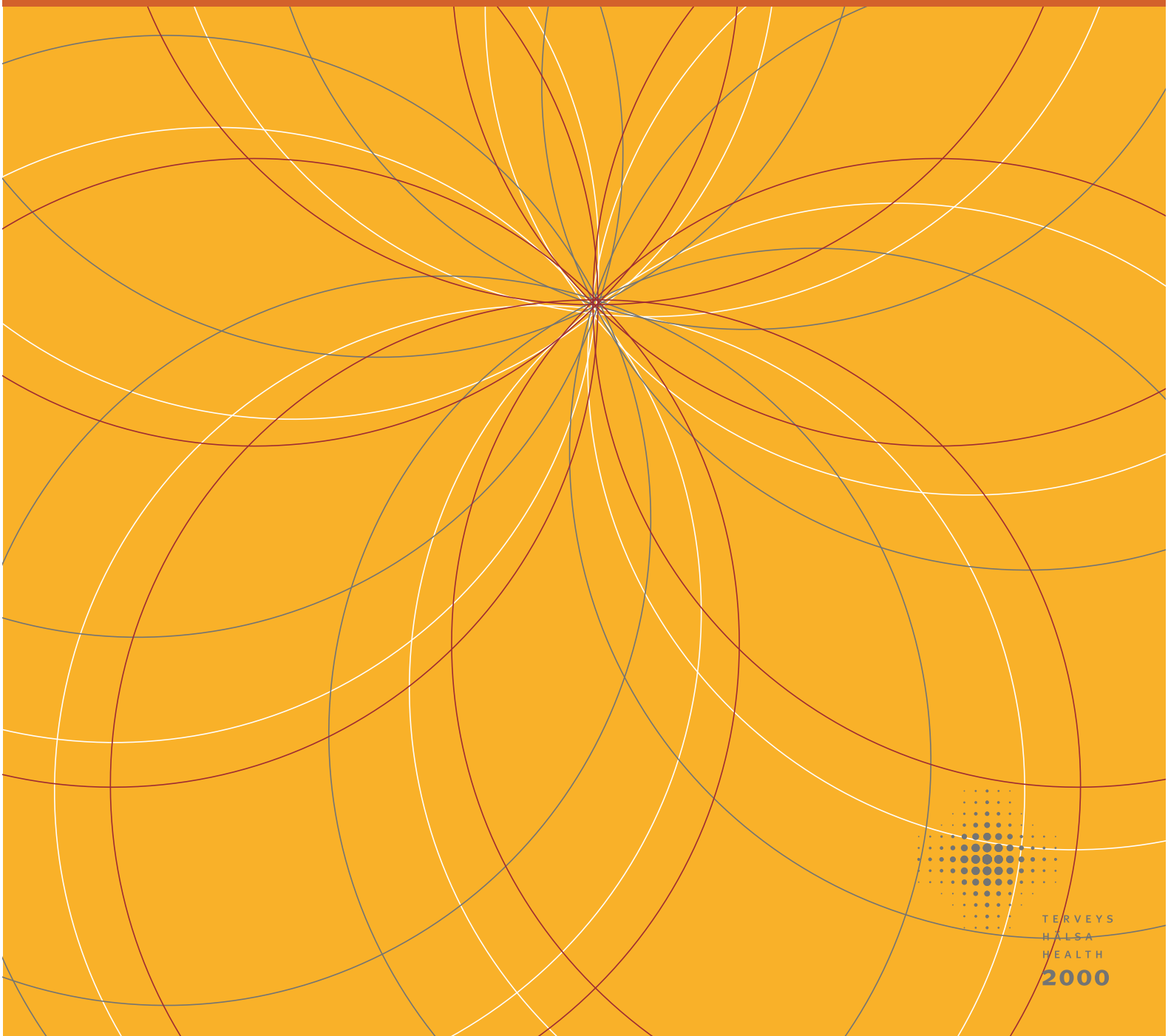
Helsinki 2008

Dimensions of Work Ability

Results of the Health 2000 Survey

Raija Gould, Juhani Ilmarinen,
Jorma Järvisalo and Seppo Koskinen, editors



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Publishers

Finnish Centre for Pensions (ETK)
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www.etk.fi

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PL 450, FI-00101 Helsinki, Finland
www.kela.fi

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Topeliuksenkatu 41aA, FI-00250 Helsinki, Finland
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ISBN 978-951-691-096-6 (printed book)
ISBN 978-951-691-097-3 (PDF)

Waasa Graphics Oy, Vaasa 2008

Preface

The focus on the population's work ability has changed over the years due to changes in working life, public health, population structure, culture and societal norms. Comprehensive and up-to-date knowledge on different dimensions of work ability is essential for the promotion of longer careers, employment growth and wellbeing of the population of working age and beyond.

This book provides baseline results on work ability of the Finnish Health 2000 Survey. It is the most comprehensive study on the population's work ability carried out in Finland.

The book is a product of a long and broad collaboration which started in the planning group of the research project already in the last millennium. The editors and authors of the book represent various organizations and disciplines as well as different angles of the research on work ability.

The book is an abbreviated version of the full Finnish-language report "Työkyvyn ulottuvuudet" published in 2006. The editors and authors shortened the original Finnish-language texts. They were then translated into English by Georgianna Oja. The translated texts were further edited by the editors, authors and other experts. We wish to thank all those involved in this process.

This report as well as the original Finnish-language report are available on the website of the Finnish Centre for Pensions at www.etk.fi.

We hope that the book provides to international readers valuable information on work ability and a source of inspiration for many new research projects.

The editors

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Abstract

Research on work ability is important from the perspective of the individual, work organisation and society. Good work ability increases wellbeing and supports employment. Knowledge on the different dimensions of work ability is necessary for regaining, maintaining and promoting work ability.

The purpose of this book is to provide a comprehensive overview of the work ability of the Finnish population. The book is based on the extensive data of the Finnish Health 2000 Survey. The focus is on the age group of 30 to 64 years; young adults and over 64-year-olds are addressed more briefly. The number of the 30- to 64-year-old participants was 5,199.

Most people of working age evaluated their work ability as good. Well-educated persons, white-collar workers and those living with families were most satisfied with their work ability whereas farmers, part-time workers and unemployed people often perceived their work ability to be limited. In all population groups work ability decreased with growing age. The oldest group of employed women, in particular, had many problems with work ability. Among young adults, the highest risks of limited work ability were unemployment, lack of sufficient basic education and mental problems.

Health and work were the most important determinants of work ability. Of the diseases investigated in this study, depression and back disorders decreased the work ability of employed people the most. Yet, also among those with no long-term illnesses, limitations in work ability increased with age.

Low physical work demands, support from supervisors and co-workers, control over one's work, and possibilities of development at work were related to good work ability. A suitable job seemed to ensure maintenance of work ability also among older workers.

In addition to work and health also expertise, skills and attitudes defined work ability. The relation of expertise to good work ability was, however, evident only among those with a higher education, a physically light job and good health.

A comparison with the data of the Mini-Finland Survey that was carried out at the end of the 1970s showed that work ability of the population had improved over a period of two decades. The simultaneous change in the population's educational level explained the decrease in work ability limitations among women and for the most part among men.

Contents

Raija Gould, Juhani Ilmarinen, Jorma Järvisalo, Seppo Koskinen

1 Introduction

Maintaining and promoting work ability is an important social objective. As changes in the structure and size of the population create challenges regarding the availability of the labour force and funding for social security, the importance of work ability will increase even further. The goal of the European Union to increase economic growth by promoting expertise and innovation and by making Europe an even more luring area for investments and work necessitates the holistic development and support of workers' work ability (COM 2005). Promoting the work ability of the working-age population also allows people to maintain their health and functional capacity longer into retired life and thus affects the quality of life of the growing population of retirees.

Research on the population's work ability is an important topic from the perspective of social goals. We need data on what factors comprise work ability in order to promote it. The forms and terms of work have changed during the past few decades. Physical labour has shifted more towards mental labour that increasingly involves working in networks. This shift, together with changes in the functional capacity, expertise, and attitudes of workers, is reflected in the content of work ability. Maintaining and developing work ability necessitates knowledge on the dimensions of work ability in modern society.

The extensive material that was collected in the beginning of this millennium as part of the Health 2000 Survey offers a good opportunity to examine the work ability of the Finnish population. The material lends itself well to describing the work ability of the Finnish population and its subgroups and to depicting the relations between work ability and other factors.

The purpose of this work is to provide an extensive description of the work ability of the Finnish population. We begin by examining the diversity of the term "work ability" (Chapter 2) and describing the data (Chapter 3). The first part of the results (Chapter 4) describes the work ability of different sectors of the Finnish population. An examination of subgroups of the population helps to identify the groups whose work ability is at risk of deteriorating. Chapters 5 and 6 examine the factors related to work ability. How are health, work, expertise and attitudes, for example, related to perceived work ability? Chapter 7 consid-

ers work ability in connection with unemployment, and, in chapters 8 and 9, we examine the extreme ends of the work career, young adults and aged workers. The theme of Chapter 10 deals with the time trends in work ability. The data from the Mini-Finland Survey that was conducted at the end of the 1970s is used for comparison in assessing how the work ability of the population changed over a period of two decades.

The last chapter summarizes the image obtained of the dimensions of work ability. The chapter also presents conclusions on what the results mean with regard to maintaining and promoting work ability and what they reveal with respect to the need for further study.

This book provides an important source of information for public policy by presenting detailed scientific knowledge on the factors that define the work ability of the population. We sincerely hope the results will serve as a stimulus and will provide useful information for researchers dealing with work ability, people that work in social security, rehabilitation and health care, and also others who plan and carry out actions to promote work ability.

Juhani Ilmarinen, Raija Gould, Aila Järvikoski, Jorma Järvisalo

2 Diversity of Work Ability

The concept of work ability has changed as society has developed. In this chapter, we survey the concept of work ability from the point of view of its evaluation and promotion and describe the integrated models of work ability that are currently in use.

Work ability is associated with nearly all factors of worklife, whether related to the individual, the workplace, or the immediate social environment or society. These versatile connections of work ability make defining it challenging and its promotion demanding. The purpose of this chapter is to give work ability a structure that serves as a uniform basis for further analyses in other chapters of the book.

In this book we consider the most important determinants of work ability to be health, functional capacity, expertise, values and attitudes, the many characteristics of work, and the immediate community of individuals and their life circumstances.

The demands of worklife in the beginning of the last century were fairly homogeneous. Physical strength and perseverance were essential. Morbidity was mostly related to the exhaustion of physical strength. Work disability was thus very concrete frailness that could easily be understood as the consequence of illness. As society has evolved, the forms of both work and morbidity have changed, and their interconnection has become more complicated to identify.

Thus, as changes in society have taken place, the definition of work ability has changed. We have shifted from a solely medical way of thinking to a model of balance between the demands of work and the resources of the individual and, further, to a multidimensional way of looking at work ability. This trend has been supported by the goal to lengthen work careers, together with the aim to detect deteriorating work ability as early as possible in order to prevent work disability. Concentrating on existing work ability and its preservation rather than on lost work ability creates a positive basis for actions and decision making in today's

world. The promotion of work ability presupposes focusing on worklife, work, and the individual.

Work ability and related factors can be studied from the point of view of the individual, the work organization, and also society. In the following section, we depict the versatility of the models used for work ability and their promotion from these three points of view.

2.1 Work ability concept

It is not easy to come up with a cohesive definition for work ability that the different practitioners, such as health care, institutes for pensions and rehabilitation, workers, employers, researchers, and legislators, would all accept. Work ability does not belong to one particular branch of science that could create an unequivocal meaning for it. In addition, the concept of work ability has constantly changed with time and further research. The more work ability, and its dimensions, has been studied, the more multidimensional and diverse its image has become. Accordingly, the evaluation, control, and promotion of work ability have become increasingly more challenging.

Several models have been used to examine work ability. Traditional models have focused on the medical aspects of health and functional capacity or on the importance of the balance between human resources and work demands. Recently, some multidimensional and integrated models have surfaced that not only include the traditional factors, but also such aspects as the work community, management, and the micro and macro environments outside worklife (e.g., Mäkitalo and Palonen 1994; Heikkilä 1996; Tuomi 1997; Järvikoski et al. 2001; Ilmarinen et al. 2005).

There seems to be a consensus that work ability cannot be analysed solely according to the characteristics of the individual. Work and the environment must also be taken into consideration. The way work and its related factors, as well as practitioners and their role, are determined plays a decisive role in how broad the concept of work ability will be. For example, according to the integrated concept, work ability cannot be explained solely by the relationship between individual prerequisites and the demands of work; instead it is a characteristic of a system that is formed in each concrete situation by the worker, the work, and the work organization (Mäkitalo and Palonen 1994; Järvikoski et al. 2001). The integrated concept of work ability emphasizes the context and time dimensions

of work ability. It stresses the fact, that it is generally not expedient to determine individual prerequisites for work ability or to promote work ability without context. If people cannot cope at work, it is often a result of poorly organized work processes, the lack of possibilities for workers to influence their work, poor cooperation, or time pressure.

Determining work ability solely according to objective criteria or expert evaluation is problematic because of the complex nature of the concept. Estimation by the individual is necessary to improve the results. In fact, subjective estimations have proved to be good predictors of future work ability and disability (Tuomi 1997). The determination is also influenced by whether work ability is examined from the view point of occupational health care, rehabilitation, social security benefits, unemployment, or some special characteristics of a specific occupation (such as the work ability of drivers). On the other hand, to be fair to the individual –for example, in the granting of social benefits –we need as uniform a definition for work ability and its influencing factors as possible.

Work ability also holds a key position in the programmes of national governments in several European Union member countries. The need to lengthen work careers to control the dependency ratio is an extremely current problem for the workforce of all the member countries. At the same time, the means to promote coping at work and continuing to work have become essential. It is hardly possible to lengthen workers' careers if workers are unable to work. Therefore, better understanding of work ability offers better and better possibilities to promote it.

It is the task of research to determine which factors affect or are associated with work ability and to clarify their significance as regards the different stages of a worker's career. Work ability is undeniably associated with almost all of the factors that describe individual resources and worklife, but the actual effect of the different factors on work ability needs further research.

2.2 Models for work ability and its promotion

Balance model for work ability

The balance model used for work ability is based on a stress–strain model (Rohmert and Rutenfranz 1983). According to this model, occupational stress creates strain within the individual. The quality and level of the strain is regulated by the resources of the individual. It is possible to evaluate how well a person's resources correspond to the demands of work by examining the degree of strain.

The stress–strain model emphasizes the significance of both the differences between people in worklife and the need to find a balance that safeguards the health of people and their coping at work. The model includes both too much and too little strain and their prevention, for both are associated with work, conditions at work, and the resources of the individual (Ilmarinen et al 1991b; Mäkitalo and Palonen 1994).

For work ability, the balance model signifies a constant search for balance between people and their worklife. The criteria for finding that balance could be, for example, the preservation of health, work ability, and occupational well-being and coping at work. An imbalance could be depicted by work-related symptoms or diseases and an overload of different subjective, psychosomatic, physiological, or biochemical factors. Succeeding at worktasks and productivity are also criteria for evaluating work ability.

The balance model is also dynamic. The level of a person's strain is affected by the interactions between factors of the work community and the workers, as well as by the developing elements of work. The strain can be positive, as when it maintains and develops the resources of the person, or negative, as when it causes ability and well-being to decrease. The model also contains the idea of reaching a balance either by supporting workers' resources or planning work processes or conditions so that they are as suitable as possible for workers. The balance model is still commonly used by experts in defining occupational work ability or disability.

Multidimensional work ability model: coping at work, control over one's work and participation in the work community

The multidimensional work ability model, developed by the Rehabilitation Foundation in Finland (Järvikoski et al. 2001), can be described as a combination of the balance model and the integrated concept of work ability. The basis for the model is individual prerequisites for coping and surviving in worklife, but it also emphasizes the role of work and the work organization in the fruition of work ability.

The model defines coping at work, having control over one's work, and participating in the work community as important dimensions of work ability (Table 2.1). The model attempts to depict work ability holistically rather than in terms of the separate factors that affect it. As in the balance model, each dimen-

sion is examined on the basis of the relationship or tension between individuals' resources and work. At the same time, this model attempts to take into consideration also the contexts in which decisions concerning work, equipment, and the work organization are made.

Table 2.1. *Multidimensional work ability model: coping, control, participation.*

Worker		**Work**	**Task of the work organization and functional environment**
Physical and mental capacity, endurance	Coping at work	Physical and mental strain of the work process or work conditions (resources and weaknesses)	Business concept, solutions for the distribution of worktasks, work conditions and processes in the organization
Occupational skills and competence	Control over one's work	Cognitive prerequisites and skills for the work process; possibilities to affect work, learn from work and develop in work	Occupational roles and their cognitive and skill prerequisites; equipment; personnel's opportunities to influence, learn and develop
General skills in worklife and social skills; skill in applying for work; interests	Participation in the work community	Prerequisites for surviving in the work community; opportunities to participate socially; social support; diversity of work roles	Organization's values and attitudes (e.g., acceptance of diversity and multiculturalism): atmosphere of the work community; practices concerning recruiting and promoting careers

Source: Järvikoski et al. 2001.

On the individual level the different dimensions signify physical and mental resources, expertise and general social skills, and the skills needed in worklife. The way work ability is manifested is also dependent, however, on the work or profession to which individuals contribute, as well as on the functional environment in which the framework for work (occupational roles, work equipment and processes, and forms of cooperation) is defined. Each work organization can reach its goals with different means and by using different solutions to distribute worktasks. The organization can also use the contribution of its employees in

different ways, ways that either support their coping and performance at work or hinder it.

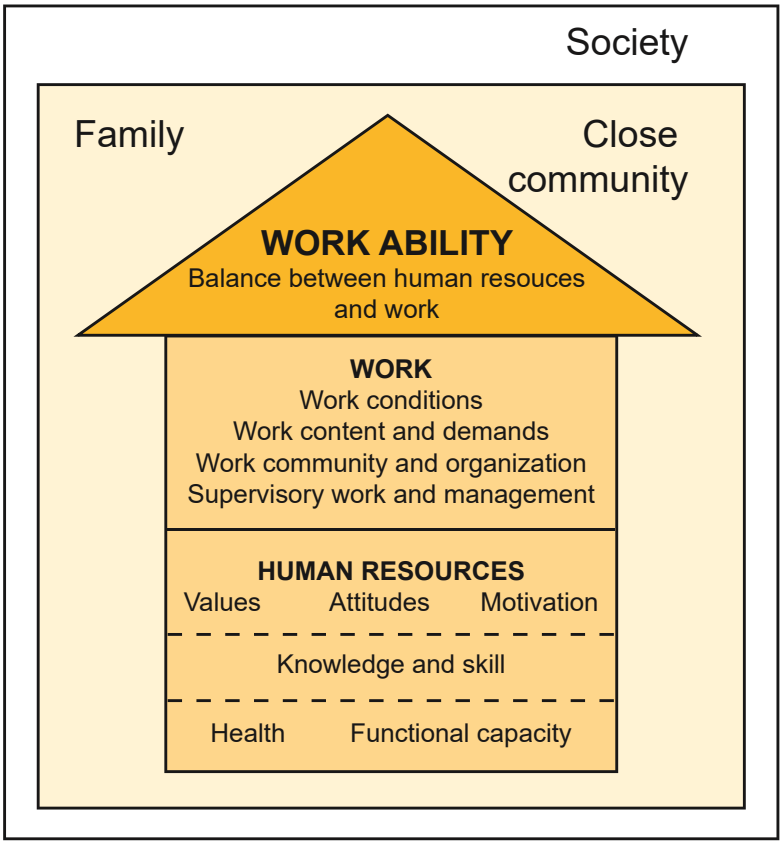
The three dimensions of work ability (coping, control, and participation) are constantly interacting. For example, in the area of having control over one's work, a disproportion between workers' skills and the norms and demands of the work community often causes continuous stress, repeated failures, or, on the other hand, frustration and a lack of appreciation of one's work. In the long term, such tension may evolve into risk factors for health and personal fitness (Karasek and Theorell 1990). But before this point is reached, workers' contributions can be impaired, and their ability to cope at work can decrease. Respectively, problems with coping at work may manifest themselves as problems in controlling the work process or in an unusually strong need for social support. Poor organization of the work process, unclear distribution of worktasks, and strict norms for uniformity may be reflected at several different levels of workers' work ability simultaneously.

Many times the conflicts between controlling one's work and participating in the work community are noted only when they manifest themselves as problems with coping at work. If the problems are interpreted at that point as being primarily related to the psychophysical situation of the employee, the means to correct the situation may be too oriented towards medical or health care solutions, and a broader analysis of the situation may be ignored. The multidimensional model attempts to emphasize a broad interpretation of coping and surviving at work and take into consideration the potentials of the work organization in solving individuals' problems.

Multidimensional work ability model: individual resources, work, family, close community and society

The holistic work ability model developed by the Finnish Institute of Occupational Health in Helsinki is primarily based on several studies and development projects conducted in the 1990s on occupational well-being in different industrial sectors and among different age groups. The holistic image of work ability consists of both the resources of the individual and factors related to work and working and the environment outside of work (Ilmarinen and Tuomi 2004; Ilmarinen 2006). The dimensions of work ability can be depicted in the form of a work ability house, its floors, and the surrounding environment (Figure 2.1).

Figure 2.1. *Dimensions of work ability from the point of view of human resources, work, and the environment.*



Source: Ilmarinen 2006.

In the core structure of work ability, the resources of the individual form the first three floors. They are comprised of health and functional capacity, professional expertise, and values and attitudes, respectively. The fourth floor is that of work, which consists of the work environment, the content and demands of work, the work community, and the work organization. Supervision and management are also part of the fourth floor. In the immediate surroundings of the work ability house are the organizations that support work (e.g., occupational health care and safety), as well as the family and the close community (relatives, friends, acquaintances), for example. The outermost layer is society, whose infrastructure and social, health, and occupational policies and services form the macro environment of work ability.

The first floor of the work ability house is comprised of human resources such as health and physical, mental, and social functioning. The sounder the foundation,

the stronger work ability will be throughout a person's worklife. The second floor of the house is constructed from knowledge and skill and their continual updating through, for example, life-long learning. The third floor depicts the inner values and attitudes of persons as well as factors that motivate them in the worklife. Attitudes and values are close to the work (fourth) floor. Experiences from work first affect workers' values and attitudes. Good experiences strengthen positive values and attitudes towards work, and bad ones weaken them.

The fourth floor (i.e., work and all of its dimensions) is the largest and heaviest floor of the work ability house. It actually sets the standards for the other floors. If the resources of the individual are in balance with this floor, work ability will remain good. If workers' resources are not in proportion with the size or functionality of the work floor, work ability will deteriorate. Managers can play a key role in influencing this balance by developing and organizing the fourth floor according to the prerequisites of the workers. The importance of managers in supporting individual workers' work ability has been shown in longitudinal studies (Tuomi 1997).

The core structures of work ability change considerably during a person's career. Ageing changes workers' resources, and worklife is changed, for example, by the introduction of new technologies and the influence of the global economy. From the point of view of preserving work ability, it is vital to strive for a healthy and safe balance between work and human resources. The core structures of work ability are, however, in constant interaction during which positive and negative processes influence the level of work ability. Therefore, nurturing work ability requires simultaneous knowledge of many processes.

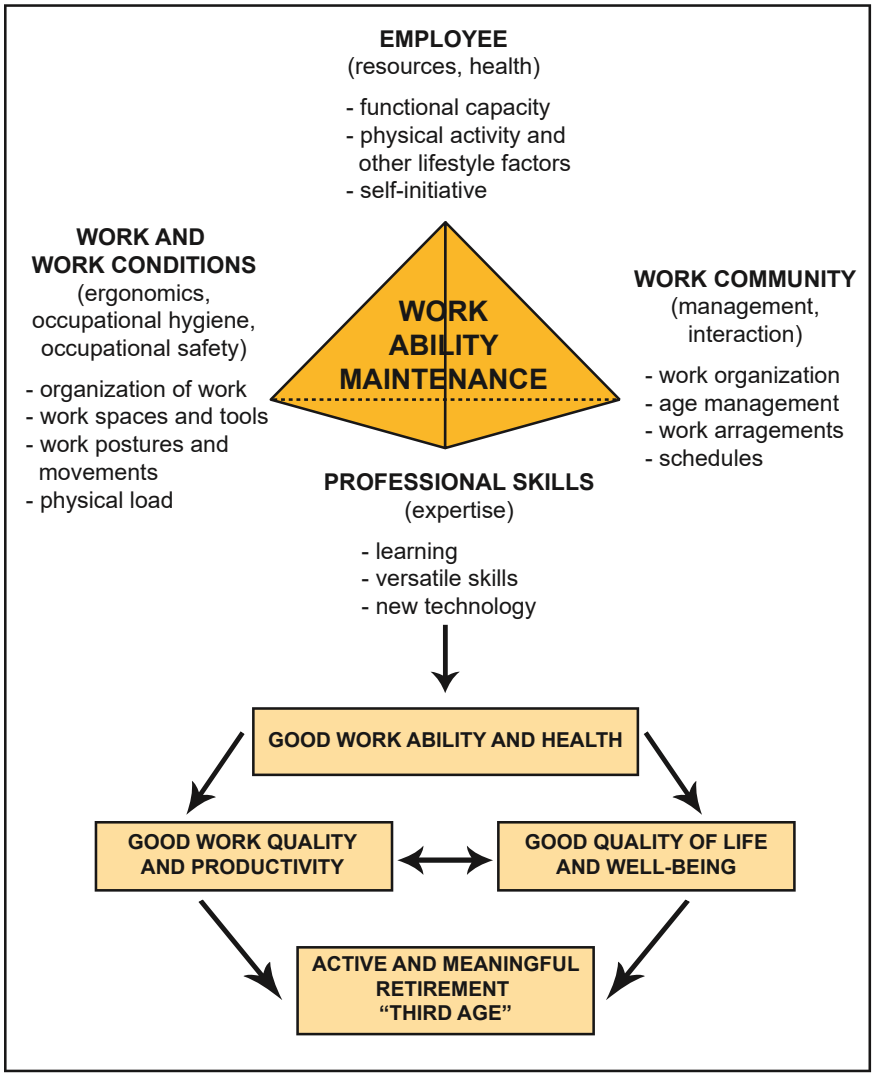
The diversity of work ability and the limited possibilities for people to control their work ability call for the active support of occupational health care and safety. The need for health and work ability services grows along with ageing, and the role of supportive organizations in the workplace becomes more important as the workforce grows older.

The family and immediate community can also support the work ability of the individual. A reconciliation between family life and work is essential for work ability. At the society level, the labour market parties create the rules for working. Work, health, and educational policies play their part in creating significant prerequisites for work ability, but they also create challenges for it by, for example, demanding a higher employment rate.

Model for the promotion of work ability

The purpose of defining work ability is to recognize its level and to assess actions to maintain and promote it. On the other hand, maintaining and promoting work ability require versatile actions both to strengthen the resources of the individual and to develop work and its environment. In this activity the aspects for development have been grouped into the work environment (e.g., ergonomics, occupational hygiene, and occupational safety) and the work community (psychosocial factors, work organization, interaction, and supervisory work). The factors concerning individual resources have been organized into 1) health and functional capacity and 2) professional skill and knowledge (expertise) (Figure 2.2).

Figure 2.2. *Tetraedric model for promoting work ability.*



Source: Ilmarinen 2006.

According to numerous projects, examining and prioritizing the needs of work ability promotion and the integrated execution of the needed actions have improved work ability, health, and expertise among workers regardless of industrial sector, age and gender (Ilmarinen 1999 and 2006). These actions have influenced productivity and the quality of work, as well as the quality of life and well-being of the individual. The effects of promoting work ability have carried into the quality of life in what has come to be known as the third age. This emphasizes the long-term effects of investments in work ability during worklife (Tuomi et al. 2001).

2.3 Evaluation and measurement of work ability

The diversity of work ability makes its evaluation and measurement a challenge. It has been argued that, at best, work ability can be evaluated more or less consistently, but that exact measurement can never take place (Lahtela 1983). One basic question in evaluating work ability is the perspective from which it is evaluated. In research, a variety of perspectives can only be an advantage, but, for the purpose of social insurance, for example, many perspectives may create problems.

The evaluation of work ability can thus be based on the person's own views, or it can be made by health care or social insurance professionals or other experts. Management can also evaluate workers' performance in practical situations at the workplace. In a work ability assessment made by social insurance officers, the main emphasis is on the worker's health and functional ability. When work ability is being promoted at the workplace, the evaluation can, however, be much more diverse, and it can also take into consideration organizational aspects and the work community, in addition to the worker's functional capacity and work. In this case, the goal of the evaluation is to develop the operational system, and the work ability of the individual is only part of the system as a whole (see Mäkitalo 2003).

Evaluating work ability can be rather simple if the objective is to assess the health requirements for a certain task. On the other hand, the many practices of modern worklife that require versatility, flexibility, and social and communicative skills or that involve unstable jobs and limited employment possibilities create a challenging environment for evaluating work ability. For example, it is difficult to assess the work ability of the unemployed because they have no job

and, without a job, there is not a standard for work ability (Rajavaara et al. 2000; Gould 2001).

Research, especially surveys, often uses measures with which people can evaluate their own work ability. Such measures can be used as abstract, general indicators of work ability that are based on the conception people have of their own ability to work. On the other hand, measures can also be more concretely related to people's circumstances. They can measure the way in which people perform in their current jobs, they can measure work ability in comparison with work ability earlier in people's careers, or they can compare workers' work ability with the abilities of workers of the same age in similar tasks. Many studies approach work ability also from its different dimensions. The work ability index (see Chapter 3) is an example of a work ability measure that combines several dimensions of work ability.

2.4 Work ability in this study

In this book, we examine work ability especially from the point of view of a population study. We study the work ability of the Finnish population and its subgroups and examine how work ability has changed during the last couple of decades.

In the next chapters, work ability is defined on the basis of the individual's experience. It is measured through questions that have been used for a long time in Finnish studies of work ability. The indicators of work ability are examined in more detail in the following chapter, which introduces the study material.

Even though work ability is examined using the perceptions of individuals, it is not a question of strictly individual characteristics. Perceived work ability is not only closely linked with the worker, but also with the work. In this study the dimensions of work ability that are related to work, organization, and a broader social context are mediated to the concept of work ability through the experience and assessments of the worker.

We attempt to describe the diversity of work ability according to the core structures and environment of the work ability house presented in Figure 2.1. Our intention is to determine the most important factors related to work ability and to further define the dimensions of perceived work ability.

The aim of this book is to produce a better understanding of work ability and to identify its different dimensions. The new information on the dimensions of work ability can be used to help maintain and improve work ability and to cultivate methods with which to evaluate it.

Raija Gould, Seppo Koskinen, Jorma Seitsamo, Kaija Tuomi, Anu Polvinen, Päivi Sainio

3 Data and Methods

The Health 2000 Survey was based on a nationally representative sample of the Finnish adult population. The data collection comprised an interview, questionnaires and a comprehensive health examination. The focus of this book is on the age group of 30 to 64 years; young adults and over 64-year-olds are addressed more briefly. The number of the 30- to 64-year-old participants was 5,199, i.e. 89 per cent of the sample in this age group.

Three main indicators of work ability were used in this study: a three-level self-evaluation of work ability, a work ability score and the work ability index. All three indicators were strongly related to health, motivation and work load. The connection to expertise was weaker.

3.1 Study population

Dimensions of Work Ability is part of the *Health 2000 Survey*. The object of the Health 2000 Survey was to gather up-to-date information on the most important diseases, their causes, and treatment in Finland, as well as data on the work ability and functional capacity of the Finnish adult population. A broad network, coordinated by the National Public Health Institute of Finland, was assembled for the project to plan and carry out this research (Aromaa and Koskinen 2004).

The target population of the Health 2000 Survey consisted of all people aged 18 years or older who reside on the Finnish mainland. The sample was drawn from this population with a two-stage stratified cluster sampling procedure (Aromaa and Koskinen 2004; Laiho and Nieminen 2004; Heistaro 2008).

The data were gathered between September 2000 and July 2001. The data collection for those aged 30 years or older involved a home interview, a health examination, and self-administered questionnaires. The information on those 18 to 29 years of age was gathered with the use of interviews and questionnaires. The

different phases of the study have been described in the baseline report (Aromaa and Koskinen 2004), in a report on the methods (Heistaro 2008), and on the home page of the project (www.ktl.fi/health2000), where the interview and questionnaire forms are also available.

In order to maximize participation, condensed versions of the health examination and, if necessary, the interview were administered at home to as many of those who did not participate in the health examination proper as possible. In addition, telephone interviews and post-administered questionnaires were used to gather information from people who had not participated in the interview or the health examination (Aromaa and Koskinen 2004; Heistaro 2008).

Almost all of the information on work ability, health, and functional capacity was gathered in the interview. Some of the information on work was obtained in the interview, and some came from the questionnaires. Of the information gathered in the health examinations, this report makes use of the measured results on cognitive functioning and the height and weight of the participants.

The original sample consisted of 9,922 persons, of which 1,894 were 18- to 29-year-olds and 8,028 were 30 years of age or older.

Overall, the participation in the study was excellent. Altogether 79 per cent of the young adults and 87 per cent of those aged 30 years or older were interviewed. In addition, 84 per cent of those aged 30 years or older participated in the health examination proper or underwent a health examination in their homes. When the data from questionnaires, telephone interviews, and post-administered questionnaires are taken into account, the most important information concerning health and functional capacity were obtained for 93 per cent of those aged 30 years or older and 90 per cent of the 18- to 29-year-olds.

Those aged 75 years or older were not asked questions on work ability; thus the oldest members of the study population were not included in this material. Most of this report concentrates on persons who were between 30 and 64 years of age. Of them, 89 per cent participated in the interview, 86 per cent answered the basic questionnaire, and 86 per cent participated in the health examination. Specific data on participation are presented in Table 3.1. Due to the high participation rate, the material of this study offers a good representation of the Finnish adult population. In addition, the representativeness of the data was improved by weighting. (See Section 3.3.)

Table 3.1. *Study population and participation in the interview according to age group.*

Age group	Women			Men		
	Sample	Participation in interview		Sample	Participation in interview	
		Number	%		Number	%
18–29 years	913	738	81	981	765	78
30–44 years	1353	1211	90	1316	1105	84
45–54 years	957	876	92	963	842	87
55–64 years	670	616	92	612	549	90
65–74 years	571	507	89	422	384	91
30–64 years	2980	2703	91	2891	2496	86

3.2 Work ability indicators

In this study, work ability was defined according to the participants' own evaluations. Work ability was determined through the use of questions on the participants' own estimations of their work ability. The questions have been used consistently in Finnish studies of work ability. The following three indicators of perceived work ability were used in this study: a three-level self-evaluation of work ability, a work ability score of 0 to 10 points, and the work ability index, which consists of several items, including the work ability score.

Work ability estimate

In the three-level assessment of work ability, the participants were asked to evaluate their work ability regardless of whether they worked or not. The options were 1) completely fit for work, 2) partially disabled for work, and 3) completely disabled for work. This phrasing was first used over 20 years ago in the Mini-Finland Health Examination Survey. From this point on in this report, the three-level work ability assessment will be referred to, in short, as the "work ability estimate". In addition, the participants have generally been divided into those with *full work ability* (those who are completely fit for work) and those with *limited work ability* (those who are partially or completely disabled to work).

The work ability estimate was constructed in such a way that it could be presented also to people who were not in worklife at the time of the study. Thus it was used to assess work ability in the home interview of all those under 75 years

of age. If interviewees had trouble answering the original question, they were asked to evaluate their work ability in relation to their most recent job. It was also possible to compare the results of the Mini-Finland Survey that was carried out in 1978–1980 with the results of the Health 2000 Survey because the questions on self-reported work ability were identical in the two studies.

Work ability score

Another indicator of work ability that was frequently used in this study was the score from 0 to 10, which indicated current work ability. The participants were to compare their current work ability with their best lifetime work ability so that a score of 0 represented full work disability and a score of 10 indicated work ability at its best. This assessment is hereafter referred to as the "work ability score". The question concerning the work ability score was presented to all those under 75 years of age who participated in the home interview and who had been employed at least at some point of their life. Therefore, it could be used in the study nearly as widely as the three-level work ability estimate.

Work ability index

A third important indicator of work ability was the "work ability index". It was developed in a follow-up study that involved ageing municipal workers in different types of occupations (Ilmarinen et al. 1991b and 1991c; Tuomi 1997).

The work ability index is based on a series of questions that take into consideration the physical and mental demands of work and the health and resources of the employee (Tuomi et al. 2006). The work ability index consists of the following seven items:

1. *Current work ability compared with the lifetime best* comprises the work ability score that is often used as a separate indicator of work ability and has been described above (0–10 points).
2. *Work ability in relation to the demands of the job* (2–10 points).
3. *Number of current diseases diagnosed by a physician* (1–7 points).
4. *Estimated work impairment due to diseases* (1–6 points).
5. *Sick leave during the past year* (1–5 points).
6. *Own prognosis of work ability two years from now* (1, 4 or 7 points).
7. *Mental resources* (1–4 points).

The work ability index is calculated by summing the points of the seven items (the possible score ranging from 7 to 49 points). The index can be divided into the following four classes: poor (7–27 points), moderate (28–36 points), good (37–43 points), and excellent (44–49 points) (Tuomi et al. 2006).

Some of the questions in the work ability index can be applied only to people in worklife. Therefore, the index could not be used to determine work ability among the entire study population, but instead was used for the work ability of those who had been working during the previous 12 months. The fact that the information for the different sections of the index was gathered during different stages of this study also restricts its use somewhat. The information for items 1–6 was gathered through the interview process, but the information on mental resources (item 7) was gathered in the questionnaire, for which the rate of participation was somewhat less than for the interview. The reliability of the work ability index in terms of Cronbach's alpha was 0.78. The first item (the work ability score), the second item (work ability in relation to the demands of the job), and the fourth item (estimated work impairment due to diseases) of the work ability index had the greatest impact on its value.

Distribution of the work ability indicators

The distributions of the three indicators of work ability, the "work ability estimate", the "work ability score", and the "work ability index" are presented in Table 3.2.

Most of the employed participants had a work ability index that indicated good or excellent work ability. The four-category classification of the work ability index corresponded best with work ability scores classified as follows: excellent (10 points), good (8–9 points), moderate (6–7 points), and poor (0–5 points). Only in the oldest group of employed women did the distribution of the four-category classification of the work ability score not correspond to that of the work ability index. Among the 55- to 64-year-old women, 60 per cent were rated as having excellent or good work ability by the work ability index, whereas 77 per cent had excellent or good work ability (8–10 points) according to the work ability score (Table 3.2).

The three-level work ability estimate showed rather poor differentiation between the employed participants in that 99 per cent of the 18- to 29-year-olds and most of those aged 30 years or older stated that they were completely fit for

Table 3.2. *Distribution (%) of the work ability index, the work ability score and the work ability estimate according to gender and age.*[1]

	Women					Men				
	18–29	30–44	45–54	55–64	65–74	18–29	30–44	45–54	55–64	65–74
EMPLOYED WORKERS										
Work ability index										
Excellent	48	32	16	8		59	39	23	18	
Good	47	57	60	52		37	51	54	52	
Moderate	5	10	21	31		4	8	19	22	
Poor	0	1	3	9		0	1	4	8	
Total	100	100	100	100		100	100	100	100	
Number	348	839	663	225		398	868	614	192	
Work ability score										
10 points	46	39	19	11		53	41	21	13	
8–9 points	49	54	68	66		42	51	60	56	
6–7 points	4	6	9	19		4	7	16	24	
0–5 points	0	1	4	5		1	1	3	7	
Total	100	100	100	100		100	100	100	100	
Number	386	912	704	237		512	950	674	215	
Work ability estimate										
Completely fit for work	99	96	90	81		99	97	90	87	
Partially disabled for work	1	4	10	18		1	3	9	11	
Completely disabled for work	0	0	1	1		0	0	1	2	
Total	100	100	100	100		100	100	100	100	
Number	386	913	705	237		513	949	677	215	
TOTAL POPULATION										
Work ability score										
10 points	48	39	18	6	0	53	39	18	7	2
8–9 points	46	52	63	43	29	42	49	53	37	21
6–7 points	5	7	11	29	34	4	8	18	27	37
0–5 points	1	3	8	23	37	2	4	11	29	41
Total	100	100	100	100	100	100	100	100	100	100
Number	734	1205	868	604	492	757	1097	835	539	374
Work ability estimate										
Completely fit for work	97	94	83	53	30	97	92	80	55	33
Partially disabled for work	3	5	13	31	49	3	5	11	31	46
Completely disabled for work	0	2	4	15	21	1	3	8	15	21
Total	100	100	100	100	100	100	100	100	100	100
Number	735	1210	871	612	500	764	1104	840	543	380

[1] The distributions for the employed 65- to 74-year-olds have not been presented due to the small size of the group.

work. On the other hand, the three-level estimate proved to be a better indicator of the work ability of the entire study population, especially that of the older persons. Approximately one third of the oldest age group, the 65- to 74-year-olds, was completely fit for work according to the work ability estimate, almost half of them were partially disabled for work, and one fifth was completely disabled. About 55 per cent of the 55- to 64-year-olds and most of the under-55-year-olds reported that they were completely fit for work (Table 3.2).

Despite the fact that the distributions of the work ability score and the work ability index differed from those of the three-level work ability estimate, the association was strong. Both the work ability index and the work ability score were decidedly higher for the participants that reported being fully able to work (completely fit for work) than for those with limited work ability (partially or completely disabled for work) (Table 3.3).

On the other hand, not all of the participants who reported being able to work received the highest points according to the work ability score or the work ability index, and, at the same time, some of those who estimated their work ability as limited belonged to the highest categories according to the work ability score or the work ability index. In addition, many of those who reported being partially disabled for work gave themselves at least 8 points with regard to their current work ability when compared with their lifetime best. In these cases, it is possible that the participants had never regarded their work ability as being very good and, therefore, estimated their work ability as being close to their lifetime best.

Table 3.3. *Age-adjusted distributions (%) of the work ability index and the work ability score among the employed 30- to 64-year-old participants according to their work ability estimate.*

Work ability index	**Work ability estimate**		**Work ability score**	**Work ability estimate**	
	Those fully able to work	Those with limited work ability		Those fully able to work	Those with limited work ability
Excellent	28	0	10 points	30	3
Good	58	16	8–9 points	61	31
Moderate	13	52	6–7 points	8	41
Poor	0	32	0–5 points	0	25
Total	100	100	Total	100	100
Mean	40.9	30.0	Mean	8.8	6.4

3.3 Statistical methods

Two-staged stratified cluster sampling was used in the Health 2000 Survey. This sampling design creates special demands for statistical analyses. Because of the clustering, the observations in the same cluster are not independent. The stratification and clustering were taken into account in the analyses. In addition, the observations were weighted to reduce bias due to different sampling probabilities and non-response. Thus the results of the study can be generalized to represent the basic target population (Djerf et al. 2004).

For the most part, cross-tabulation and logistic and linear models were used for the statistical analyses. The unadjusted prevalence values and means of the age groups were generated by cross-tabulation, whereas the age-adjusted prevalence values and means were estimated by logistic and linear regression models with the predictive margins approach (Graubard and Korn 1999). The t-test was used for the statistical testing of the differences between the classes of explanatory factors. In some analyses, the responses of the men and women were analysed in the same model to make the age-adjusted values comparable between the genders. When the effect of an explanatory factor was studied in the classes of a third factor, the responses of the men and women were analysed separately. In such cases, the prevalences and means of the men and women were not comparable due to confounding factors such as age.

Correlation and factor analyses, as well as structural equation models, were also used. Factor analysis was used to form the factor score variables that were related to different aspects of work ability, such as the dimensions of the work characteristics. Structural equation models were used to explore the dependences between the variables (Chapter 6). In addition, the relations between the variables and the work ability index were also studied using a backward stepwise regression model.

SAS, SUDAAN, Stata, and Lisrel programs were used in the statistical analyses.

The results are presented as tables and figures. Most of the tables present the prevalences or means of the different age groups, the age-adjusted prevalence values and means for the 30- to 64-year-olds, and odds ratios based on a logistic model.

4 Work Ability in Different Population Groups

Work ability varies in different sectors of the population. According to this study, young and well-educated people perceived their work ability to be better than those who were older or had less education. Moreover, widows and single or divorced men reported more problems concerning work ability than those who were married. Limited work ability was reported more often by those who did not hold a job than by those employed. Furthermore, among the employed persons, those with full-time jobs perceived their work ability to be better than did those who held part-time jobs, and white-collar workers reported better work ability than blue-collar workers did. Agricultural workers gave the poorest estimate of their work ability.

Different subgroups of the population need programmes tailored to meet their own prerequisites with respect to regaining, maintaining, and promoting work ability.

Studying work ability in different population groups can help identify groups whose work ability is in danger of prematurely deteriorating and who should, therefore, receive special attention. In addition, knowledge of the subgroups with excellent work ability can be used to promote the maintenance of work ability among the entire population.

The differences in work ability should also be examined from the point of view of equality. For example, health disparities between population groups are considered to reflect inequality when the difference could potentially be narrowed. Even though reducing inequality has been one of the primary goals of Finnish health policy programmes for the last few decades, the goal has only partially been reached (Valkonen et al. 2000; Ministry of Social Affairs and Health 2001; Martelin et al. 2006).

The same train of thought can also be applied to the inequality related to the work ability of different subgroups of the population. Actions to promote work ability are not necessarily directed equally towards different population groups. Such actions have generally been implemented the best in growing branches of

industry and in successful workplaces, whereas people who work on short-term contracts or who are poorly educated or unemployed often do not receive help in maintaining their work ability (Järvikoski et al. 2002).

This chapter presents the differences in perceived work ability between socio-demographic groups. The object is to provide a general description of how work ability varies according to such factors as age, gender, region, education, employment status, occupation, and marital status. The association between these factors and work ability is discussed in more detail in later chapters.

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4.1 Age and gender

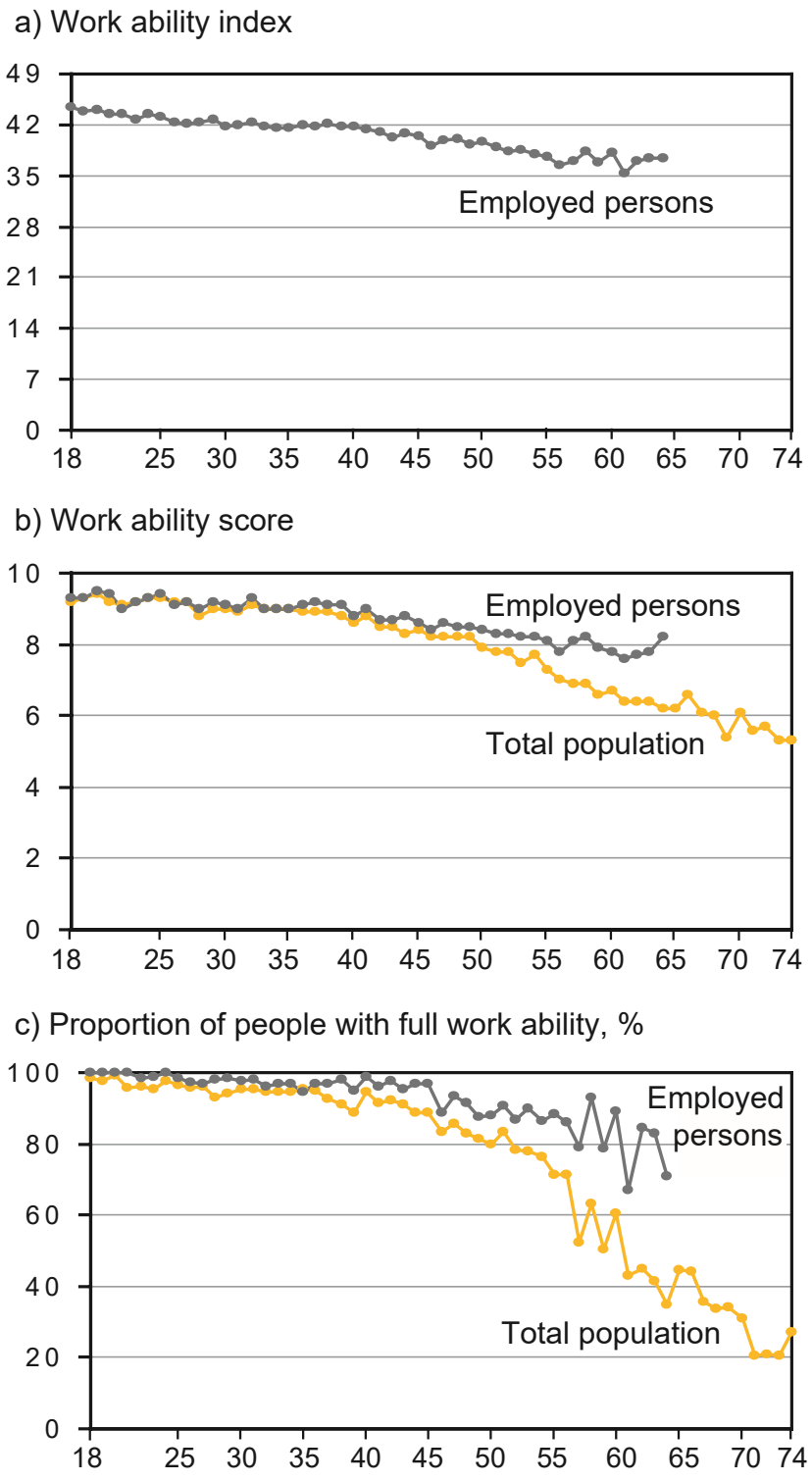
There are no major differences in the participation of men and women in worklife in Finland. In addition, earlier studies indicate that men and women perceive their work ability to be approximately the same (e.g., Ilmarinen et al. 1997; Perkiö-Mäkelä et al. 2006). The variation of work ability by age is clearly wider. Younger people perceive their work ability to be much better than older persons do (e.g., Ilmarinen et al. 1997; Ilmarinen and Tuomi 2004; Goedhard and Goedhard 2005).

Also in this study, work ability was the best among younger persons, and it decreased with growing age. The means of the work ability index and the work ability score were 90 per cent of the maximum scores in the youngest age groups. These means decreased slowly with age among those employed but more steeply among the entire population (Figure 4.1a and b). The proportion of people with full work ability according to the three-level work ability estimate decreased the most rapidly in the older age groups (Figure 4.1c). The difference between the work ability of the employed population and the entire population was great, especially after the 55th year of age. Those with better work ability had continued to work.

Among all 30- to 64-year-olds, 19 per cent of women and 20 per cent of men reported limited work ability. This difference was not statistically significant. There was, however, a statistically significant difference in the work ability scores of women (mean 8.2) and men (mean 8.0).

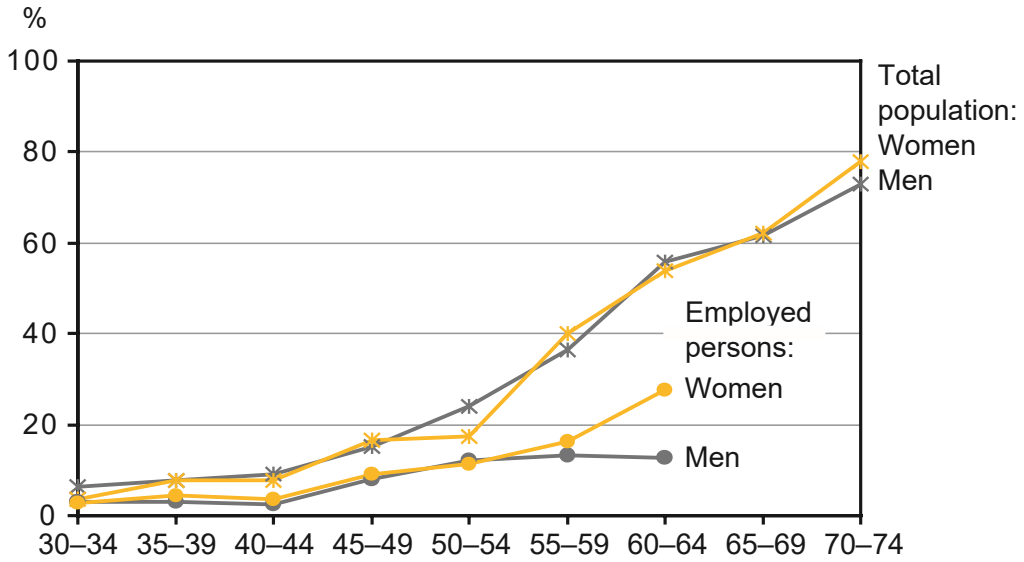
Among employed 30- to 64-year-olds, 8 per cent of women and 7 per cent of men reported having limited work ability. There was a corresponding statistically significant difference in the means of the work ability index between women and men, the mean for women being 39.8 and that for men being 40.4. Women's work ability index was decreased by their greater number of diseases and sickness absences, as well as by their insufficient mental resources, in comparison with men. On the other hand, the first item of the work ability index, the work ability score, was slightly better for women than for men. The mean of the work ability score was 8.7 for employed women and 8.6 for employed men.

Figure 4.1. *Means of the work ability index and work ability score and the proportion (%) of people with full work ability according to age.*



In the different age groups, there were no great differences in work ability between women and men. Yet, an exception to this trend was the oldest age group (60–64 years of age) among those employed. The work ability of employed men remained similar in the age groups of 50–54 years, 55–59 years, and 60–64 years, whereas the work ability of employed women was the poorest in the oldest age group. As many as 28 per cent of employed women aged 60 to 64 estimated that their work ability was limited, the respective proportion for men being only 13 per cent (Figure 4.2). The same difference could be seen for the work ability index, but not for the work ability score.

Figure 4.2. *Proportion (%) of those with limited work ability according to age and gender.*



Discussion

The results of this study confirmed those of earlier research in that age was related to a deterioration in work ability. The perceived work ability of older age groups both in worklife and in the entire study population was poorer than that of younger persons.

Two observations can be noted regarding the differences between the work ability of men and women. First of all, different indicators of work ability gave a slightly differing image of the work ability of the two genders. According to the work ability index, the work ability of women was poorer than that of men, but, according to the work ability score, it was better. This finding does not,

however, raise a question about coherence between the indicators, nor does it suggest inconsistent evaluations. Instead, it reflects the different content of the indicators. The work ability score measures current work ability compared with the lifetime best, and thus it does not depend solely on the current level of work ability. Instead, it takes into consideration previous abilities as well. The fact that employed women gave themselves better work ability scores (i.e., closer to their maximum level) than men did, and that their work ability index was poorer than men's, indicates that women also perceived their lifetime best work ability as being poorer than men did.

The other difference between the genders is related to the work ability of the oldest employees. The work ability of employed men remained somewhat the same between 50 and 64 years of age, whereas the work ability of women decreased significantly between the same ages. Do women approaching retirement age evaluate their work ability on a tighter scale than men do or have men with work ability problems moved into disability retirement or otherwise outside worklife more often than women? These questions are analysed more closely in Chapter 9.

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4.2 Region

Regional differences in work ability may reflect variations in industrial structures or in service systems that maintain work ability, such as health care services, rehabilitation, and the promotion of occupational well-being. Regional differences can also reflect the health disparities between areas, or they can be related to cultural differences.

In the analysis of the regional differences in work ability, the municipalities were divided into six groups based on their geographic location (western Finland, eastern and northern Finland, and southern Finland) and whether they were urban or non-urban[1] (Statistics Finland 2001). The largest group (almost 30 per cent of the 30- to 64-year-olds who participated in the Health 2000 Survey) consisted of the urban municipalities in southern Finland, whereas the smallest group was formed by non-urban municipalities in southern Finland (slightly over 5 per cent of the population).

Among the 30- to 64-year-old female population, those who lived in urban municipalities in southern Finland perceived their work ability to be the best, whereas among men those who lived in southern Finland, regardless of the type of municipality, had the best work ability (Table 4.1). The differences between the other regions were small, albeit men in eastern and northern non-urban municipalities had poorer work ability than those in other regions. There were no significant regional differences in the perceived work ability of employed women, but men living in non-urban municipalities in western, eastern, and northern Finland perceived their work ability to be poorer more often than men in other regions did.

Discussion

The regional variations in work ability were similar to the differences in several indicators of health and functional capacity. For a long time, the most significant regional difference in mortality in Finland has been between eastern and

1 The class ’non-urban’ includes here the classes ’semi-urban’ and ’rural’ of the statistical grouping of municipalities of Statistics Finland.

Table 4.1. *Age-adjusted[1] mean work ability score and the proportion (%) of those with limited work ability among 30- to 64-year-olds, according to region.*

Region	Work ability score		Persons with limited work ability				Distribution of population by region (%)
			Proportion (%)		OR[2]		
	All	Employed persons	All	Employed persons	All	Employed persons	All
Women							
Southern Finland							
Urban municipalities	8.4	8.8	15	8	1.0	1.0	29
Non-urban municipalities	7.8**	8.7	22	7	1.8***	1.0	5
Western Finland							
Urban municipalities	8.2*	8.7	21	10	1.6**	1.4	23
Non-urban municipalities	8.0***	8.6**	20	8	1.5*	1.1	13
Eastern and northern Finland							
Urban municipalities	8.1**	8.6*	21	7	1.6**	0.9	12
Non-urban municipalities	8.1*	8.7	21	7	1.7**	0.9	17
Total	8.2	8.7	19	8			100
Men							
Southern Finland							
Urban municipalities	8.1	8.7	17	6	1.0	1.0	28
Non-urban municipalities	8.1	8.6	16	6	0.9	1.1	6
Western Finland							
Urban municipalities	7.9	8.6	21	5	1.3	0.8	21
Non-urban municipalities	7.8*	8.4***	21	9	1.3	1.7*	14
Eastern and northern Finland							
Urban municipalities	8.0	8.6	22	6	1.4	1.1	12
Non-urban municipalities	7.7**	8.4*	25	9	1.7***	1.7*	19
Total	8.0	8.6	20	7			100

[1] Age-adjustment was based on a model including gender and age as explanatory variables and the figures for women and men are therefore comparable. There were 2,693 women and 2,487 men in the analysis of all 30- to 64-year-olds and 1,855 women and 1,841 men in the analysis of those employed.

[2] The odds ratio (OR) depicts the prevalence of limited work ability in other regions of Finland in comparison with the corresponding prevalence in the urban municipalities of southern Finland. Statistical significance of the difference: *p<0.05, **p<0.01, ***p<0.001.

western Finland. Other types of regional mortality differences have arisen recently, however, such as the decreased relative status of the metropolitan area of Helsinki (Pitkänen et al. 2000). The regional variations according to other indicators of health are not as clear. According to the baseline results of the Health 2000 Survey, southern Finland had better results with respect to several indicators of health, whereas some features of health behaviour formed exceptions (e.g., alcohol consumption and women's smoking). In eastern Finland, on

the other hand, many health problems were particularly frequent (Martelin et al. 2004). The better-than-average work ability of southern Finns and the poorer-than-average work ability of eastern and northern Finns in our study probably reflect this variation in health between the regions

In addition to health disparities, regional differences in work ability may also be related to differences in occupational structures and industrial branches. Work that involves heavy physical labour is more typical in eastern and northern Finland. This difference may help explain why limited work ability was the most common among men living in eastern and northern rural Finland.

Regional differences in the work ability of women were apparent only for the entire working-age population. There were no regional variations among employed women. This finding may be related to the regional differences in the proportion of disability pensioners. For example, the proportion of disability pensioners among the working-age population in some areas of northern Finland (Pohjois-Savo, Kainuu) is nearly double that of the larger metropolitan area (Uusimaa) in southern Finland (Finnish Centre for Pensions and The Social Insurance Institution 2007b).

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4.3 Education

Education is a vital determinant of social status. It has a significant role in defining careers and thus also the amount of income. It guides occupational choices, which then influence the prerequisites for work ability. Moreover, in addition to its contribution to material resources, education is a helpful means with which to search for and acquire information that would benefit the maintenance of health and work ability.

The education-related differences in work ability may be generated by education itself, but they may also be associated with how people are selected into a certain educational programme. Health and functional capacity can affect a person's choice of education and its length (Koivusilta 2000), and, if work ability deteriorates, a person's chances and motivation to participate in adult education programmes is affected.

Level of education was classified on the basis of basic and vocational education into the following five groups: 1) higher academic education, 2) higher vocational education, 3) secondary education, 4) upper basic education, and 5) lower basic education. In later chapters these five levels have been combined to three or four classes.

Nearly 40 per cent of all 30- to 64-year-old women and more than one fourth of men had either a higher vocational or academic degree. On the other hand, a secondary education was more common among men than among women. Approximately 30 per cent of both men and women had a lower basic education.

There were clear differences in perceived work ability between the different educational groups. Among men, the proportion of those with limited work ability in the group with a lower basic education was nearly fourfold that in the group with an academic education. The respective proportion for women was fivefold (Table 4.2). For the educational groups, differences in work ability were found in all of the 30- to 64-year age groups, and also among those 65 years of age and older.

Table 4.2. *Age-adjusted[1] mean work ability score and the proportion (%) of those with limited work ability among 30- to 64-year-olds, according to the level of education.*

Educational level	Work ability score		Persons with limited work ability				Distribution of population by educational level (%)
			Proportion (%)		OR[2]		
	All	Employed persons	All	Employed persons	All	Employed persons	All
Women							
Academic	8.6	8.9	7	3	1.0	1.0	*13*
Vocational	8.4**	8.8	13	5	2.1**	1.6	*26*
Secondary	8.2***	8.6*	20	11	3.9***	3.6***	*31*
Upper basic	8.0***	8.6*	20	8	4.0***	2.7**	*19*
Lower basic	7.3***	8.2***	35	16	9.5***	6.0***	*11*
Total	8.2	8.7	19	8			*100*
Men							
Academic	8.7	8.9	8	4	1.0	1.0	*11*
Vocational	8.3**	8.8	13	3	1.7	0.7	*15*
Secondary	8.0***	8.5***	18	6	2.7***	1.5	*41*
Upper basic	7.6***	8.5***	25	9	4.4***	2.4*	*18*
Lower basic	7.1***	8.2***	31	13	5.9***	3.5**	*15*
Total	8.0	8.6	20	7			*100*

[1] Age-adjustment was based on a model including gender and age as explanatory variables and the figures for women and men are therefore comparable. There were 2,692 women and 2,486 men in the analysis of all 30- to 64-year-olds and 1,855 women and 1,840 men in the analysis of those employed.
[2] The odds ratio (OR) depicts the prevalence of limited work ability in the other educational levels in comparison with the corresponding prevalence of those with the highest level of education (academic). Statistical significance of the difference: *p<0.05, **p<0.01, ***p<0.001.

Discussion

Previous research has proved that education is consistently related to most of the indicators of health and functional capacity (e.g., Martelin et al. 2004 and 2006). The measures used in this study also showed that the level of work ability increased as the level of education increased. According to a study by the OECD (2003) on work ability policies, educational level was one of the socio-economic factors that most clearly differentiated the occupationally disabled persons in the working population.

Education increases the possibilities to maintain work ability. It decreases the risk of physical workload at work and increases workers' control over their work. Education also offers a means with which to nurture work ability and overcome

problems of functional capacity that threaten work ability. The professional skills produced by education have, therefore, a significant role in a person's ability to work. Occupational resources can support control over one's work, coping with work, and work motivation.

Education-related differences in work ability are associated with both the significance of professional expertise that education brings and the related socioeconomic status. Those with a higher education are often better off also according to economic, occupational, social, and health measures. The differences in perceived work ability according to educational level should thus be interpreted from the viewpoint of the socioeconomic status that education reflects.

The association between professional expertise and perceived work ability has been examined more carefully in Section 5.3, and the significance of education is re-examined in Chapter 10, in which changes in work ability during the last few decades have been analysed. A more detailed assessment of the education-related differences in work ability has been left for future research, however.

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4.4 Employment status

Employment status reflects a person's economic activity. The main classification of employment status is to divide the population into the workforce (i.e., those employed and those unemployed) and those who are outside the workforce. The workforce can be further divided into those employed full-time and those employed part-time.

This section presents a general description of the differences between the perceived work ability of the working population and that of the groups outside worklife. A comparison of these groups provides valuable knowledge for the maintainance of work ability.

The information on employment status was derived from the questions of the home interview. In the age group 30 to 64 years, most women (69 per cent) and men (74 per cent) had full-time or part-time jobs. About one tenth of the participants were unemployed or had been temporarily laid off. A pension was collected by 14 per cent of women and 15 per cent of men. The primary reason for having been granted a pension in this age group was disability. Approximately 5 per cent of women took care of their household or a family member, while the respective proportion of men was only 3 out of 1,000.

The proportion of both men and women who reported having limited work ability was the smallest among full-time employees (Table 4.3). The second smallest group in this respect was part-time employees; yet the difference between those working part-time and those working full-time was clear in that the proportion was twofold for part-time workers. Both the work ability score and the work ability index also indicated that the work ability of part-time employees was poorer than that of full-time workers. The difference remained the same even after adjustment for education and occupation.

People outside worklife experienced much more disability than those employed. An exception was the group of women who took care of their households or a family member. Their work ability was similar to that of the part-time workers. About 30 per cent of the unemployed or those with an unemployment pension reported limited work ability, while the respective figure for people with full-time

work was less than 8 per cent. Perceived limited work ability was naturally very common among those on a disability pension, although 16 per cent of women and 10 per cent of men in this group reported being fully able to work.

Table 4.3. *Age-adjusted[1] mean work ability score and the proportion (%) of those with limited work ability among 30- to 64-year-olds, according to employment status.*

Employment status	Work ability score	Persons with limited work ability		*Distribution of population by employment status (%)*
		Proportion (%)	OR[2]	
Women				
Full-time employed	8.6	8	1.0	*61*
Part-time employed	8.3**	18	2.6***	*8*
Unemployed or temporarily laid off	7.8***	27	4.7***	*10*
Unemployment pensioner	7.6***	33	6.2***	*2*
Disability pensioner	5.0***	84	80.8***	*8*
Other pensioner	7.5***	26	4.4***	*4*
Person caring for household or family member	8.1***	18	2.6**	*5*
Other	8.3	26	4.3***	*2*
Total	8.2	19		*100*
Men				
Full-time employed	8.5	7	1.0	*71*
Part-time employed	8.0**	19	3.2***	*3*
Unemployed or temporarily laid off	7.2***	32	6.6***	*9*
Unemployment pensioner	7.7***	28	5.4***	*2*
Disability pensioner	4.5***	90	154.1***	*10*
Other pensioner	7.3***	27	5.1***	*3*
Person caring for household or family member	(6.7)	(73)	(44.7)***	*0*
Other	7.1***	37	8.6***	*2*
Total	8.0	20		*100*

[1] Age-adjustment was based on a model including gender and age as explanatory variables and the figures for women and men are therefore comparable. There were 2,692 women and 2,486 men in the analysis.
[2] The odds ratio (OR) depicts the prevalence of limited work ability in other groups of the labour market in comparison with the corresponding prevalence of those employed full-time. Statistical significance of the difference: *p<0.05, **p<0.01, ***p<0.001.
( ) Size of the study population at risk 6–19.

Discussion

Those who were outside worklife reported, on average, that their work ability was poorer than that of employed persons. Disability pensioners, in particular, considered their work ability to be limited, but some of them reported being able to work. This result is partially explained by the fact that some of the respondents referred to a disability pension even though they had been granted a pension for some other reason. Another plausible explanation has to do with the diagnoses in that mental handicap was the most common reason for a disability pension among those who believed that they were able to work. The poor work ability of the unemployed is consistent with earlier observations indicating that this group has a greater mortality rate than the employed population (e.g., Martikainen and Valkonen 1996) and more problems with health and work ability (Lahelma 1989; Koskinen et al. 2004). The work ability of the unemployed has also been addressed in Chapter 7.

People who cared for their household or family members reported that their work ability was poorer than did those who had full-time employment. This result may be an indicator of how exhausting such work is, or it may indicate selection in that people with limited work ability may have chosen this role more often than those who believed that they were fully able to work. This possibility may also refer to part-time workers. Their work ability was poorer than that of full-time workers according every measure of work ability. The group of part-time employees also included those on a part-time pension, whose work ability and health have been shown to be poorer than those of full-time workers (Takala 2004).

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4.5 Occupation

Variation in work ability in different occupations is related to both work and workers' resources. Occupations vary according to, for example, the contents of work, its demands, and work conditions, and the characteristics of workers differ in various occupations.

Occupation was based on a question presented in the home interview. People who were not working at the time of the interview were asked to list their latest occupation. The occupations were classified according to the Classification of Occupations by Statistics Finland (1997). In this chapter we mainly used the following nine occupational groups:

- *Managers and senior officials*
- *Teachers*
- *Other professionals*, e.g., physicians, nurses, business professionals, technicians, researchers, and artists
- *Office and customer service clerks*, e.g., secretaries, bank clerks, mail carriers, and sorting clerks
- *Service, sales, and care workers*, e.g., sales persons, hair dressers, hospital ward assistants, cooks, waiters and waitresses, and guards
- *Craft and related trades workers*, e.g., tailors, sewers, carpenters, construction workers, and machinery mechanics
- *Plant operators and drivers*, e.g., electronic-equipment assemblers, paper-pulp plant operators, and drivers
- *Workers in elementary occupations*, e.g., cleaners, kitchen helpers, packers, and freight handlers
- *Agricultural and forestry workers.*

Professionals comprised the largest occupational group among both men and women in this study. Service and sales personnel made up the second largest group among women, whereas, among men, craft and related trades workers formed the second largest group.

Perceived work ability in the occupational groups

Table 4.4 depicts the differences in work ability between occupational groups in the entire study population and among those employed. Among the non-employed the occupation refers to the last occupation.

Among both men and women, managers, professionals, and office clerks perceived their work ability to be better than did those in other occupational groups. Proportionally, most of the workers with limited work ability were found among agricultural and forestry workers, plant operators, and other blue-collar workers, such as cleaners and freight handlers. Men in service and sales work also rated their work ability as poor (Table 4.4).

The differences in work ability between occupations were, for the most part, similar both among the employed and among all 30- to 64-year-olds. There were, however, some exceptions. For example, among employed craft and related trades workers, the estimate of work ability did not differ significantly from that of managers and officials. On the other hand, for the entire population aged 30 to 64, once those who had left worklife were included, the proportion of people with limited work ability among craft workers was much greater than among white-collar workers. A similar difference was also found for male clerks. The work ability of those employed in this occupational group was good, but, when all the men classified as belonging to this group were included, the work ability estimate was clearly poorer than that of other white-collar professions (Table 4.4).

Table 4.5 presents the mean scores of the work ability index according to a more gender-specific classification of occupations. Professional occupations typical for women, such as teachers, nurses, practical nurses, physicians, and other health care personnel, were divided into separate groups. Practical nurses' work ability index was significantly lower than that of managers and senior officials, who were used as the reference group. The work ability index of male physicians and other health care personnel was the highest of the occupational groups presented here. The work ability of female service and sales workers was the poorest in the restaurant sector (i.e., chefs, cooks, and waitresses).

Agricultural and forestry workers had the lowest work ability index. Poor work ability was particularly pronounced for women, although it was evident for both genders. Only 14 per cent of women in agricultural occupations had a rating of excellent for their work ability (44–49 points), whereas for men this percentage was 29 per cent.

Table 4.4. *Age-adjusted[1] mean work ability score and the proportion (%) of those with limited work ability among 30- to 64-year-olds, according to occupation.*

Occupation	Work ability score		Persons with limited work ability				*Distribution of population by occupation (%) Employed persons*
			Proportion (%)		OR[1]		
	All	Employed persons	All	Employed persons	All	Employed persons	
Women							
Managers and senior officials	8.3	8.8	14	6	1.0	1.0	*7*
Teachers	8.5	8.8	9	3	0.5	0.5	*8*
Other professionals	8.4	8.7	14	7	1.0	1.2	*37*
Office and customer service clerks	8.5	8.9	12	5	0.8	0.9	*14*
Service, sales and care workers	8.0	8.7	21	8	1.7*	1.4	*16*
Craft and related trades workers	7.5*	8.6	32	11	3.4***	1.9	*3*
Plant operators and drivers	7.9	8.5	30	15	3.1**	2.9	*4*
Workers in elementary occupations	7.6***	8.3***	28	15	2.6***	2.9**	*8*
Agricultural and forestry workers	7.6**	8.1**	33	17	3.7***	3.4**	*4*
Total	8.2	8.7	19	8			*100*
Men							
Managers and senior officials	8.4	8.8	12	5	1.0	1.0	*18*
Teachers	8.5	8.6	10	5	0.8	1.0	*3*
Other professionals	8.4	8.8	13	4	1.1	0.8	*27*
Office and customer service clerks	8.0	8.9	26	6	3.1*	1.3	*2*
Service, sales and care workers	7.8**	8.5	28	15	3.3***	3.5**	*3*
Craft and related trades workers	7.6***	8.4***	25	7	2.8***	1.4	*23*
Plant operators and drivers	7.7***	8.4***	23	10	2.5***	2.2*	*12*
Workers in elementary occupations	7.6***	8.5	25	10	2.8***	2.3	*5*
Agricultural and forestry workers	7.4***	8.1***	29	14	3.7***	3.1**	*7*
Total	8.0	8.6	20	7			*100*

[1] Age-adjustment was based on a model including gender and age as explanatory variables and the figures for women and men are therefore comparable. There were 2,673 women and 2,463 men in the analysis of all 30- to 64-year-olds and 1,853 women and 1,839 men in the analysis of those employed.

[2] The odds ratio (OR) depicts the prevalence of limited work ability in other occupational groups in comparison with the corresponding prevalence of managers and high officials. Statistical significance of the difference: *p<0.05, **p<0.01, ***p<0.001.

Table 4.5. *Age-adjusted[1] mean of the work ability index for employed 30- to 64-year-olds, according to occupation.[2]*

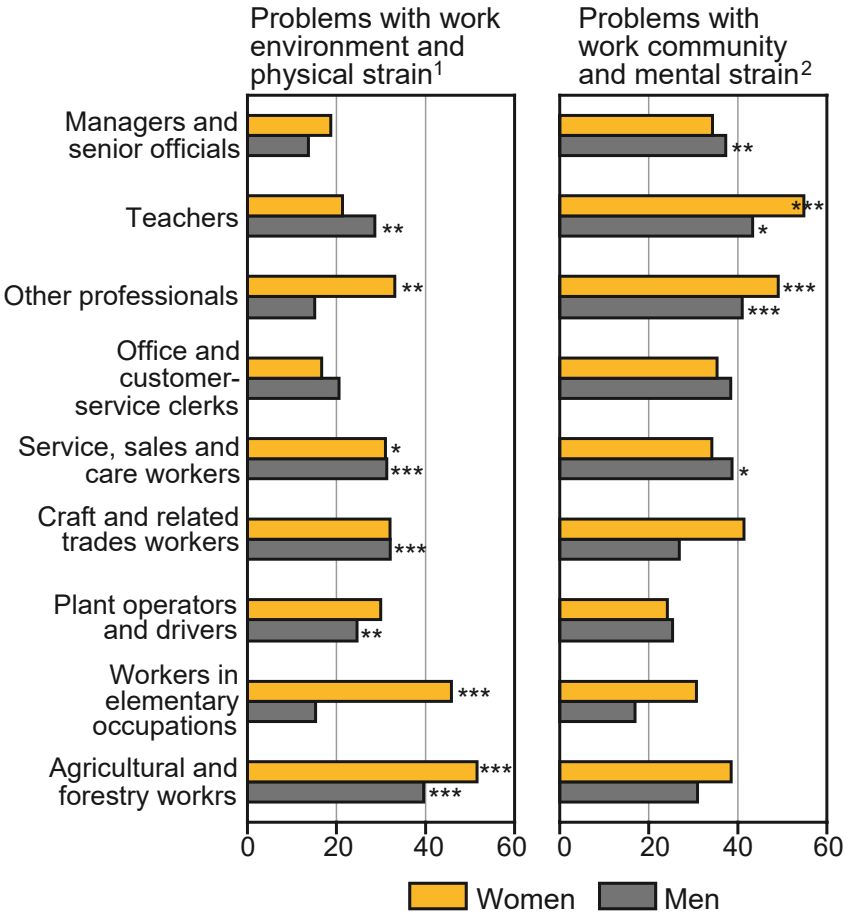
Occupation	Women	Men
Managers and senior officials	40.3	41.9
Professionals		
Teachers	40.4	41.0
Nurses	40.6	
Practical nurses	38.7*	
Physicians and other health care experts	40.4	42.4
Other professionals	40.2	41.9
Office and customer service clerks	40.6	41.3
Service and sales workers		39.6***
Chefs, cooks, waiters and waitresses	38.5*	
Sales persons	40.4	
Other service and care workers	39.5	
Craft workers	38.2*	
Construction workers		39.1***
Repairmen		40.9***
Manufacturers		39.5*
Plant operators and drivers	37.9***	
Process personnel		39.4***
Drivers		39.1***
Workers in elementary occupations	37.5***	39.9**
Agricultural and forestry workers	37.1***	38.7***

[1] Age-adjustment was made for men and women separately.
[2] Altogether 1,771 women and 1,722 men were included in the analysis. Statistical significance of the difference between the other occupational groups in comparison with managers and high officials: *p<0.05, **p<0.01, ***p<0.001.

Perceived problems that hindered work

Problems concerning the work environment and physical workload were common among agricultural workers and other employees in blue-collar jobs. Male workers in elementary occupations were an exception to the rule. They experienced clearly fewer physical problems than other workers. On the other hand, female professionals experienced as many physical problems that hindered their work as their counterparts in industrial work did. Most of these female professionals worked in the health care sector in physically demanding jobs. Male teachers also reported problems concerning their work environment and physical strain (Figure 4.3).

Figure 4.3. *Age-adjusted proportion (%) of employed 30- to 64-year-olds who experienced problems concerning physical or mental strain in their work.*



[1] "Managers and senior officials" as the reference group.
[2] "Plant operators and drivers" as the reference group.
Statistical significance of the differences between the occupational groups: *p<0.05, **p<0.01, ***p<0.001.

Problems concerning the work community and mental strain were common in all occupational groups. Male workers in elementary occupations were the only group among which fewer than 20 per cent perceived these problems. As expected, these issues were most common in white-collar occupations, especially among female professionals (Figure 4.3).

Discussion

There were clear differences in work ability between the occupational groups. As in earlier studies (e.g., Ilmarinen et al. 1997; Nielsen 2001; Perkiö-Mäkelä 2006),

people with white-collar jobs and those in physically less demanding sectors gave their work ability a higher rating than those in other occupations did.

The problems at work that were related to physical load did not occur only in blue-collar occupations. There were some white-collar occupations as well in which problems due to the work environment or physical load were common. On the other hand, mental problems at work did not occur only in white-collar professions. Over one third of blue-collar workers perceived mental strain that hindered their ability to cope at work.

The examination of issues hindering work showed that problems with the work community and mental strain were not as clearly reflected in work ability estimates as health issues and physical strain were. Especially teachers and other professionals reported problems with the work community and mental strain, even though their perceived work ability was good. It is evident thus that, although problems with the work community hinder a person's ability to cope at work, they are interpreted as external problems, and thus they do not necessarily affect subjective work ability estimates. This is an important observation to take into consideration when actions are planned to promote and maintain work ability.

In some occupational groups those employed considered their work ability to be good, but, when the study was expanded to include those who had left worklife, the work ability estimations were significantly poorer. Occupational groups that showed selection of those with limited work ability out of worklife included craft and related trades workers and, among men, customer service clerks. The differences in work ability can thus be explained, not only by selection into occupations, the health effects of occupations, or the demands that certain occupations set for functional capacity, but also by how readily workers seek to relinquish their jobs when their work ability deteriorates.

One of the most distinctive results in the examination of occupational groups was that farmers had poorer work ability than people in other occupations. Similar results have been reported also in other studies (e.g., Nielsen 2001; Peltoniemi 2005; Perkiö-Mäkelä 2006). In farming, especially the physical load of the work was a key issue, and the problems were the most consistent among women. Apparently farming is also an occupation in which people continue to work long after their work ability has begun to deteriorate. This phenomenon may be related to shortcomings in occupational health care among agricultural entrepreneurs, but it may also be related to the nature of farming as a way of life.

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4.6 Marital status

Work ability may be related to family conditions in many ways. One possible factor that can affect work ability is social support. Family is generally regarded as a primary source of social support. Marital status can therefore be considered a rough indicator of a person's access to primary social support. The possibilities for single or divorced persons and widows or widowers to receive social support are not as great as for married persons who can get support from a spouse. The work ability of widows and widowers and divorced people can also vary according to how long it has been since they lost their partner. Recent bereavement or marital disruption may inflict stress that temporarily affects work ability (Heikkinen et al. 2005).

According to the interviews, 74 per cent of 30- to 64-year-old men and women were married or cohabitated, and 11–15 per cent were single. About 10 per cent were divorced and 1–3 per cent were widowed (Table 4.6).

Married people and those cohabitating perceived their work ability to be better than did those with other marital statuses. Widows clearly had more problems with their work ability than married women, whereas the work ability of divorced or single women did not differ significantly from that of married women. Among men, however, single and divorced men gave the lowest ratings for their work ability, and the work ability of widowers was close to that of married men. The work ability of men who had been divorced for over 2 years was poorer than that of those who had been divorced for a shorter period of time (Table 4.6).

A closer examination of family structure added a few facts to the topic. The proportion of adults with limited work ability was smallest in the households consisting of a couple and children under 18 years of age. The work ability of people living alone was poorer than that of those living with another adult, albeit the difference between women living alone and those with a spouse was smaller than the respective difference among men. The largest number of persons with limited work ability belonged to the group of "others", which consisted of people living in institutions and adults living with their parents, among others (Figure 4.4).

Table 4.6. *Age-adjusted mean work ability score and the proportion of those with limited work ability among 30- to 64-year-olds, according to marital status.*[1]

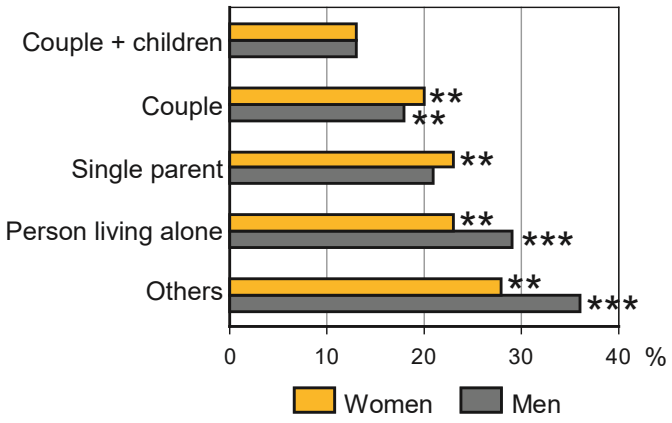
Marital status	Work ability score	Persons with limited work ability		Distribution of population by marital status (%)
		Proportion (%)	OR[2]	
Women				
Married	8.4	16	1.0	*61*
Cohabitating	8.2	18	1.2	*13*
Divorced	8.2	18	1.2	*12*
<2 years	8.2	15	1.0	
>2 years	8.1	18	1.3	
Widowed	7.5	29	2.5***	*3*
<2 years	8.1	36	3.8**	
>2 years	7.4	27	2.3**	
Single	8.1	20	1.4	*11*
Total	8.2	19		*100*
Men				
Married	8.2	15	1.0	*60*
Cohabitating	8.3	16	1.1	*14*
Divorced	7.3	26	2.3***	*9*
<2 years	7.8	20	1.5	
>2 years	7.2	28	2.6***	
Widowed	8.0	17	1.2	*1*
<2 years	7.2	22	1.7	
>2 years	8.4	15	1.0	
Single	7.7	30	3.1***	*15*
Total	8.0	20		*100*

[1] There were 2,700 women and 2,491 men in the analysis.
[2] The odds ratio (OR) depicts the prevalence of limited work ability among those with other marital statuses compared to the corresponding prevalence of married people. Statistical significance of the difference: *p<0.05, **p<0.01, ***p<0.001.

Discussion

Three issues arise from this material that demand a closer examination. Firstly, it was exceptionally common for single and divorced men to have problems with work ability. The second observation was related to widowed women. Their work ability problems seemed to continue for long periods after the death of their spouse. Thirdly, people who lived in a nuclear family (i.e., a unit consisting of both adults and children) possessed a better work ability than other people.

Figure 4.4. *Age-adjusted proportion (%) of those with limited work ability among 30- to 64-year-olds, according to family structure.*



[1] Statistical significance of the difference between other marital statuses and couple + children: *p<0.05, **p<0.01, ***p<0.001. There were 2,710 women and 2,508 men in the analysis.

In this study population, work ability was poor especially among women who had recently lost their spouse through death. The work ability of widows was still poor after 2 years of being widowed. On the other hand, full work ability was equally common among men who had been widowers for at least 2 years and among married men. Another point of interest was that divorce was not a key issue in the deterioration of work ability among women, whereas the proportion of limited work ability among men who had been divorced for more than 2 years was high, nearly as high as among single men.

The observed association between family status and work ability among both women and men may be related to the social resources provided by a family and living habits associated with family life. The presence of children in the family increased the probability of good work ability among couples. Children in a family may be a source of motivation in connection with work ability, but, on the other hand, good work ability may have influenced the decision to start a family.

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4.7 Summary and conclusions

The preceding sections of this chapter examined the differences in work ability according to age, gender, region, education, employment status, occupation, and marital status. Differences in perceived work ability were found among all of these groups.

- Perceived work ability deteriorated as people moved from the younger age groups to the older groups. The poor work ability of employed women aged 60 to 64 was especially evident.
- Among women the average work ability was best in urban municipalities in southern Finland. Among men the best average work ability was observed in southern Finland as a whole (covering both the urban and non-urban areas).
- Well-educated persons rated their work ability better than did those with less education.
- Problems with work ability were more common among single and divorced men and widowed women than among those with other marital statuses. Couples with children perceived their work ability to be the best.
- Men and women with full-time employment rated their work ability to be better than did those with part-time jobs or the unemployed and others who were outside worklife.
- Physicians, teachers, and other white-collar workers rated their work ability to be better than did people in blue-collar jobs. Issues that hindered coping at work, such as problems within the work community or mental strain, were common, however, especially among teachers and other professionals.
- The work ability of agricultural entrepreneurs was poorer than that of the other occupational groups.

In the preceding sections of this chapter the differences in work ability among the population groups were portrayed separately for each population variable. However, there may be associations between these variables that can explain the differences in work ability. The regions differ in their educational and occupa-

tional structures, for example. People with different marital statuses have different educational backgrounds, and also occupations and educational levels are linked. To show the independent relations between the different population variables and work ability, we have included the population variables in the same model in the following section.

Four of the population variables previously examined separately were chosen for simultaneous analysis (education, occupation, region, and marital status). Employment status was not included as such because its strong association with work ability is partly technical; for example, being granted a disability pension is a consequence of work disability, not a risk factor for it.

Some classes of the variables that were used in the separate analyses had to be combined to make the size of the groups sufficient. The analyses were carried out separately for all 30- to 64-year-olds and for the employed population of the same age. Table 4.7 presents the results of logistic regression analysis of the age-adjusted association between each single population variable and limited work ability (Models A and D), as well as the significance of the variables when the other population variables have been adjusted for (Models B, C, E and F).

Table 4.7 shows that, firstly, the educational and occupational groups are clearly related. The association between both education and occupation with work ability decreased considerably when their association with work ability was examined simultaneously (Models B and E). Adding region and marital status to the model had little effect on the contribution of education and occupation (Models C and F). Even when all of the variables were adjusted, the association between work ability and education was clear, both for all 30- to 64-year-olds and for those employed.

When all 30- to 64-year-old men were included in the analyses, men in all other occupational groups were at greater risk of having limited work ability than the group of managers and professionals (Models A–C). On the other hand, among employed men, poor work ability in the occupational group of craft workers, plant operators and drivers was strongly related to poor education (Models D–F). After education was adjusted, the risk of limited work ability was not significantly greater among the aforementioned occupations than among managers and professionals. Agricultural and industrial workers had the poorest work ability among both the employed women and the women in the entire study population (Models A–F).

Table 4.7. *Association of education, occupation, region, and marital status with limited work ability among 30- to 64-year-olds. Odds ratios of logistic regression models*[1].

	All			Employed persons		
	Model A (age-adjusted)	Model B (A + education and occupation)	Model C (B + region and marital status)	Model D (age-adjusted)	Model E (D + education and occupation)	Model F (E + region and marital status)
WOMEN						
Education						
High	1.0	1.0	1.0	1.0	1.0	1.0
Secondary	2.3***	1.8**	1.8**	2.6***	2.2**	2.2**
Basic	3.3***	1.9***	1.9**	2.5***	1.9*	1.8*
Occupational group						
Managers and professionals	1.0	1.0	1.0	1.0	1.0	1.0
Office and other clerks	0.9	0.7	0.7	0.8	0.7	0.7
Service, sales and care work	2.0***	1.5	1.4	1.3	1.0	1.0
Craft and plant work, drivers elementary occupations	3.2***	2.3***	2.3***	2.7***	2.0*	2.0**
Agricultural and forestry work	4.1***	3.2***	3.0***	3.3***	2.5**	2.5*
Region						
Southern Finland	1.0		1.0	1.0		1.0
Western Finland	1.4**		1.2	1.3		1.1
Eastern and northern Finland	1.5**		1.3	0.9		0.8
Marital status						
Married or cohabitating	1.0		1.0	1.0		1.0
Divorced or single	1.3		1.3	1.1		1.2
Widowed	2.3***		2.1***	2.6*		2.5*
MEN						
Education						
High	1.0	1.0	1.0	1.0	1.0	1.0
Secondary	2.0***	1.4	1.4	1.7	1.4	1.4
Basic	3.7***	2.0***	1.9**	3.4***	2.5**	2.4**
Occupational group						
Managers and professionals	1.0	1.0	1.0	1.0	1.0	1.0
Office and other clerks	3.0*	2.6*	2.4*	1.5	1.2	1.2
Service, sales and care work	3.2***	2.7**	2.6**	4.0**	3.1*	3.1*
Craft and plant work, drivers elementary occupations	2.6***	2.0***	1.8***	2.0**	1.4	1.3
Agricultural and forestry work	3.6***	2.7***	2.3**	3.5***	2.4*	2.3*
Region						
Southern Finland	1.0		1.0	1.0		1.0
Western Finland	1.3*		1.2	1.1		1.0
Eastern and northern Finland	1.6***		1.5**	1.4		1.2
Marital status						
Married or cohabitating	1.0		1.0	1.0		1.0
Divorced, single or widowed	2.7***		2.2***	1.1		1.5

[1] There were 2,672 women and 2,462 men in the analysis of all 30- to 64-year-olds and 1,853 women and 1,838 men in the analysis of those employed. Statistical significance of the difference: *p<0.05, **p<0.01, ***p<0.001.

The regional differences in work ability were clear for all 30- to 64-year-olds when the regional division was analysed separately without the other variables being included. The association decreased distinctly, however, when other variables – especially educational level and occupational group – were considered simultaneously. The risk of limited work ability was significantly greater among men in eastern and northern Finland than among those in southern Finland, even when the other variables had been adjusted for. In the employed population region was not related to perceived work ability. Including the urban–non-urban dimension into the regional division did not change the result.

The influence of marital status on limited work ability among men was examined in two categories, men living with a spouse and others. When women were examined, three categories were used because we wanted to keep widows as a separate group. Limited work ability was more common among the widowed, divorced, and single men than among those living with a spouse in the entire study population even when the other variables were adjusted for. Adjusting for the other variables did, however, decrease the relationship between marital status and work ability among men. Among women, the greater risk of limited work ability among widowers was evident also when education, occupation, and region were adjusted for (Table 4.7).

To summarise, among all 30- to 64-year-old men, limited work ability was the most common among those having a low level of education, belonging to an occupational group other than managers and professionals, and living in eastern or northern Finland or without a spouse. Among employed men, a low level of education and working in the service, sales or agricultural sector were the strongest predictors of limited work ability. On the other hand, a low level of education, working in the agricultural or industrial sector, and widowhood were the strongest factors for all 30- to 64-year-old women, as well as for those employed.

The differences in work ability between the population groups raise several important questions. Firstly, how can the deterioration of work ability be prevented among those not employed? How should work ability be promoted among people with a low level of education, whose jobs often include handling heavy loads? These groups are easily disregarded in activities promoting the ability to cope with work (Järvikoski et al. 2002). The results also emphasize the poorer work ability of agricultural workers in comparison with that of others. Is this situation related to the current problems in the agricultural sector? The insecurity and uncertainty

that have become a part of the profession, as well as European Union regulations and the growth of farm size, are examples of factors that may threaten the work ability of farmers (Peltoniemi 2005). Another interesting question concerns the association between part-time work and limited work ability. Have part-time workers been excluded from activities to maintain work ability, or are people with limited work ability selected into part-time work? And, finally, how should widowed women and single or divorced men without the social support of a spouse be helped to cope at work?

5 Factors Affecting Work Ability

Good work ability is a balance between a worker's resources, the demands and opportunities offered by work, and the characteristics of the external environment. All of these factors can be assumed to influence employees' estimations of their work ability. In this chapter, we investigate the ways in which self-evaluated work ability is associated with these factors. We examine individual resources by looking at health, diseases, functional capacity, expertise, and attitudes towards work. We also consider how the demands, opportunities, content and organization of work affect perceived work ability.

The aim of our review is to bring to the fore factors that, if influenced, could improve the population's work ability.

Self-assessment of work ability is based on the perceived performance at work and on internalized work norms. Poor perceived work ability can be related to deterioration in health, expertise or motivation, to the physical demands of work, to problems in the work community, to work organization factors, or to other problems involving the work process or the external environment. An evaluation of one's own work ability can thus take into consideration views on coping at work, work control, opportunities at work, and participation in the work community, all of which can be emphasized in different ways.

In this chapter, we delineate work ability using the work ability models that were presented in Section 2.2 by searching for factors related to subjective work ability estimates. The chapter is organized according to the structure of the work ability house, also presented in Section 2.2 (Figure 2.1). The first two sections describe the relation between perceived work ability and health and functional capacity, the first floor of the work ability house. Then we move to the higher floors of the house and describe the relation between perceived work ability and expertise and attitudes towards work, and also the demands, opportunities, contents, and organization of work. Chapter 6 then combines the dimensions presented separately in this chapter.

For the most part, we use three indicators of perceived work ability in this chapter, the work ability estimate, the work ability score, and the work ability

index. (See Section 3.2.) The work ability index is not, however, used as an indicator of work ability when the relationship between work ability and diseases is studied because the information on diseases that hinder work ability is an integral part of the work ability index. We also present selected results concerning subgroups defined according to the physical strenuousness of work.

Seppo Koskinen, Tuija Martelin, Päivi Sainio, Raija Gould

5.1 Health

Good health is essential for good work ability. In our study, the prevalence of limited work ability was sixfold among people who perceived their health to be average compared with those who perceived themselves to be in good health. Poor self-rated health did not, however, necessarily indicate poor work ability. Over one third of the people with poor self-rated health did not consider their work ability to be limited.

All common chronic diseases decrease work ability. Mental disorders, especially psychosis, and coronary heart disease had the strongest negative influence on work ability. Depression, back and neck problems, and hypertension had a smaller effect on work ability on the individual level, but, because they are so prevalent, they decreased the average work ability of the entire population the most. The work ability of those employed was affected the most by depression and back problems.

Deterioration in health may restrict functional capacity to the point that, depending on personal resources and work, work ability may decrease. Thus, the influence of a particular disease or injury on a person's ability to cope at work depends on the type of work, the work environment, the work organization, and also on his or her other resources.

Statistics on social protection provide detailed information on the significance of different diseases with respect to disability benefits. Mental disorders are the most important grounds for a disability pension being granted in Finland. Other important grounds are musculoskeletal disorders, cardiovascular diseases, and diseases of the nervous system, but their share is clearly smaller (Finnish Centre for Pensions and The Social Insurance Institution 2007a).

There is less information available on the effect of different diseases on perceived work ability. According to previous research, especially musculoskeletal disorders affect perceived ability to cope at work (Pohjonen 2001a and 2001b; Väänänen-Tomppo et al. 2004; Perkiö-Mäkelä 2006).

In this section, we examine the association of self-evaluated work ability with perceived health and some prevalent diseases. The information on morbidity is based on people's own report of their medically diagnosed diseases.

5.1.1 Perceived health and long-term morbidity

Among 30- to 64-year-olds, 6 per cent of women and 10 per cent of men rated their health as rather poor or poor. These men and women estimated their work ability, on average, to be no more than approximately one third of their lifetime best (work ability score 3.6 for women and 3.1 for men). In addition, about 90 per cent of these men and women perceived their work ability to be limited. Correspondingly, most of the persons who perceived their health to be good or rather good (approximately two thirds of the participants) considered themselves to be fully able to work (Table 5.1).

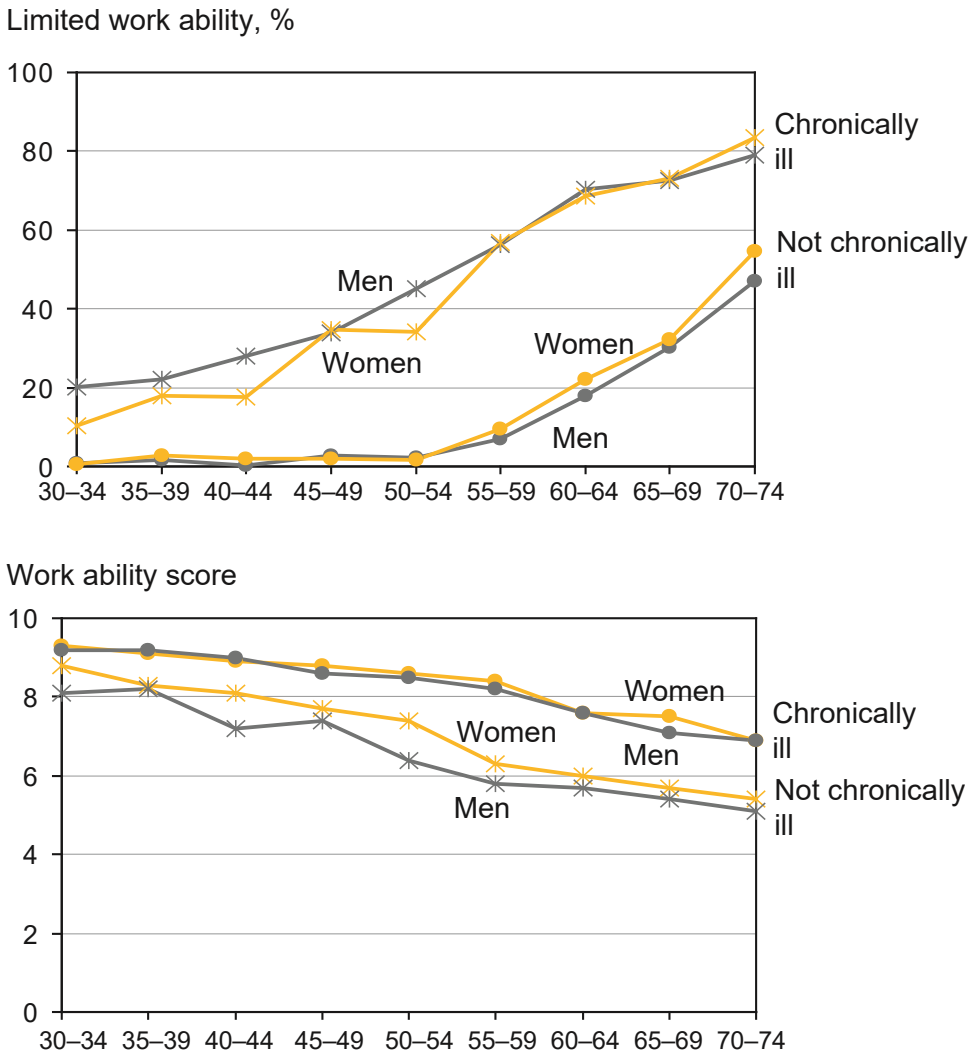
Table 5.1. *Age-adjusted[1] mean work ability score and the proportion (%) of those with limited work ability among 30- to 64-year-olds, according to self-rated health.*

Self-rated health	Work ability score	Persons with limited work ability		*Distribution of self-rated health (%)*
		Proportion (%)	OR[2]	
Women				
Good	8.9	4	1.0	*39*
Rather good	8.4***	12	3.2***	*32*
Average	7.4***	31	12.6***	*22*
Rather poor	5.2***	73	107.8***	*5*
Poor	3.6***	95	1033.5***	*1*
Total	8.2	19		*100*
Men				
Good	8.9	6	1.0	*37*
Rather good	8.4***	12	2.2***	*30*
Average	7.2***	27	7.0***	*24*
Rather poor	5.2***	64	47.7***	*7*
Poor	3.1***	87	224.4***	*3*
Total	8.0	20		*100*

[1] Age-adjustment was based on a model including gender and age as explanatory variables, and the figures for women and men are therefore comparable. The analysis included 2,692 women and 2,481 men.
[2] The odds ratio (OR) depicts the prevalence of limited work ability in other classes of self-rated health in comparison with the corresponding prevalence of those who reported being in good health. Statistical significance of the difference: *p<0.05, **p<0.01, ***p<0.001.

In the age group 30 to 44 years, over 80 per cent of the participants who considered themselves to have an average health status reported that they were fully able to work, whereas only 20 per cent of the 65- to 74-year-old participants having average self-rated health were fully able to work. The same trend was observed in all classes of self-rated health in that the proportion of those who reported being able to work decreased rapidly with age.

Figure 5.1. *Proportion (%) of those with limited work ability and the mean work ability score for those chronically ill and those with no chronic illnesses.*



Nearly every other 30- to 64-year-old reported having at least one chronic illness, defect, or injury. Among persons with a chronic illness only about one fifth of those under 45 years of age considered their work ability to be limited, whereas

among those aged 60 to 64 the corresponding proportion was two thirds (Figure 5.1). Hardly any of those under-55-year-olds who did not have a chronic illness evaluated their work ability as being limited, but among persons aged 55 or older, limited work ability became increasingly prevalent with age, even among those who considered themselves to be healthy. The work ability score provides a more fine-tuned picture of work ability even when no major limitations to work ability exist. The lower part of Figure 5.1 shows how the work ability score of persons with no chronic illnesses decreased with age also below the age of 55 years.

5.1.2 Cardiovascular diseases and diabetes

Among 30- to 64-year-olds, coronary heart disease was strongly associated with perceived work ability. Altogether 2 per cent of women and 4 per cent of men reported having had a myocardial infarction or some other form of coronary disease. Persons with coronary heart disease estimated their work ability to be on average less than 60 per cent of their lifetime best (work ability score 5.8–5.9), whereas the mean work ability score of the other participants was over 8. Approximately one half of those with coronary heart disease thought their work ability was limited, while only one fifth of those without this disease believed that their work ability was limited (Table 5.2). Among those with coronary heart disease, work ability was limited more often among women than among men.

The work ability score was lower, and work ability was more often limited, among those with diabetes than among the rest of the study population. In the age group 30 to 64 years, nearly 40 per cent of those who reported having diabetes estimated their work ability as being limited, while the figure for those without diabetes was less than 20 per cent.

The association between hypertension and perceived work ability was not as sharp as with coronary heart disease and diabetes. One fourth of those with hypertension reported having limited work ability, while a little over one sixth of the other participants gave the same estimation. On the other hand, hypertension was much more common than the other two conditions (Table 5.2), and thus it poses an even more significant restriction for the population's work ability than coronary disease or diabetes does.

Table 5.2. *Age-adjusted[1] mean work ability score and the proportion (%) of those with limited work ability among 30- to 64-year-olds without and with diseases of the circulatory system or diabetes.*

Disease	Work ability score	Persons with limited work ability		Prevalence of disease (%)
		Proportion (%)	OR[2]	
Coronary heart disease				
Women				
Without disease	8.2	18	1.0	
With disease	6.3***	53	7.1***	*2*
Men				
Without disease	8.0	19	1.0	
With disease	6.1***	45	4.5***	*4*
Hypertension				
Women				
Without disease	8.2	17	1.0	
With disease	8.0**	24	1.7***	*25*
Men				
Without disease	8.1	18	1.0	
With disease	7.5***	25	1.6***	*28*
Diabetes				
Women				
Without disease	8.2	18	1.0	
With disease	7.2***	40	3.7***	*3*
Men				
Without disease	8.0	19	1.0	
With disease	6.7***	39	3.3***	*5*

[1] Age-adjustment was based on a model including gender and age as explanatory variables, and the figures for women and men are therefore comparable. The analyses include 2,692–2,692 women and 2,485–2,487 men, depending on the disease in question.
[2] The odds ratio (OR) depicts the prevalence of limited work ability among those with the disease in question in comparison with the corresponding prevalence of those who did not report the disease. Statistical significance of the difference: *p<0.05, **p<0.01, ***p<0.001.

5.1.3 Respiratory diseases

Of the chronic respiratory diseases, asthma was relatively common among the working-age participants. In the age group 30 to 64 years, altogether 9 per cent of women and 6 per cent of men reported having asthma. The work ability of men with asthma was clearly more often limited than that of other men, whereas the association between asthma and limited work ability was rather weak among women (Table 5.3).

Table 5.3. *Age-adjusted[1] mean work ability score and the proportion (%) of those with limited work ability among 30- to 64-year-olds without and with respiratory diseases.*

Disease	Work ability score	Persons with limited work ability		Prevalence of disease (%)
		Proportion (%)	OR[2]	
Asthma				
Women				
Without disease	8.2	18	1.0	
With disease	7.7**	26	1.6**	9
Men				
Without disease	8.0	19	1.0	
With disease	7.1***	36	2.9***	6
Bronchial obstruction and/or chronic bronchitis				
Women				
Without disease	8.2	18	1.0	
With disease	7.2***	39	3.7***	4
Men				
Without disease	8.0	19	1.0	
With disease	6.8***	36	2.8***	5

[1] Age-adjustment was based on a model including gender and age as explanatory variables, and the figures for women and men are therefore comparable. The analyses include 2,691–2,692 women and 2,485–2,487 men, depending on the disease in question.
[2] The odds ratio (OR) depicts the prevalence of limited work ability among those with the disease in question in comparison with the corresponding prevalence of those who did not report the disease. Statistical significance of the difference: *p<0.05, **p<0.01, ***p<0.001.

Among men with bronchial obstruction or chronic bronchitis, perceived work ability was limited as often as among men with asthma. Among women bronchial obstruction or chronic bronchitis was more strongly associated with work ability than asthma was. However, due to their relatively low prevalence bronchial obstruction and chronic bronchitis affect the population's work ability clearly less than asthma does.

5.1.4 Musculoskeletal disorders

Almost one third of all 30- to 64-year-olds reported having medically diagnosed back disorders, and one fifth of women and over one tenth of men reported having neck problems. The other musculoskeletal disorders listed in Table 5.4, osteoarthritis of the knee or hand and, in particular, osteoarthritis of the hip were less common (Table 5.4).

Table 5.4. *Age-adjusted[1] mean work ability score and the proportion (%) of those with limited work ability among 30- to 64-year-olds without and with musculoskeletal disorders.*

Disease	Work ability score	Persons with limited work ability		*Prevalence of disease (%)*
		Proportion (%)	OR[2]	
Osteoarthritis of the knee				
Women				
Without disease	8.2	18	1.0	
With disease	7.2***	36	3.1***	*7*
Men				
Without disease	8.0	19	1.0	
With disease	7.1***	33	2.4***	*7*
Osteoarthritis of the hip				
Women				
Without disease	8.2	19	1.0	
With disease	7.2**	38	3.4***	*2*
Men				
Without disease	8.0	20	1.0	
With disease	6.4***	52	6.2***	*2*
Osteoarthritis of the hand				
Women				
Without disease	8.2	17	1.0	
With disease	7.4***	36	3.2***	*8*
Men				
Without disease	8.0	20	1.0	
With disease	6.8***	36	2.7***	*3*
Back disorder				
Women				
Without disease	8.3	16	1.0	
With disease	7.8***	26	2.2***	*28*
Men				
Without disease	8.1	17	1.0	
With disease	7.5***	26	1.8***	*32*
Neck disorder				
Women				
Without disease	8.2	17	1.0	
With disease	7.8***	27	2.1***	*20*
Men				
Without disease	8.0	18	1.0	
With disease	7.2***	33	2.6***	*12*

[1] Age-adjustment was based on a model including gender and age as explanatory variables, and the figures for women and men are therefore comparable. The analyses include 2,692–2,693 women and 2,486 men, depending on the disease in question.

[2] The odds ratio (OR) depicts the prevalence of limited work ability among those with the disease in question in comparison with the corresponding prevalence of those who did not report the disease. Statistical significance of the difference: *p<0.05, **p<0.01, ***p<0.001.

Of the aforementioned musculoskeletal disorders, osteoarthritis of the hip had the strongest relationship with limited work ability, especially among men. The work ability score was 6.4 for men and 7.2 for women. Slightly over half of the men and nearly 40 per cent of the women with osteoarthritis of the hip estimated that their work ability was limited (Table 5.4). Limited work ability was also somewhat more prevalent among the respondents with osteoarthritis of the knee or hand than among those with back or neck disorders. However, of the musculoskeletal disorders, neck and, especially, back disorders were the most important causes of limited work ability in the whole population because of their high prevalence.

5.1.5 Mental disorders

Approximately every ninth 30- to 64-year-old woman and every fourteenth man reported having been diagnosed as suffering from depression at some point in their lives (Table 5.5). Slightly more than 1 per cent of the interviewed persons reported a medically diagnosed psychosis. These estimates of the prevalence of depression and psychosis, based on the interview data, correspond well with those coming from other sources (See Pirkola et al. 2005; The Social Insurance Institution 2007). Only 4 per cent of working-age women and 2 per cent of working-age men reported a medically diagnosed anxiety disorder. Apparently most of the anxiety disorders were not mentioned in the interviews because approximately 7–17 per cent of the western population has been estimated to have suffered from such problems during the past 12 months (WHO 2000).

Of these mental disorders, psychosis had the strongest association with self-evaluated limitations in work ability. Among those who reported psychosis, only every fourth man and slightly more than every third woman considered themselves not to have problems with work ability (Table 5.5). Of those who reported depression or anxiety, about one half regarded their work ability to be good.

When the work ability score was examined, psychosis did not differ from the other mental disorders. The work ability score of men who reported having suffered from psychosis was even closer to their lifetime best than the estimation of those who reported depression or anxiety. This slightly surprising observation may be explained by the fact that most people who suffer from psychosis have become ill at a young age. Therefore their work ability at best may have been rather low in the first place.

Because of the high prevalence of depression, this disorder had an even stronger effect on the work ability of the study population than psychosis did. Depression had a strong association with work ability in all age groups and also among both genders. If depression were eliminated as a cause of limited work ability among those aged 45 to 54 years, for example, only 13 per cent of women in this age group would consider their work ability limited. As the proportion of women with limited work ability in this age group was 17 per cent, eliminating depression would mean that approximately one fourth of all the limitations to work ability among 45- to 54-year-old women would disappear.

Table 5.5. *Age-adjusted[1] mean work ability score and the proportion (%) of those with limited work ability among 30- to 64-year-olds without and with mental disorders.*

Mental disorders	Work ability score	Persons with limited work ability		*Prevalence of disease (%)*
		Proportion (%)	OR[2]	
Depression				
Women				
Without disease	8.4	16	1.0	
With disease	6.7***	43	5.7***	*11*
Men				
Without disease	8.1	18	1.0	
With disease	6.2***	47	5.9***	*7*
Psychosis				
Women				
Without disease	8.2	19	1.0	
With disease	6.5***	62	11.7***	*1*
Men				
Without disease	7.9	20	1.0	
With disease	6.8*	74	21.4***	*1*
Anxiety				
Women				
Without disease	8.2	18	1.0	
With disease	6.9***	42	4.4***	*4*
Men				
Without disease	8.0	19	1.0	
With disease	6.1***	53	6.9***	*2*

[1] Age-adjustment was based on a model including gender and age as explanatory variables, and the figures for women and men are therefore comparable. The analyses include 2,689–2,691 women and 2,483 men, depending on the disorder in question.

[2] The odds ratio (OR) depicts the prevalence of limited work ability among those with the illness in question comparison with the corresponding prevalence of those who did not report the illness. Statistical significance of the difference: *p<0.05, **p<0.01, ***p<0.001.

5.1.6 Allergies

Nearly every fourth working-age woman and every sixth working-age man reported a disturbing allergy. Approximately one fourth of those who suffered from a disturbing allergy evaluated their work ability as limited, whereas the respective figure was less than one fifth for the rest of the study population. Even though the effect was rather small at the individual level, the high prevalence of allergies implies that they significantly decrease the population's work ability.

5.1.7 Relation between diseases and work ability according to employment status

Determining the effect of diseases on the work ability of the workforce is especially relevant for succeeding in attempts to increase the employment rate. In endeavouring to reduce early retirement, we must place special emphasis on the prevention, treatment, and relief of the consequences of diseases that limit the work ability of employed and unemployed people.

Table 5.6 shows the relationship between the diseases that reduced the work ability of all 30- to 64-year-olds the most and the work ability score of those employed, those unemployed, and those on a disability pension. The information on employment status was based on the interview. From the table it is evident that the prevalence of almost all of the diseases was highest among those on a disability pension and lowest among those employed, with the unemployed located between these two groups. The same order was maintained for work ability. The average work ability score was highest for those employed and lowest for those on a disability pension. (See also Section 4.4.)

There was a strong association between diseases and work ability among those employed. For most of the diseases, the work ability score of those who reported the disease was considerably lower than that of those who did not have the disease. For the unemployed, the difference in the work ability score of those who were ill and those who were not ill was at least as large as that found for the employed for nearly all diseases listed in Table 5.6, but some differences were not statistically significant because of the small number of cases.

Table 5.6. *Relationship between the work ability score and the occurrence of different diseases among 30- to 64-year-olds, according to employment status.*[1]

	Women			Men		
	Employed n=1,856	Unemployed n=336	On a disability pension n=204	Employed n=1,844	Unemployed n=270	On a disability pension n=246
Coronary heart disease						
Prevalence of disease	*1*	*2*	*3*	*2*	*4*	*8*
Work ability score						
Without disease	8.6	7.8	5.0	8.6	7.4	4.5
With disease	(8.3)	(6.0)	(5.0)	7.2**	(6.3)	4.0
Hypertension						
Prevalence of disease	*23*	*29*	*29*	*26*	*30*	*33*
Work ability score						
Without disease	8.6	7.9	4.8	8.6	7.5	4.5
With disease	8.4**	7.4*	5.1	8.2***	6.9*	4.3
Diabetes						
Prevalence of disease	*2*	*4*	*7*	*3*	*3*	*10*
Work ability score						
Without disease	8.6	7.8	5.0	8.6	7.4	4.4
With disease	8.2	(6.5)*	(4.6)	7.8**	(6.6)	4.6
Asthma						
Prevalence of disease	*8*	*10*	*16*	*5*	*5*	*12*
Work ability score						
Without disease	8.6	7.8	5.1	8.5	7.4	4.5
With disease	8.6	7.0	4.3	8.4	(5.3)**	4.0
Osteoarthritis of the knee						
Prevalence of disease	*5*	*10*	*10*	*5*	*7*	*11*
Work ability score						
Without disease	8.6	7.9	4.9	8.6	7.4	4.5
With disease	7.9**	6.6***	5.1	8.0***	6.8	4.4
Back disorder						
Prevalence of disease	*27*	*30*	*40*	*31*	*35*	*33*
Work ability score						
Without disease	8.7	7.9	4.9	8.7	7.7	4.5
With disease	8.3***	7.3*	5.1	8.1***	6.7**	4.3
Depression						
Prevalence of disease	*8*	*18*	*35*	*5*	*16*	*19*
Work ability score						
Without disease	8.7	7.9	5.4	8.6	7.6	4.6
With disease	7.7***	6.9***	4.2***	7.6***	6.0***	3.7*
Disturbing allergy						
Prevalence of disease	*23*	*25*	*31*	*15*	*14*	*23*
Work ability score						
Without disease	8.6	7.9	5.3	8.5	7.4	4.6
With disease	8.5*	7.3*	4.9	8.5	7.1	3.6*

[1] Age adjustment was made for men and women separately. Statistical difference in the mean work ability score between those with and without a disease: *p<0.05, **p<0.01, ***p<0.001.
( ) Size of the study population at risk 6–19.

The relation between a specific disease and work ability was weak among those on a disability pension. The work ability of those with and without a disease did not differ significantly. This result may be due to the fact that all people on a disability pension have some disease that limits work ability. Those who did not have the disease in question were afflicted with another disease that limited their work ability.

Depression had a particularly strong impact on self-reported work ability. This finding was evident in each group, including those on a disability pension. Among employed men, also coronary heart disease, arterial hypertension, diabetes, osteoarthritis of the knee, and back disorders affected work ability. Of these illnesses, back disorders seemed to be the most important reason for limited work ability among employed men. The relation between diagnosed diseases and self-reported work ability was weaker among employed women than among employed men. The difference between the work ability scores of those ill and those not ill was generally smaller among women than among men. In a comparison between different diseases, depression and back disorders seemed to have the largest impact on work ability among employed women and men.

5.1.8 Relation between diseases and work ability according to physical work load

Table 5.7 shows the relation between the diseases that limited the study population's work ability the most and the work ability score in three groups formed on the basis of physical work load. The analysis includes those who had been working at some point during the 12 months prior to the interview. More than 90 per cent of these persons were still employed at the time of the study, about 5 per cent were unemployed, and 3 per cent had retired.

Even though it is probable that the sickest workers in physically demanding jobs had already retired before the study took place, all diseases listed in Table 5.7, were more prevalent among those whose work was physically demanding than among those with physically lighter occupations. However, coronary heart disease for women and asthma and disturbing allergies for men were less prevalent among those with lighter occupations.

Table 5.7. *Relationship between the work ability score and different diseases among employed 30- to 64-year-olds, according to physical work load.*[1]

	Women			Men		
	Light work[2] n=774	Fairly light work[2] n=609	Demanding work[2] n=598	Light work[2] n=729	Fairly light work[2] n=423	Demanding work[2] n=739
Coronary heart disease						
Prevalence of disease	*0*	*1*	*0*	*3*	*2*	*2*
Work ability score						
Without disease	8.8	8.7	8.4	8.8	8.6	8.3
With disease	-	-	-	8.1*	(5.6)*	(8.0)
Hypertension						
Prevalence of disease	*21*	*19*	*26*	*25*	*24*	*25*
Work ability score						
Without disease	8.8	8.7	8.5	8.9	8.7	8.4
With disease	8.7	8.6	8.2*	8.5**	8.2*	8.1*
Diabetes						
Prevalence of disease	*2*	*2*	*3*	*3*	*3*	*3*
Work ability score						
Without disease	8.8	8.7	8.5	8.8	8.6	8.4
With disease	(9.0)	(8.2)	(7.2)***	8.6	(6.9)*	7.5*
Asthma						
Prevalence of disease	*7*	*8*	*9*	*6*	*6*	*4*
Work ability score						
Without disease	8.8	8.7	8.4	8.8	8.6	8.4
With disease	8.5	8.5	8.7	9.0	8.4	7.3**
Osteoarthritis of the knee						
Prevalence of disease	*2*	*4*	*7*	*4*	*2*	*8*
Work ability score						
Without disease	8.8	8.7	8.5	8.8	8.6	8.4
With disease	(8.0)	8.2*	7.8*	8.6	(8.1)	7.8**
Back disorder						
Prevalence of disease	*26*	*24*	*30*	*26*	*30*	*36*
Work ability score						
Without disease	8.9	8.8	8.6	8.9	8.7	8.6
With disease	8.6**	8.4**	8.0***	8.5**	8.2**	7.9***
Depression						
Prevalence of disease	*9*	*8*	*10*	*5*	*6*	*5*
Work ability score						
Without disease	8.9	8.7	8.5	8.8	8.6	8.4
With disease	8.0***	7.9**	7.5***	7.8***	8.2	6.7***
Disturbing allergy						
Prevalence of disease	*22*	*21*	*25*	*18*	*16*	*14*
Work ability score						
Without disease	8.8	8.7	8.5	8.8	8.6	8.3
With disease	8.8	8.6	8.2*	8.8	8.3	8.3

[1] Age adjustment was made for men and women separately. Statistical difference in the mean work ability score between those with and without a disease: *p<0.05, **p<0.01, ***p<0.001.

[2] Physically light work = sedentary work; physically fairly light work = work that requires fairly much walking; physically demanding work = work that requires climbing stairs, lifting or carrying, or other physically demanding work.

– Size of the study population at risk 0–5.

( ) Size of the study population at risk 6–19.

The detrimental effect of diseases on work ability was the most evident in the group of workers with physically demanding jobs. All of the diseases except heart diseases, as well as asthma for women and allergies for men, decreased work ability statistically significantly. Especially those with physically demanding work who suffered from depression estimated their work ability to be poor. The work ability of those with fairly light work was most limited by back disorders. In addition, depression and osteoarthritis of the knee among women and heart diseases, hypertension, and diabetes among men had a statistically significant relationship with limited work ability. The only diseases listed in Table 5.7 that statistically significantly affected the work ability of those with physically light work were back disorders and depression, and among men also heart disease and hypertension.

5.1.9 Summary and conclusions

In the working-age population the work ability estimate was strongly related to self-rated health. Those who regarded their health to be average estimated their work ability to be limited six times more often than those who believed that they were in good health. Furthermore, those who regarded their health to be poor estimated their work ability as limited 15–20 times more often than those who regarded themselves to be healthy. Especially among women, nearly all who regarded their health to be poor also maintained that their work ability was poor. Perceived work ability and perceived health are not, however, the same thing. There were some who regarded their health to be good but perceived their work ability to be limited, and, at the same time, some of those who felt their health was poor maintained that they were perfectly capable to work. The results also showed that, although limited work ability was much more prevalent among the chronically ill than among healthy persons, problems with work ability became more common with age even among healthy persons.

Also in earlier studies, sickness and problems with work ability have not always been related. Both the healthy and the sick can have problems with work ability, but the emphasis differs. Among healthy people, problems concerning work ability are often connected with job control and its loss, whereas the physical work load plays a key role for the sick (Järvikoski et al. 1991; Mäkitalo 2003). On the other hand, the strong relationship between self-assessed work ability and health implies that, even if workers feel that work disability is a broader concept

than detriments due to illness, it is still generally associated with disease. Cross-sectional data do not indicate, however, whether the direction of effect is always from disease to a deterioration in work ability. It may as well be, for example, that a career of disability has been controlled by social factors, in which limited work ability that is mainly caused by problems in worklife only later becomes associated with symptoms of disease (see Järvikoski 1994; Eriksen and Palmer 1997).

The results showed that all common chronic diseases limit the work ability of the population. Of the diseases mentioned in this chapter, mental disorders (especially psychosis) and coronary heart disease are the most strongly associated with limited work ability. The importance of a disease in limiting the population's work ability depends, however, both on the prevalence of the disease and on the impact of the disease on the work ability of the individual. Thus a rare disease that severely limits the work ability of a single person may have a smaller impact on the work ability of the population than more general diseases that have a less severe effect on work ability. According to the interview data, common diseases such as depression, back and neck disorders, and hypertension seemed to limit the work ability of the study population the most. Depression and back disorders are also the most common medical reasons for a disability pension. In 2006, 19 per cent of those who were granted a disability pension suffered from depression or some other mood disorder, and 14 per cent had a back disorder (Finnish Centre for Pensions and The Social Insurance Institution of Finland 2007a).

Of the diseases considered in our study, depression and back disorders were also the most important sources of work ability problems among those employed. Both were associated with limited work ability not only among those with physically demanding jobs, but also among those with lighter jobs. This observation is probably connected to the results presented in Section 4.5 concerning problems with coping at work in different occupational groups. Problems concerning physical work load were also common among white-collar occupations, and, on the other hand, problems with mental stress were prevalent also in blue-collar occupations.

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5.2 Functional capacity

Performing well in worklife calls for a worker to have adequate physical, mental and social capacity. Nevertheless, the demands on functional capacity may vary considerably, for example, according to the nature of the job. In this study, people who reported even rather minor mobility difficulties evaluated their work ability as being much poorer than did those who had no such problems. This relation was evident both among those with physically demanding work and among those with physically light work. Problems with distant vision and hearing also negatively affected work ability.

Cognitive and social functioning were strongly related to work ability among the entire working-age population in this study, but, in separate analyses for the employed, the unemployed, and pensioners, only learning problems were related to limited work ability.

Functional capacity has an important role in the models used to determine work ability (see Section 2.2). The dimensions of work ability are associated with the components "activities" and "participation" in the International Classification of Functioning, Disability and Health (ICF) (WHO 2001). The component "activities" denotes, for example, physical and mental tasks and various skills at the individual level, whereas the component "participation" denotes aspects of functioning from a social perspective, covering work opportunities and employment, for example. The societal-, individual-, and health-related prerequisites or limitations in the domains for "activities" and "participation" thus also determine work ability.

In this section, we examine the association between functional capacity and perceived work ability among 30- to 64-year-olds. We have included in the study functions that are important from the point of view of worklife (i.e., mobility, sensory functions, cognitive skills, and social interaction).

Good physical condition has been found to be related to good perceived work ability (Goedhard et al. 1997; Pokorski et al. 2004; Bugajska et al. 2005).

The following section examines one dimension of physical functioning, mobility. Are difficulties in running or climbing stairs related to the work ability of the working-age population, or is coping in modern worklife more related to mental performance? The other functional limitations that were studied are related to vision, hearing, learning, memory, and interactive skills. One would assume that especially fluent cognitive and social skills would be related to good perceived work ability. We have also taken into consideration the physical demands of work. Does the association between functional limitations and work ability appear in the same manner among workers doing physically heavy work as it does among those with physically light jobs?

5.2.1 Mobility

Only slightly over half of all 30- to 64-year-old women and about two thirds of men thought they could run half a kilometer without difficulty. Difficulties in walking 2 kilometers and climbing several flights of stairs were rarer than difficulties in running. A 2-kilometer walk was considered difficult by as many women as men, but more physically demanding tasks such as running and climbing stairs were more often perceived to be difficult by women than men (Table 5.8).

All indicators of mobility problems were strongly related to work ability. This relationship was the most evident for difficulties in walking among men. Nearly 80 per cent of the men who had difficulties walking 2 kilometers reported that they were partially or totally unable to work. On the other hand, only 15 per cent of those who could walk without difficulty considered their work ability to be limited. While the work ability score was only 4.2 for the men with difficulties in walking, it was almost twofold higher among the other men (8.2). Difficulties in walking were strongly related to perceived work ability also among women. The ability to climb stairs had the second strongest association with work ability. A clear association with the ability to run was also evident, even though jobs only rarely demand running. Every other 30- to 64-year-old woman reported difficulties in running half a kilometer (Table 5.8), and over one fourth of these women perceived their work ability to be limited. On the other hand, only 6 per cent of the 50 per cent who thought they would have no problem running perceived their work ability to be limited. However, limitations to work ability increased among both women and men with age regardless of their degree of mobility.

Table 5.8. *Age-adjusted[1] mean work ability score and the proportion (%) of those with limited work ability among 30- to 64-year-olds, according to mobility.*

	Work ability score	Persons with limited work ability		*Prevalence of difficulties (%)*
		Proportion (%)	OR[2]	
Running 0.5 km				
Women				
Without difficulty	8.7	6	1.0	
With difficulty or unable	7.6***	28	6.8***	*48*
Men				
Without difficulty	8.5	9	1.0	
With difficulty or unable	6.6***	38	8.1***	*31*
Walking 2 km				
Women				
Without difficulty	8.4	15	1.0	
With difficulty or unable	5.5***	66	18.5***	*8*
Men				
Without difficulty	8.2	16	1.0	
With difficulty or unable	4.2***	78	34.5***	*7*
Climbing several flights of stairs				
Women				
Without difficulty	8.5	12	1.0	
With difficulty or unable	6.3***	52	11.4***	*14*
Men				
Without difficulty	8.2	15	1.0	
With difficulty or unable	4.9***	68	18.9***	*8*

[1] Age-adjustment was based on a model including gender and age as explanatory variables, and the figures for women and men are therefore comparable. The analyses include 2,644–2,682 women and 2,438–2,482 men, depending on the measure used to determine mobility.
[2] The odds ratio (OR) depicts the prevalence of limited work ability among those with mobility difficulties in comparison with the corresponding prevalence of those with no difficulties. Statistical significance of the difference: *p<0.05, **p<0.01, ***p<0.001.

5.2.2 Visual and hearing difficulties

The relation between visual and hearing problems and work ability was clear but somewhat weaker than that of the aforementioned mobility limitations. Limited work ability was the most prevalent among those who had difficulties with distant vision. About half of the 30- to 64-year-olds who had difficulty reading the subtitles on the television regarded their work ability as limited, whereas only approximately 18 per cent of those without such problems considered their work

ability limited (Table 5.9). Difficulties with near vision and, especially among men, hearing problems were clearly less related to work ability. The relative significance of problems with vision and hearing was greatest in the younger age groups. For example, of the 30- to 44-year-olds who had trouble seeing text on the television, almost one half regarded their work ability as limited, whereas only approximately 6 per cent of those with normal vision reported limited work ability. Limitations in work ability became more frequent with age among both men and women, but this tendency was not as strong among those who reported visual or hearing problems as among others.

Table 5.9. *Age-adjusted[1] mean work ability score and the proportion (%) of those with limited work ability among 30- to 64-year-olds, according to visual and hearing ability.*

Visual and hearing ability	Work ability score	Persons with limited work ability		*Prevalence of difficulties (%)*
		Proportion (%)	OR[2]	
Reading a newspaper				
Women				
Without difficulty	8.2	18	1.0	
With difficulty or unable	7.0***	36	3.2***	*4*
Men				
Without difficulty	8.0	19	1.0	
With difficulty or unable	7.1***	37	3.0***	*4*
Watching television				
Women				
Without difficulty	8.2	18	1.0	
With difficulty or unable	6.5***	49	6.2***	*2*
Men				
Without difficulty	8.0	19	1.0	
With difficulty or unable	5.9***	54	7.5***	*2*
Listening to conversation				
Women				
Without difficulty	8.2	17	1.0	
With difficulty or unable	7.4***	33	2.7***	*8*
Men				
Without difficulty	8.0	19	1.0	
With difficulty or unable	7.2***	28	1.9***	*13*

[1] Age-adjustment was based on a model including gender and age as explanatory variables, and the figures for women and men are therefore comparable. The analyses include 2,668–2,692 women and 2,453–2,483 men, depending on the measure describing sensory activity.

[2] The odds ratio (OR) depicts the prevalence of limited work ability among those with visual or hearing difficulties in comparison with the corresponding prevalence of those with no difficulties. Statistical significance of the difference: *p<0.05, **p<0.01, ***p<0.001.

5.2.3 Cognitive functioning

Selected tasks from the CERAD neuropsychological test battery (Morris et al. 1989), more specifically the tests on verbal fluency and learning a list of ten words, were used to determine cognitive functioning.

Verbal fluency was tested by asking the participants to list as many animals as possible in 1 minute. Approximately 6 per cent listed fewer than 15 animals. This group evaluated their work ability as clearly weaker than those who did better on the test (Table 5.10).

Table 5.10. *Age-adjusted[1] mean work ability score and the proportion (%) of those with limited work ability among 30- to 64-year-olds, according to cognitive functioning.*

Cognitive functioning	Work ability score	Persons with limited work ability		*Prevalence of difficulties (%)*
		Proportion (%)	OR[2]	
Verbal fluency				
Women				
At least 15 words	8.2	18	1.0	
Fewer than 15 words	7.3**	39	3.7***	*4*
Men				
At least 15 words	8.0	19	1.0	
Fewer than 15 words	7.4***	29	2.0***	*8*
Learning				
Women				
At least 8 words	8.3	17	1.0	
Fewer than 8 words	7.7***	26	2.0***	*17*
Men				
At least 8 words	8.1	16	1.0	
Fewer than 8 words	7.5***	26	2.0***	*31*

[1] Age-adjustment was based on a model including gender and age as explanatory variables, and the figures for women and men are therefore comparable. The analyses include 2,570–2,577 women and 2,324–2,331 men, depending on the measure used to determine cognitive functioning.
[2] The odds ratio (OR) depicts the prevalence of limited work ability among those with difficulties in cognitive functioning in comparison with the corresponding prevalence of those with no such difficulties. Statistical significance of the difference: *p<0.05, **p<0.01, ***p<0.001.

In the test on learning using a list of 10 words, 17 per cent of women and as many as 31 per cent of men remembered fewer than 8 words after three readings. There was a statistically significant relation between remembering fewer than 8 words and perceived work ability (Table 5.10).

5.2.4 Social functioning

It is more problematic to measure the capacity of people to interact with others than to measure, for example, their mobility or memory since social interaction refers to the performance and participation of other persons in addition to the persons themselves. Interactive skills cannot be defined only on the basis of individual mental or physical prerequisites. (See Talo and Hämäläinen 1997.) Therefore, empirical studies have often settled for measuring the extent of social participation and the fluency of human relations rather than social functioning itself (Mäkitalo 2001).

In this study, the indicator for social functioning was based on two questions concerning everyday interactive situations. The questions investigated how the respondent coped in handling affairs with others and in presenting issues to strangers. We considered interactive skills to be limited if there was a problem in at least one of these areas.

Only 2–3 per cent of 30- to 64-year-olds reported problems with social interaction. The problems were strongly associated with perceived work ability. A large proportion of people with such problems evaluated their work ability as limited, and this trend was more evident among men than among women (Table 5.11). It was very common even in the youngest age group for people with social problems to have limited work ability.

Table 5.11. *Age-adjusted[1] mean work ability score and the proportion (%) of those with limited work ability among 30- to 64-year-olds, according to social functioning.*

Social interaction[2]	Work ability score	Persons with limited work ability		*Prevalence of difficulties (%)*
		Proportion (%)	OR[3]	
Women				
Without difficulty	8.2	18	1.0	
With difficulty or unable	6.0***	60	11.1***	*2*
Men				
Without difficulty	8.0	19	1.0	
With difficulty or unable	5.4***	68	16.1***	*3*

[1] Age-adjustment was based on a model including gender and age as explanatory variables, and the figures for women and men are therefore comparable. The analysis included 2,691 women and 2,485 men.
[2] Handling affairs with others or presenting issues to strangers.
[3] The odds ratio (OR) depicts the prevalence of limited work ability among those with difficulties in social functional capacity in comparison with the corresponding prevalence of those without such difficulties. Statistical significance of the difference: *p<0.05, **p<0.01, ***p<0.001.

5.2.5 Relation between functional capacity and work ability according to employment status

All limitations in functional capacity included in our study were the most common among those on a disability pension and the least common among those employed (Table 5.12). The unemployed fell between these two groups. For example, only a few per cent of those employed had problems with walking, whereas every tenth unemployed person, and approximately every third disability pensioner had such problems. The relation between the capacity to walk and work ability was statistically highly significant for each employment status group. Regardless of the work situation, people with problems in walking considered their work ability to be clearly worse than those without such problems.

The same was true for those with vision or hearing impairments. They estimated their work ability to be poorer than other people did regardless of whether they were employed or unemployed.

In Section 5.2.3 verbal fluency was found to be related to perceived work ability in the entire 30- to 64-year-old population (Table 5.10). When the population was divided into the employed, the unemployed, and people on a disability pension, this association no longer existed. Verbal fluency was not related to the work ability score in any of the employment status groups. On the other hand, the ability to learn seemed to be related to perceived work ability among those employed and also among the unemployed men. Cognitive functioning was not found to be related to perceived work ability among those on a disability pension. Regardless of their cognitive skills, people on a disability pension considered their work ability to be rather poor – about 45 per cent of their lifetime best.

Problems with social interaction were very rare among those employed. Only 1 per cent had such problems. The small number of persons may explain the surprising result that problems with social functioning were not related to work ability among those employed. On the other hand, those women on a disability pension who had experienced problems with social interaction had a clearly lower work ability score than the women who had had no such problems (Table 5.12).

Table 5.12. *Relationship between the work ability score and functional capacity among 30- to 64-year-olds according to employment status.*[1]

	Women			Men		
	Employed n=1,856	Unemployed n=336	On a disability pension n=204	Employed n=1,844	Unemployed n=270	On a disability pension n=246
Walking 2 km						
Prevalence of difficulties	*4*	*10*	*37*	*2*	*11*	*28*
Work ability score						
Without difficulty	8.7	7.9	5.8	8.6	7.7	5.4
With difficulty or unable	7.1***	6.0***	4.0***	6.6***	4.5***	2.8***
Watching television						
Prevalence of difficulties	*1*	*2*	*9*	*1*	*3*	*8*
Work ability score						
Without difficulty	8.6	7.8	5.3	8.5	7.4	4.5
With difficulty or unable	8.3	(6.6)*	(3.9)*	(7.7)*	(5.7)	4.3
Listening to conversation						
Prevalence of difficulties	*8*	*10*	*13*	*11*	*13*	*16*
Work ability score						
Without difficulty	8.6	7.8	5.1	8.6	7.6	4.5
With difficulty or unable	8.1***	7.1**	4.4	8.1***	6.1***	4.3
Verbal fluency						
Prevalence of difficulties	*3*	*6*	*19*	*6*	*13*	*17*
Work ability score						
At least 15 words	8.6	7.7	5.0	8.5	7.4	4.5
Fewer than 15 words	8.6	6.8	5.1	8.4	7.1	4.9
Learning						
Prevalence of difficulties	*14*	*23*	*30*	*27*	*42*	*42*
Work ability score						
At least 8 words	8.6	7.8	5.0	8.6	7.6	4.3
Fewer than 8 words	8.4*	7.4	5.0	8.3***	6.9*	4.7
Social interaction						
Prevalence of difficulties	*1*	*3*	*22*	*1*	*5*	*23*
Work ability score						
Without difficulty	8.6	7.7	5.2	8.5	7.4	4.5
With difficulty or unable	(8.4)	(7.8)	3.2**	(8.3)	(6.1)	3.9

[1] Age adjustment was made for men and women separately. Difference in the mean work ability score between those with and without difficulties in functional capacity: *p<0.05, **p<0.01, ***p<0.001.
( ) Size of the study population at risk 6–19.

5.2.6 Relation between functional capacity and work ability according to physical work load

Most jobs require a range of functional capacity. In the following section, we examine the association of mobility and learning problems with perceived work ability in three groups formed on the basis of physical work load.

Walking 2 kilometers was only rarely a problem for anyone who worked regardless of whether their work was physically demanding or not. However, in all three physical work demand groups, people with walking limitations perceived their work ability to be poorer than did those who could walk the distance (Table 5.13).

Table 5.13. *Relationship between the work ability score and functional capacity among employed 30- to 64-year-olds, according to physical work load.*[1]

	Women			Men		
	Light work[2]	Fairly light work[2]	Demanding work[2]	Light work[2]	Fairly light work[2]	Demanding work[2]
	n=774	n=609	n=598	n=729	n=423	n=739
Walking 2 km						
Prevalence of difficulties	*3*	*3*	*4*	*3*	*1*	*2*
Work ability score						
Without difficulty	8.8	8.7	8.5	8.8	8.6	8.4
With difficulty or unable	7.9**	(7.3)**	6.7***	(7.4)**	-	(6.2)***
Learning						
Prevalence of difficulties	*11*	*13*	*16*	*22*	*23*	*33*
Work ability score						
At least 8 words	8.8	8.7	8.5	8.8	8.6	8.4
Fewer than 8 words	8.7	8.7	8.1*	8.6*	8.4	8.2

[1] Age adjustment was made for men and women separately. Statistical difference in the mean work ability score between those with and without difficulties in functional capacity: *p<0.05, **p<0.01, ***p<0.001.
[2] Physically light work = sedentary work; physically fairly light work = work that requires fairly much walking; physically demanding work = work that requires climbing stairs, lifting or carrying, or other physically demanding work.
– Size of the study population at risk 0–5.
( ) Size of the study population at risk 6–19.

It can be assumed that cognitive impairment would limit work ability more or less depending on how great the mental and, especially, cognitive demands of the job are. We had no specific information on these demands, but it can be assumed that a large proportion of people who have physically light jobs are involved in cognitively demanding tasks, whereas the cognitive demands in physically heavier jobs may not, on average, be as great. However, according to the test on learning a wordlist, the relation between cognitive impairment and work ability was weak in all of the groups formed on the basis of the physical demand of the job (Table 5.13).

5.2.7 Summary and conclusions

Among 30- to 64-year-olds, perceived work ability had a very strong relation to mobility limitations and problems in social functioning, whereas the relation to visual, hearing, and cognitive impairments was weaker.

It was also found that mobility limitations were clearly associated with poor work ability in all employment status groups – the employed, the unemployed, and persons on a disability pension – as well as in the groups formed on the basis of physical work demands. This finding indicates that mobility problems limit functional capacity to the point that they generally hinder coping at work, regardless of the nature of the work. However, further research is needed to clarify what strengths of the workers and characteristics of the work process, work community, or work organization explain the fact that some people with mobility limitations regard their work ability as being very good.

The indicators of cognitive functioning were related to work ability when the entire working age population was taken into consideration. Especially difficulties in verbal fluency were associated with poor perceived work ability. However, when the employed, the unemployed, and those on a disability pension were examined separately, the association disappeared altogether. This result can be partly explained by the fact that problems with verbal fluency were concentrated into the group of disability pensioners. There are, however, many factors that limit work ability in this group, and the significance of a single limitation does not come to the fore. Of the indicators of cognitive functioning, only learning a list of words was associated with work ability among those employed. It is possible that cognitive limitations are minor among workers and therefore are not perceived to hinder work ability. On the other hand, it could be that there were

differences in the interpretation of what comprises work ability. The strong emphasis on illness as the cause of work disability may guide people's thinking so that problems with verbal fluency, learning, and memory are not considered to be related to work ability since they are not usually defined as an illness.

Problems with social interaction were also the most evident among those on a disability pension. This result is somewhat surprising because, as we noted in Section 4.5, problems related to the work community are often a hindrance to coping at work. Evidently the indicators of social interaction (i.e., difficulty in handling affairs with other people and in presenting issues to strangers) are such severe functional limitations that people with such limitations cannot cope in worklife. Again, the question may be about the interpretation of work ability in that it may feel strange to link social skills to individual work ability.

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5.3 Expertise

Expertise is related to good work ability. Those who regarded themselves as competent to handle even the most demanding tasks assessed their work ability as the best, whereas people who had problems with their occupational skills perceived their work ability to be poorer. Expertise was the most strongly related to work ability among those with higher education, physically light jobs, and no chronic diseases.

According to the work ability models used in this study, expertise is an important part of the broad concept of work ability. (See Section 2.2.) A balance between knowledge and skills and the dimensions of one's job promotes and maintains work ability (Ilmarinen 2003). On the other hand tension between professional skills and the demands of the job lessens coping at work and can also be reflected as problems with health (Järvikoski et al. 2001).

Expertise is related to training and education. People with a better educational background are generally better prepared than those with less education. Moreover, the level of education is related to work ability in that people with higher education estimate their work ability to be better than those with less education do. (See Section 4.3.) Therefore, we examined the relation between expertise and work ability in the groups formed on the basis of the level of education.

In this section, we have used two closely related variables, the sufficiency of skills and the lack of expertise that hinders coping or managing at work as indicators of expertise. The work ability score was used as the indicator of perceived work ability. The results were similar also when the other indicators of work ability were examined.

Differences in work ability according to expertise

According to the results, expertise was related to work ability. In general, the employed 30- to 64-year-olds who possessed good skills estimated their work ability score to be higher than did those who were in need of supplementary

training. Regardless of the level of education, those who felt their skills would suffice for even more challenging tasks gave their work ability the best rating. Approximately two thirds of these respondents gave their work ability 9 or 10 points; in other words, their work ability was close to their lifetime maximum level (Table 5.14).

Table 5.14. *Age-adjusted[1] proportion (%) of those who gave themselves a high work ability score (9–10) among employed 30- to 64-year-olds, according to their expertise and level of education.*

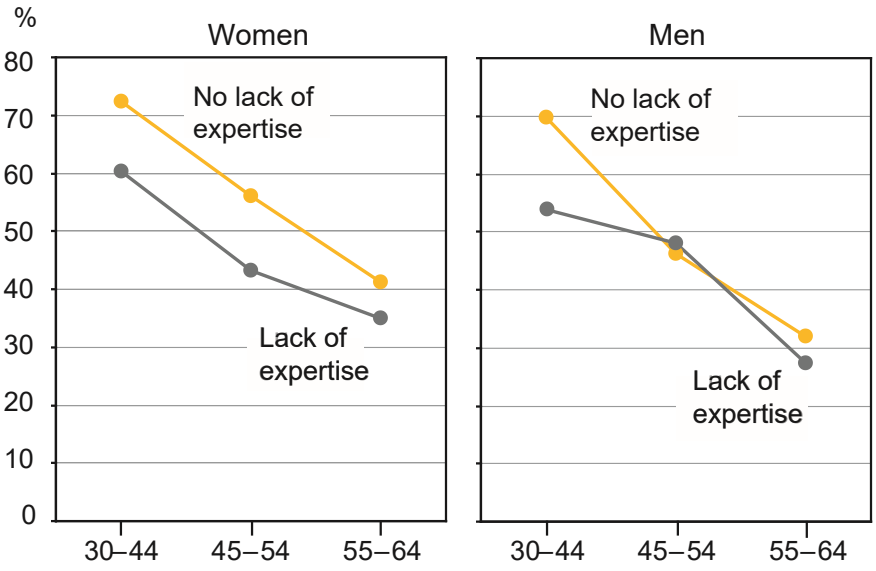
	Proportion of those who gave their work ability a score of 9–10 according to educational level				**OR[2]**	*Distribution of expertise (%)*
	Basic	Secondary	High	All	All	*All*
Sufficiency of skills						
Women						
Additional training needed	36	40	49	44	1.0	*10*
Skills correspond to tasks	53*	59**	66**	61***	2.1***	*68*
Skills would suffice for even more-demanding tasks	66*	67***	68**	68***	2.7***	*22*
						100
Men						
Additional training needed	44	51	46	48	1.0	*9*
Skills correspond to tasks	47	50	66*	54	1.3	*66*
Skills would suffice for even more-demanding tasks	61	58	67*	61**	1.8**	*25*
						100
Lack of expertise that hinders coping at work						
Women						
Lack of expertise	46	53	51	50	1.0	*16*
No lack of expertise	54	60	67**	62***	1.7***	*84*
						100
Men						
Lack of expertise	40	51	55	50	1.0	*17*
No lack of expertise	51	53	67*	57*	1.4*	*83*
						100

[1] Age adjustment was based on a model including gender and age as explanatory variables, and the figures for women and men are therefore comparable. There were 1,841 women and 1,822 men in the analysis.
[2] The odds ratio (OR) depicts the prevalence of a work ability score of 9–10 among those who had problems with expertise in comparison with the corresponding prevalence of those with no such problems. Statistical significance of the difference: *p<0.05, **p<0.01, ***p<0.001.

Likewise, those who felt that a lack of expertise or training hindered their coping and managing at work gave themselves poorer work ability scores than did those without such problems. This trend was evident in all educational groups, but a lack of expertise was related to poor work ability statistically significantly only for those with higher education. The relation between expertise and work ability was somewhat stronger among women than among men (Table 5.14).

Expertise was related to work ability more clearly among younger than older workers. The higher level of education of younger workers did not explain the differences between the age groups, however. The relation between high expertise and good work ability was the strongest in the younger age groups (women under the age of 55 and men under the age of 45) also when the level of education was adjusted (Figure 5.2).

Figure 5.2. *Proportion (%) of those who gave themselves a high work ability score (9–10) among employed 30- to 64-year-olds, according to expertise.* [1]



[1] Adjusted for educational level.

We also examined whether the relation between expertise and work ability was related to long-term illness. According to Table 5.15, less than one fifth of both chronically ill and those who considered themselves healthy felt that lack of expertise hindered their ability to cope at work. However, lack of expertise was related to poor work ability only among those with no chronic diseases.

Table 5.15. *Proportion (%) of those who gave themselves a high work ability score (9–10) among employed 30- to 64-year-olds, according to expertise and chronic morbidity.*[1]

Lack of expertise that hinders coping at work	With long-term illnesses Work ability score 9 or 10 %	OR[2]	*Prevalence of lack of expertise (%)*	Without long-term illnesses Work ability score 9 or 10 %	OR[2]	*Prevalence of lack of expertise (%)*
Women						
Lack of expertise	42	1.0	*17*	56	1.0	*16*
No lack of expertise	49	1.3		70	1.9**	
Men						
Lack of expertise	41	1.0	*20*	55	1.0	*16*
No lack of expertise	40	0.9		64	1.6*	

[1] Adjusted for age and educational level.
[2] The odds ratio (OR) depicts the prevalence of a work ability score of 9–10 among those who had no lack of expertise in comparison with the corresponding prevalence of those with a lack of expertise. Statistical significance of the difference: *p<0.05, **p<0.01, ***p<0.001. The analysis included 1,840 women and 1,821 men.

Summary and conclusions

The study of expertise and perceived work ability supported the association predicted by the work ability models. In other words, good expertise was related to good work ability.

Deficiencies in expertise were the most clearly related to poor work ability among those with the highest education and the young. This result may indicate that expertise is especially considered part of work ability in information-intense jobs, whereas, in jobs that require manual skills, expertise and work ability are considered separately.

In addition, it was also evident that expertise was related to work ability only among those with no chronic diseases. This finding may indicate that chronically ill people assess their work ability primarily according to the hindrances caused by their diseases, leaving problems with expertise in the background. On the contrary, when there is no disease, expertise is given more emphasis in the work ability assessment.

This cross-sectional study does not indicate whether expertise promotes work ability or whether the other dimensions of good work ability support expertise. From the point of view of supporting and developing work ability, it is, however, essential that the dimension of expertise be considered an important factor related to work ability.

Raija Gould, Anu Polvinen

5.4 Attitudes towards work

Attitudes towards work are related to the will to continue in worklife. Work attitudes, such as job satisfaction and work motivation had a definite association with good work ability.

People who had positive attitudes towards work more often believed that they will still be working a few years later. In the older age groups, negative attitudes towards work especially decreased women's confidence in their future work ability. The results indicate that the means used to promote job satisfaction can also promote work ability and help workers remain in worklife.

In the model illustrated by the construction of a work ability house (Section 2.2), work-related attitudes and values form a mediating interface between work, individual functional capacity, and expertise. The way work is experienced, the work community, and work organization are filtered through a person's values and attitudes into managing and coping at work. On the other hand, for example, functional capacity and expertise are reflected in attitudes towards work.

Especially internal motivating factors are important from the point of view of work ability. They are specifically related to work content and the work itself, whereas external motivating factors emphasize economic aspects. (See, e.g., Warr 1982.) The latest research has also highlighted the effect of work engagement on work well-being. Work engagement, for example, vigour and professional self-esteem, is related to a motivational process that leads to work well-being, whereas fatigue and a cynical attitude towards work are associated with a burnout process that decreases work ability (Hakanen et al. 2005).

In this section we use job satisfaction, work motivation, cynicism, and professional self-esteem as indicators of work attitudes. Altogether 86 per cent of employed 30- to 64-year-olds were satisfied with their job, and 72 per cent were motivated to do their work. Another 16 per cent had cynical attitudes, or rather they were not enthusiastic about their work and did not believe in its importance. On the other hand, 77 per cent showed a high level of professional self-esteem.

Work ability and attitudes towards work

Attitudes towards work were clearly related to self-estimated work ability. Satisfied, motivated, and non-cynical people or those who had a high professional self-esteem perceived their work ability as better than did those with negative attitudes towards work (Table 5.16).

Table 5.16. *Age-adjusted[1] mean work ability score and the proportion (%) of those with limited work ability among employed 30- to 64-year-olds, according to attitudes towards work.*

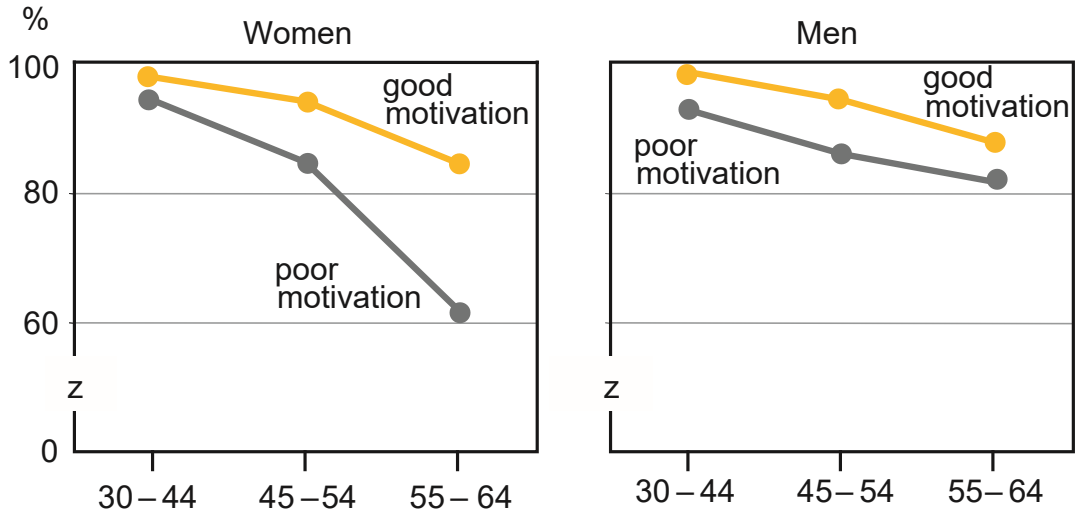
	Women			Men		
		Persons with limited work ability			Persons with limited work ability	
Attitudes towards work	Work ability score	Proportion (%)	OR[2]	Work ability score	Proportion (%)	OR[2]
Satisfaction with work[3]						
Satisfied	8.8	7	1.0	8.7	6	1.0
Dissatisfied	8.1***	18	3.2***	7.9***	15	3.1***
Work motivation[4]						
Motivated	8.8	6	1.0	8.8	5	1.0
Motivation decreased	8.4***	13	2.6***	8.1***	11	2.2***
Cynical attitude towards work[5]						
Not cynical	8.8	6	1.0	8.7	5	1.0
Cynical	8.2***	17	3.5***	7.9***	16	4.1***
Professional self-esteem[6]						
High self-esteem	8.8	6	1.0	8.7	6	1.0
Low self-esteem	8.1***	12	2.2***	8.1***	10	1.9*

[1] Age adjustment was based on a model including gender and age as explanatory variables and the figures for women and men are therefore comparable. There were 1,684–1,845 women and 1,684–1,827 men in the analysis, depending on the indicator used for attitudes towards work and work ability.
[2] The odds ratio (OR) depicts the prevalence of limited work ability among those with negative attitudes towards work in comparison with the corresponding prevalence of those with positive attitudes. Statistical significance of the difference: *p<0.05, **p<0.01, ***p<0.001.
[3] Satisfied = rather or very satisfied with work.
[4] Motivation decreased = a decrease in work motivation hinders coping at work.
[5] Cynical = score of 11–30 (range 0–30) for the items concerning cynicism in the Maslach Burnout Inventory.
[6] High self-esteem = score of 25–36 (range 0–36) for the items concerning self-esteem in the Maslach Burnout Inventory.

We also examined the relation between work attitudes and work ability with an indicator of work ability in the future: prognosis of one's work ability in 2 years' time (item 6 of the work ability index). The prognosis of work ability varied according to work attitudes (Figure 5.3). In the youngest age group, 30 to 44 years,

the views of men and women were similar. Nearly 100 per cent of those in this group who had positive attitudes towards work believed they could continue to work, and over 90 per cent of those with negative attitudes felt the same. However, in the oldest age group, the situation among women and men differed. Among the 55- to 65-year-olds with negative attitudes towards work, more than 80 per cent of men but only 60 per cent of women believed they could work for two more years

Figure 5.3. *Proportion (%) of those who believed they would be healthy enough to continue to work in their current job for the next 2 years, according to work motivation.*



[1] The occurrence of a chronic disease was adjusted for.
Statistical significance of the difference in work ability between the motivated and unmotivated workers and cynical and not cynical workers: *p<0.05, **p<0.01, ***p<0.001.

Summary and conclusions

A positive attitude towards work was related to good work ability. People with positive attitudes towards work experienced fewer limits to their work ability, and they estimated that they would be able to continue working in the same job for the next 2 years more often than did those with negative attitudes. The relation between work attitudes and work ability was evident both with respect to cynicism towards work, which is characteristic of burnout, and with respect to positive motivational factors that are characteristic of work engagement, such as professional self-esteem.

The cross-sectional nature of the study did not allow us to speculate about whether good work ability was the reason or the cause for positive work attitudes or whether they were both related to similar characteristics of worklife or simply to a positive frame of mind. The strong and systematic way in which work attitudes and perceived work ability were related, nevertheless, supports the idea that attempts to improve job satisfaction would probably result in an increase in work ability and longer careers.

Jorma Seitsamo, Kaija Tuomi, Juhani Ilmarinen, Raija Gould

5.5 Work and the work environment

Of the factors related to the demands and content of work, mental strain and exhaustion had the strongest relationship to limitations in work ability. These relations were especially strong among those who were close to retirement. The relation between the physical demands of work and work ability were weaker than that between mental demands and work. However, detrimental physical strain was more common than mental strain.

Many characteristics influence work ability and its limitations. Therefore, when activities to maintain work ability are planned, it is useful to determine, on a broad basis, the occurrence of work features that are harmful to work ability and to find ways to rectify them.

According to the work ability models presented in Section 2.2, with the exception of workers' functional capacity, work is the most important factor related to work ability. Work demands and resources, the work environment, the work community, the work organization, the work process, and the entire work culture affect perceived work ability and define the norms of good work ability. Previous studies have shown that many positive aspects of work, such as possibilities to influence work and to improve oneself, are related to good work ability, whereas stressful work demands are related to a deterioration in work ability (e.g., Tuomi 1997; Tuomi et al. 2004; Goedhard and Goedhard 2005).

In this section, we examine the relationship between work ability and the demands and content of work. The data on the 30- to 64-year-olds who had been working during the 12 months prior to the study were used for this purpose. Most of these respondents were also working at the time of the study. Therefore, we have called this group "those employed". As an indicator of work ability we have primarily used the work ability estimate (Section 3.2).

5.5.1 Physical demands and mental strain of work

Of the physical demands of work, heavy physical work, strenuous work with hands, and poor work postures were the strongest indicators of work ability. The proportion of people with limited work ability was the greatest among men in physically demanding jobs, whereas there was no difference in perceived work ability among those with physically light or fairly light work. However, the means of the work ability score and the work ability index were best for those with physically light work (Table 5.17).

Table 5.17. *Age-adjusted[1] proportion (%) of those with limited work ability and the mean of the work ability score and the work ability index among employed 30- to 64-year-olds, according to the level of physical work demands.*

Physical demands of work	Persons with limited work ability Proportion (%)	OR[2]	Work ability score	Work ability index	*Distribution of population by physical demands of work (%)*
Women					
Light work	7	1.0	8.8	40.7	*39*
Fairly light work	7	0.9	8.7	40.1*	*31*
Demanding work	13	2.1***	8.5***	38.3***	*30*
Total	8		8.7	39.8	*100*
Men					
Light work	6	1.0	8.8	41.4	*39*
Fairly light work	6	1.0	8.6**	40.7**	*22*
Demanding work	10	1.8**	8.3***	39.2***	*39*
Total	7		8.6	40.4	*100*

[1] Age adjustment was based on a model including gender and age as explanatory variables, and the figures for women and men are therefore comparable. There were 1,857–1,964 women and 1,754–1,874 men in the analysis, depending on the indicator of work ability.
[2] The odds ratio (OR) depicts the prevalence of limited work ability in other groups in comparison with the corresponding prevalence of the group with physically light work. Statistical significance of the difference: *p<0.05, **p<0.01. ***p<0.001.

There was a high risk of limited work ability if the work required poor work postures or strenuous work with hands more often than occasionally. The proportion of people with limited work ability in such jobs was twofold greater than the corresponding proportion in physically lighter work. The strong influence of the physical demands of work on work ability was emphasized by the fact that these detrimental factors were common. Every fifth worker had to use manual strength more often than occasionally, and poor work postures were reported by every third employed 30- to 64-year-old (Table 5.18).

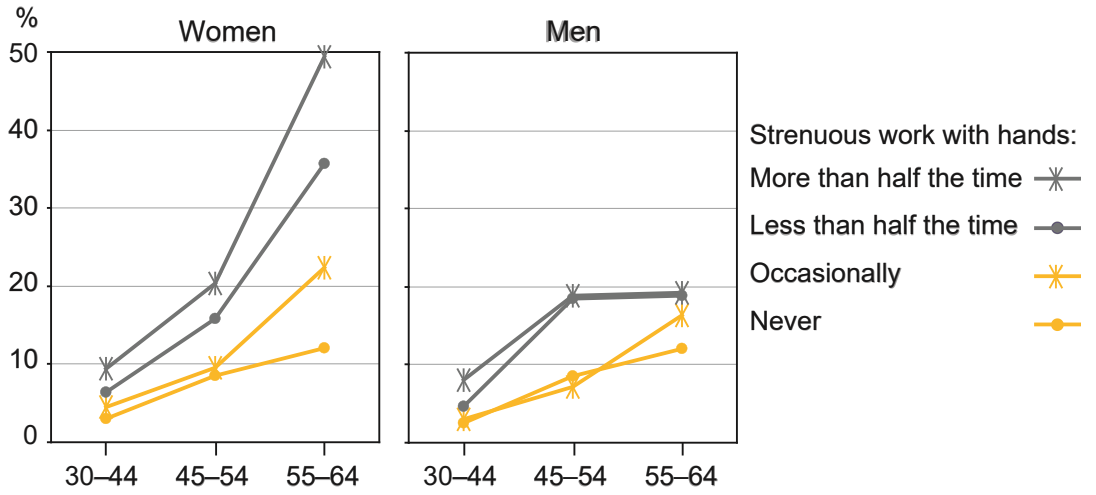
Table 5.18. *Proportion (%) of those with limited work ability among those employed, according to the physical demands and mental strain of the work.*

Work characteristic	Proportion (%) with limited work ability				OR[1]	*Prevalence of work characteristic (%)*
	30–44	45–54	55–64	30–64[2]	30–64[2]	*30–64[2]*
Poor work postures						
Women						
None or occasionally	3	8	15	6	1.0	
More often	6	16	30	13	2.2***	*32*
Men						
Never or occasionally	3	7	12	6	1.0	
More often	6	17	21	12	2.4***	*32*
Strenuous work with hands						
Women						
Never or occasionally	3	9	15	7	1.0	
More often	7	18	40	16	2.6***	*17*
Men						
Never or occasionally	3	8	13	6	1.0	
More often	6	18	19	12	2.2***	*25*
Utterly exhausted from work						
Women						
Less than once a week	3	7	16	6	1.0	
At least once a week	18	36	44	27	5.9***	*9*
Men						
Less than once a week	3	8	13	6	1.0	
At least once a week	20	49	43	33	8.8***	*7*
Work feels very stressful						
Women						
Less than once a week	3	7	15	6	1.0	
At least once a week	22	47	51	34	9.3***	*9*
Men						
Less than once a week	3	7	13	6	1.0	
At least once a week	16	43	42	30	7.4***	*8*
Mentally drained by work						
Women						
Less than once a week	3	8	17	7	1.0	
At least once a week	15	26	44	23	4.2***	*11*
Men						
Less than once a week	3	9	15	7	1.0	
At least once a week	17	27	27	22	4.2***	*7*

[1] The odds ratio (OR) depicts the prevalence of limited work ability among those whose work often included physical or mental demands in comparison with the corresponding prevalence of those whose work included these demands only occasionally. Statistical significance of the difference: *p<0.05, **p<0.01, ***p<0.001.
[2] Age adjustment was based on a model including gender and age as explanatory variables, and the figures for women and men are therefore comparable. There were 2,038–2,039 women and 1,943–1,945 men in the analysis, depending on the indicator.

The relation between the physical demands of work and limited work ability was especially strong among women aged 55 to 64. Among those who had to do strenuous work with their hands during at least half of their work time, every second woman rated their work ability as limited. Among men in this age group, the relation between physical work demands and work ability was notably weaker (Figure 5.4).

Figure 5.4. *Proportion (%) of those with limited work ability among those employed, according to strenuous work with hands.*



The mental strain of work was the most defined by mental exhaustion, mental work load, and a feeling of being mentally drained. Nearly every tenth worker experienced mental strain in their work weekly. Even though mental strain was not very common according to our indicators, its relation to deteriorated work ability was strong. The greatest risk for limited work ability was found for those who felt that their work was very stressful daily or who were weekly utterly exhausted by their work (Table 5.18).

The relation between mental work load and work ability was evident among all of those employed, and the association was strong also in the youngest age group. Even though work ability was generally poorer in the older age groups than in the younger ones, there were more persons with limited work ability among those 30- to 44-year-olds who experienced work strain than among the 55- to 64-year-olds who rarely experienced work strain (Table 5.18).

5.5.2 Independence and opportunities to improve oneself at work

Variables that depict the level of independence at work were not related to work ability as strongly as the mental strain of work. Minimal opportunities to make independent decisions and to influence one's work were the strongest indicators of limited work ability (Table 5.19). Even though women reported more restrictions on their independence at work than men did, the restrictions limited women's work ability less than the restrictions on men. Nevertheless, being able to influence one's work and to make independent decisions was related to good work ability also among women.

Opportunities to improve oneself was examined with the use of the following items: "opportunities to develop one's special skills" and "work requires new things to be learned". Few opportunities to develop one's special skills was especially related to an increased risk of limited work ability among men (Table 5.19). Approximately every third 55- to 64-year-old man with few opportunities to develop his skills reported limited work ability. On the other hand, few opportunities to learn new things was related to an increased risk of limited work ability among women, in particular. Every other 55- to 64-year-old woman whose job did not require learning new things reported limited work ability.

5.5.3 Support of supervisors and the work community

Both among women and men limited work ability was more common in work communities in which there were limited opportunities to discuss goals. Receiving respect from supervisors was also related to work ability, especially among men (Table 5.20). Among women, the support from colleagues was the most strongly related to work ability. In all of the age groups, those women who did not receive support from their fellow workers when needed believed their work ability to be poorer than did those who felt they did get needed support. With men, a lack of support from colleagues was related to work ability only among those 55 years of age and older.

Table 5.19. *Proportion (%) of those with limited work ability among the employed, according to independence at work and opportunities to improve oneself at work.*

Work characteristic	Proportion (%) with limited work ability 30–44	45–54	55–64	30–64[2]	OR[1] 30–64[2]	*Prevalence of work characteristic (%) 30–64[2]*
Able to influence one's own work						
Women						
Agree or have no opinion	3	9	20	7	1.0	*83*
Disagree	10	15	24	14	2.1***	
Men						
Agree or have no opinion	3	10	15	7	1.0	*88*
Disagree	9	18	25	15	2.4***	
Able to make independent decisions						
Women						
Agree or have no opinion	3	9	19	8	1.0	*84*
Disagree	8	15	30	14	1.9**	
Men						
Agree or have no opinion	3	10	14	7	1.0	*91*
Disagree	11	14	40	16	2.6***	
Able to improve special skills						
Women						
Agree or have no opinion	3	10	20	8	1.0	*79*
Disagree	7	12	24	11	1.5*	
Men						
Agree or have no opinion	4	9	12	7	1.0	*84*
Disagree	6	17	32	14	2.2***	
Work requires many new things to be learned						
Women						
Agree or have no opinion	4	9	19	8	1.0	*93*
Disagree	6	18	53	16	2.3***	
Men						
Agree or have no opinion	3	10	16	8	1.0	*93*
Disagree	11	17	17	15	2.1**	

[1] The odds ratio (OR) depicts the prevalence of limited work ability among those whose work was not independent or did not give opportunities to improve oneself in comparison with the corresponding prevalence of those whose work included these factors. Statistical significance of the difference: *p<0.05, **p<0.01, ***p<0.001.

[2] Age adjustment was based on a model including gender and age as explanatory variables, and the figures for women and men are therefore comparable. There were 1,948–1,949 women and 1,864–1,871 men in the analysis, depending on the indicator.

Table 5.20. *Proportion (%) of those with limited work ability among the employed, according the perceived support.*

Work characteristic	Proportion (%) with limited work ability 30–44	45–54	55–64	30–64 [2]	OR[1] 30–64[2]	*Prevalence of work characteristic (%) 30–64[2]*
Satisfied with respect from supervisor						
Women						
Agree or have no opinion	4	10	20	8	1.0	*82*
Disagree	4	10	23	9	1.1	
Men						
Agree or have no opinion	3	10	14	7	1.0	*83*
Disagree	8	14	23	12	1.8**	
Support from fellow workers when needed						
Women						
Agree or have no opinion	4	9	18	8	1.0	*93*
Disagree	12	23	39	20	3.3***	
Men						
Agree or have no opinion	4	10	13	8	1.0	*93*
Disagree	2	10	33	11	1.4	
The work community dicusses goals						
Women						
Agree or have no opinion	4	8	19	8	1.0	*85*
Disagree	5	17	29	13	1.8**	
Men						
Agree or have no opinion	4	10	13	7	1.0	*85*
Disagree	5	13	34	12	1.8*	

[1] The odds ratio (OR) depicts the prevalence of limited work ability among those who lacked support or opportunities to discuss goals in comparison with the corresponding prevalence of those who received support and had opportunities to discuss goals. Statistical significance of the difference: *p<0.05, **p<0.01, ***p<0.001.
[2] Age adjustment was based on a model including gender and age as explanatory variables, and the figures for women and men are therefore comparable. There were 1,911–1,932 women and 1,822–1,854 men in the analysis, depending on the indicator.

5.5.4 Relation between work characteristics and work ability according to physical work load

As expected, physical demands were the most prevalent in heavy physical work. For example, every other worker in physically demanding jobs had to use poor work postures or do strenuous work with their hands more often than occasion-

ally. Only about every fifth worker with a physically light job had to use poor work postures, and these workers hardly ever had to do strenuous work with their hands. In both physically demanding and physically light jobs, if the work contained physically loading factors, the risk of limited work ability increased. For example, poor work postures were related to limited work ability among men in all types of jobs, whereas, among women, the same was true especially in physically light jobs (Table 5.21).

Table 5.21. *Proportion (%) of the employed 30-to 64-year-olds with limited work ability in physically light, rather light or demanding work, according to the physical and mental work strain.*

Physical and mental work strain	Women			Men		
	Light work	Fairly light work	Demanding work	Light work	Fairly light work	Demanding work
Poor work postures						
Never or occasionally	5	5	10	5	4	6
More often	11**	9	15	10*	12*	12*
Feels mentally drained by work						
Seldom	4	5	10	5	4	7
Monthly	8	7	15	8	12*	22***
Weekly	22***	16**	33***	15**	25***	27***

Statistical significance of the difference in work ability of the workers with more work strain compared to those with less strain: *p<0.05, **p<0.01, ***p<0.001.

Previously, in Section 4.5, we stated that mental strain was prevalent among both white- and blue-collar workers. The characteristics of mental strain that are described in this section were also about as prevalent regardless of the level of physical demands, and mental strain was related to poor work ability in all of the groups formed on the basis of physical work demands. For example, regardless of whether the work was physically light or more demanding, the workers who often felt mentally drained because of their work evaluated their work ability as being significantly poorer than did those who had such feelings seldom or never. The number of workers with limited work ability was especially large among those who had physically demanding jobs and also felt that their jobs were mentally stressful (Table 5.21).

5.5.5 Summary and conclusions

The work factors that were the most strongly associated with limited work ability included strain and exhaustion as a result of the physical and mental demands of work. These associations were especially strong close to retirement age and caused great differences in work ability. A lack of independence and minimal opportunities to develop in one's work were also related to limitations in work ability.

Of the physical demands of work, manual work that required strength especially decreased the work ability of women aged 55 to 64. This result corresponds to earlier data showing that, by the age of 55 years, the cardiovascular functional capacity of approximately two thirds of female workers does not meet the physical demands of the women's work (Ilmarinen et al. 1991a).

Some negative factors seemed to cause rapid deterioration in work ability to the point that the work ability of workers exposed to these factors was poorer than that of workers who were 10 years older but had not been exposed to the same factors. Such a strong association with limited work ability was caused by the physical demands of work, especially among men. Evidently the strain of physical work causes older men to retire on a disability pension. In addition to mental stress at work, the work ability of women close to retirement was limited by work that did not offer opportunities for self-improvement. Thus tight work schedules and monotonous work seemed to especially decrease the work ability of older women.

In his model, Karasek (1979) has stated that independent opportunities to make decisions and have a say in one's work are factors that promote health. Their relationship to health and work ability is well-known from the results of several earlier studies (Tuomi et al. 1997 and 2001).

The characteristics that described the work community and were positively related to work ability included respect from supervisors and support from colleagues. In an 11-year follow-up study (Tuomi et al. 1997), improvements in the attitudes of supervisors were shown to strongly predict improvement in work ability.

All in all, our results indicate that a great variety of work characteristics may affect work ability and its deterioration. In addition, the results show that the physical demands of work can also be related to limited work ability in physically lighter work and that, on the other hand, mental stress factors increase the risk of poor work ability in physically demanding work. Thus when actions are planned to promote work ability, it is important to take into consideration the prevalence of possible negative work characteristics in a very broad manner.

Jorma Seitsamo, Kaija Tuomi, Juhani Ilmarinen

6 Diversity of Work Ability and the Work Ability Index

In this part of the study, we determined the associations of the work ability index with health and functional capacity, expertise, values and attitudes, work, family, and the immediate or close community.

Health, functional capacity, and work characteristics were the most strongly related to the work ability index in all age groups. In the oldest age group, the most important factor after health and work was activity outside one's household, whereas, in the younger age groups, attitudes and the family's economic circumstances were important. The effect of mental strain and physical work demands on work ability increased with age. Work enthusiasm was related to work ability in the oldest age group, and enjoying one's work was associated with work ability in the youngest age group.

6.1 Introduction

The development of society and worklife sets growing demands for supporting work ability and enhancing the attraction of work. For successful guidance of this development, whether on the level of society, the work community or the individual, measurements are needed. The work ability index was developed in a follow-up study of ageing Finnish municipal workers (see Section 3.2; Tuomi et al. 2006). It is a measure of work ability that has been broadly applied both in occupational health services and in scientific studies, not only in Finland but also in other countries (Ilmarinen and Tuomi 2004).

In this part of the study, work ability was determined using the work ability index. Our goal was to form a versatile and holistic image of the core structures of work ability and to determine the dimensions of work ability and factors that explain it. We have defined the core structures of work ability as the characteristics related to work and individual resources. The core structures as well as the

family and the close community have been illustrated by a model using the form of a house (Section 2.2). The multidimensional model assumes work ability to be a balanced synthesis of individual resources and work. The synthesis may also be influenced by the immediate surroundings.

6.2 Material and methods

The analysis involved the respondents who had worked during the year preceding the survey and whose work ability index was measured comprehensively (n = 3,774).

The choice of the variables for work ability involved the following process:

- Firstly, single items from the series of questions were used to form combined variables that described broader concepts. The items were combined either by summing their scores or through the use of factor analyses.
- The next step was to test the relations of the different floors and the immediate surroundings of the work ability house to the work ability index through the use of structural equation models.
- In the third phase, the work ability index was analysed by regression models. We used these models to analyse the explanatory power (R-squared) of the variables in each core structure, the explanatory power of each core structure, and the explanatory power of all the core dimensions of the work ability model.

Choice of work ability dimensions through factor analyses

Factor analyses were carried out for one series of questions that described work attitudes, two series of questions on work and its contents, and one series of questions on leisure-time activities and hobbies. They were carried out using the maximum likelihood method and Varimax rotation. The factors were then used to form factor score variables.

Attitudes towards work and the way work is experienced were examined using the 16 questions that have been used to measure burnout at work (Finnish version of the Maslach Burnout Inventory). In this study, we did not examine burnout at work as such; instead with the help of a factor analysis, we attempted to find new dimensions of work ability. The factors were given the following names: 1) mental strain of work (e.g., I feel I am worn out by my job), 2) joy of

achievement (e.g., I feel excited when I achieve something in my job), 3) meaningfulness of work (e.g., I have started to question whether my work has any value), and 4) enthusiasm towards work (e.g., my interest towards my work has decreased since I started this job).

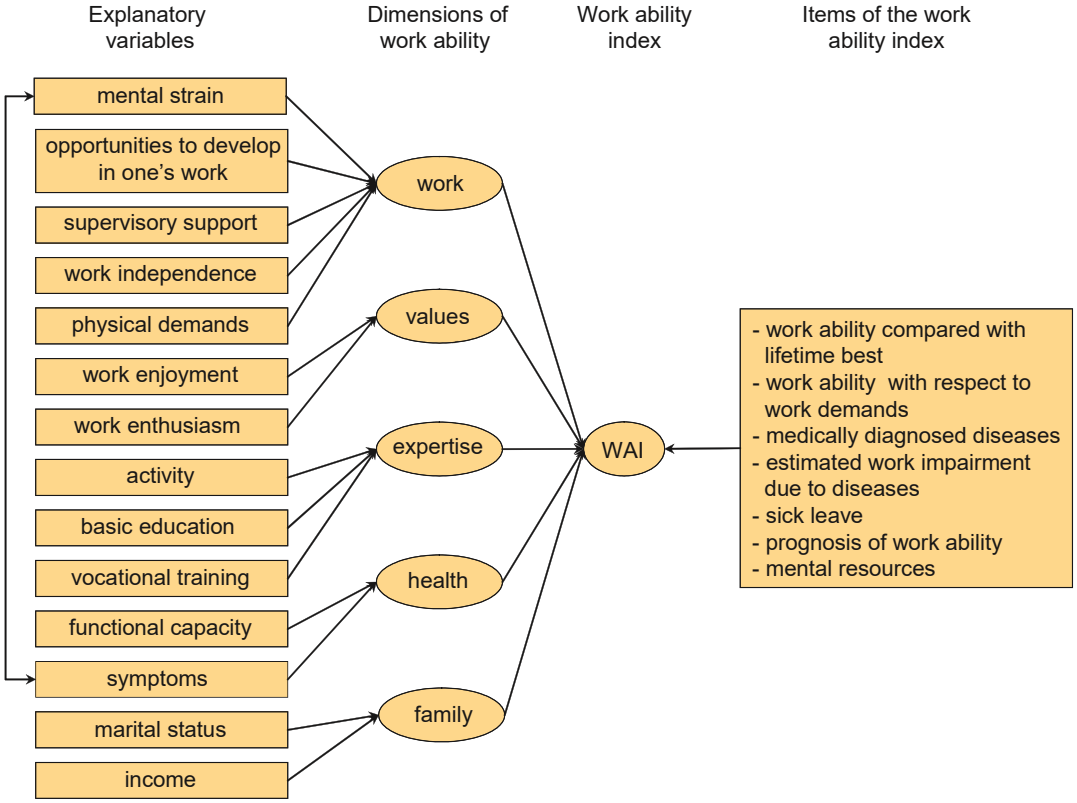
Altogether there were 24 questions on work characteristics and the work community, and they were all included in the final factor analysis. The variables were divided into five factors, which were given the following names: 1) opportunities for personal development at work (e.g., I am able to develop my special skills), 2) tight schedules at work (e.g., I have to meet tight schedules in my work), 3) supervisory support (e.g., I am satisfied with the respect I receive from my supervisor), 4) atmosphere of the work community (e.g., friendly and pleasant atmosphere), and 5) work independence (e.g., I have a lot of influence over my tasks).

In addition, fourteen questions on leisure-time activities and hobbies were included in the factor analysis; the variables formed four factors that were given the following names: 1) domestic activities (e.g., preparing food), 2) non-domestic activities (e.g., going to movies), 3) social activities (e.g., visiting), and 4) acting in social communities (e.g., club activities).

Structural equation models

The factor score variables along with other variables of the work ability model were included in the structural equation models. These models were used to construct a group of variables that would best explain the dimensions of work ability. The model that proved to be the best (Figure 6.1) was structured satisfactorily [root mean square error of approximation (RMSEA) = 0.059; Kaplan 2000] according to the different floors of the work ability house. Opportunities to develop in one's work, supervisory support, work independence, physical work demands, and the mental strain of work were strongly associated with the work floor of the work ability house. The joy of achievement at work and enthusiasm towards one's work affected the floor comprised of values and attitudes the most. Expertise was clearly based on education and adequate skills. The dimension of health was based on functional capacity and experienced symptoms. The dimension of family consisted of marital status, adequate income, and also hobbies. All of these dimensions together explained the work ability index and thus formed the multidimensional work ability model.

Figure 6.1. *Relations between the work ability index, the core structures of work ability, and the factors that explain them: structural equation model.*[1]



[1] The model helped determine which variables were grouped the best into the different dimensions of work ability, when the seven items of the work ability index were included in the model.
Source: Ilmarinen et al. 2005.

Comparison of means and regression analyses

Work ability was analysed by comparisons of means and linear regression analyses. Backward stepwise regression analyses were first carried out for each variable of the core structure so that the final models consisted only of statistically significant variables. Then the predictive power of each variable included in the core structure was calculated with separate regression models. Finally a model was constructed for the entire work ability house from all the variables remaining in the models of the core structures.

6.3 Results: associations of work ability with workers' resources, work and life outside work

Relations between the most important single variables and work ability

The effects of the explanatory factors were illustrated by comparing the mean values of the work ability index with the classes of the individual variables (Table 6.1). The individual variables were those that explained work ability in the previously mentioned structural equation models either individually or as an item of the sum or factor score variables.

Physical work demands, especially poor work postures, were strongly related to the work ability index in all of the age and gender groups. The *mental strain of work* was even more strongly related to work ability. If work was perceived as being very demanding at least once a week, the work ability index was statistically very significantly poorer than among those who had the same experience a few times a month at the most. *Being able to influence one's work* and to make independent decisions were related to good work ability among women of all ages and young men. *Respect from supervisors* was important especially for under-55-year-old workers. *Being able to develop one's skills* was important for the work ability of women in all age groups and under-55-year-old men.

Joy of achievement and weekly experiences of being good at what one does, the most important variables of the factor *work enjoyment*, were related to good work ability especially in the younger age groups (30- to 54-year-olds). *Low work enthusiasm* was statistically very significantly related to poor work ability in all of the age and gender groups.

The relation between basic education and work ability was strong in all of the age and gender groups in the area of *expertise*. The need for supplementary training was related to poor work ability especially in the younger age groups.

The variables *health* and *functional capacity* described the occurrence of mental and physical symptoms and the ability to perform everyday activities without difficulty. Mental symptoms were strongly related to work ability. The work ability of those who had had some experience with melancholia and depression was poorer than that of those who had less such experience.

Table 6.1. *Means of the work ability index according to the classes of the most important variables describing the dimensions of work ability.*[1]

	Mean of the work ability index					
	Women			Men		
	30–44 n=967	45–54 n=733	55–64 n=252	30–44 n=937	45–54 n=661	55–64 n=224
Poor work postures						
Never or occasionally	41.7***	39.7***	38.0***	42.2***	40.2***	38.5**
More often	40.0	37.3	33.3	40.4	37.6	35.8
Work feels very stressful						
Seldom	41.4***	39.6***	37.4***	42.0***	40.1***	38.5***
At least once a week	37.2	31.7	30.1	36.4	32.2	29.7
Able to influence one's work						
Agree	41.5*	39.4***	37.0*	42.1***	39.6	37.9
Disagree or no opinion	40.7	38.0	34.9	40.4	38.8	36.8
Satisfied with respect from supervisors						
Agree	41.6***	39.1**	36.7	42.3***	39.8	37.8
Disagree or no opinion	40.6	38.4	35.4	40.6	38.7	37.5
Able to develop one's special skills						
Agree	41.5*	39.5***	37.3*	42.1***	40.0***	38.1
Disagree or no opinion	40.8	38.2	35.2	41.0	38.5	37.0
Pleased with results attained at work						
At least once a week	41.5***	39.5***	36.8*	42.0***	39.8**	38.1
Seldom	39.7	36.1	34.2	37.9	38.1	36.5
No longer enthusiastic about work						
Seldom	41.5***	39.4***	37.2***	42.1***	40.2***	38.5**
At least once a week	39.4	35.4	32.5	38.9	35.6	34.3
Basic education						
High school graduate	41.8***	39.9***	38.4***	42.5***	40.8***	40.2***
Lower basic education	40.6	38.5	35.6	41.2	39.1	37.0
Skills and expertise						
Adequate skills for tasks	41.4***	39.1*	36.4	41.8**	39.6	38.1
In need of supplementary training	39.9	37.1	35.0	39.7	38.1	35.1
Melancholia, depression						
Not at all or only a little	41.9***	39.7***	37.1**	42.2***	40.2***	38.3**
Some or very much	38.3	35.2	33.1	37.8	35.6	32.6
Low-back pain						
Not at all or only a little	41.9***	40.4***	38.3***	42.6***	40.6***	39.3***
Some or very much	39.5	36.2	33.6	39.6	37.1	34.6
Carrying 5 kg for 100 m						
Without difficulty	41.4***	39.5***	37.0***	41.6	39.5***	37.8**
With difficulty or not able	34.1	31.5	31.7	44.8	26.5	30.3
Sufficiency of income						
Money sufficient for own needs	41.8***	39.9***	36.9*	42.3***	40.1***	38.7***
Must watch expenditures	40.3	37.0	35.0	40.4	37.8	34.9
Theatre, movies, other events						
At least once a month	41.6	39.9**	38.0**	42.3***	40.3**	40.7***
More seldom	41.1	38.6	35.6	41.3	39.1	36.5

[1] Statistical significance of the difference between the classes of each indicator: *p<0.05, **p<0.01, ***p<0.001.

Physical symptoms and pain also had a strong differential power. The work ability of those with at least some symptoms of low-back pain was poorer than that of those who had had less such experience. Difficulties carrying a 5-kilogram load was related to poor work ability among women of all ages and among men aged 45 years or older.

Income and non-domestic hobbies were examined as distinguishing characteristics of *the family and close community*. The work ability of those who had had to watch their consumption was poorer than that of those whose money was sufficient for their needs. A trip to the theatre, the movies, a concert, or other events at least once a month was related to good work ability.

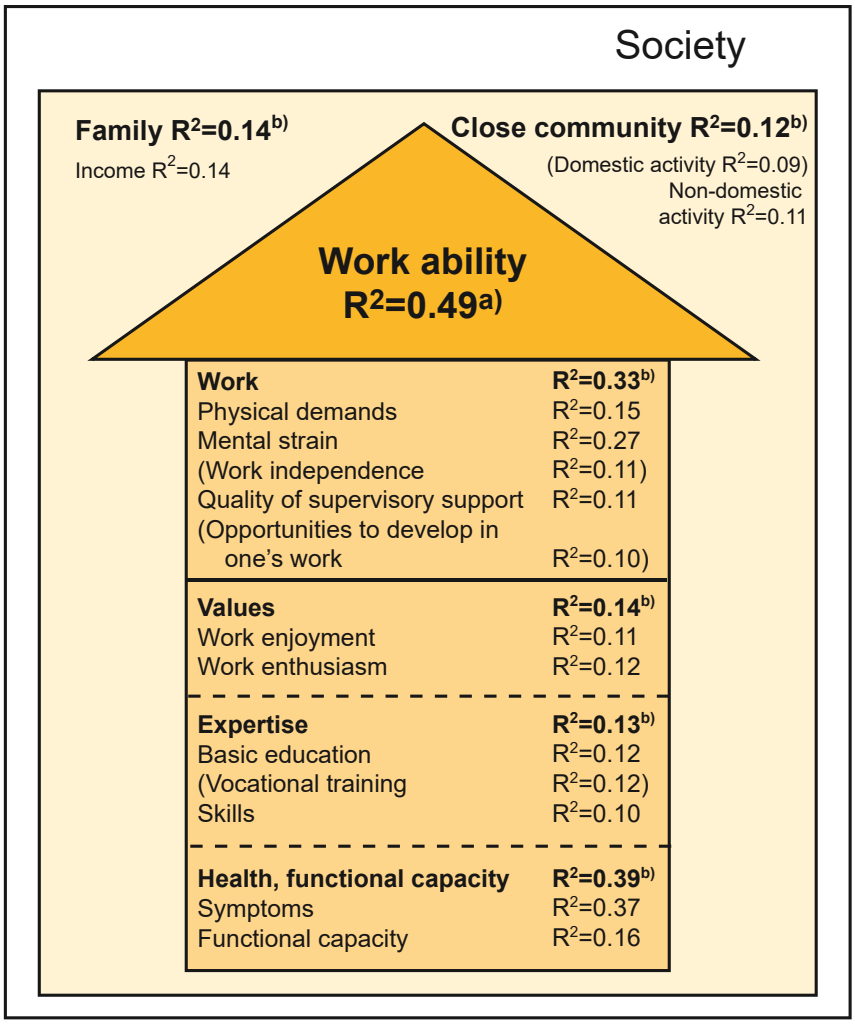
Regression models for the dimensions of work ability

Figure 6.2 presents the explanatory power of the regression models for workers aged 30 to 64. Health and functional capacity explained the different core structures the best, work was second best, and values and family were third. The explanatory power of expertise and the close community were the lowest.

The strongest explanatory power of the core structure describing work was the mental strain of work. Physical work demands also had a great effect. The explanatory power of supervisory support, work independence, and opportunities to develop in one's work were only slightly lower, but generally on the same level. Of these variables, the mental strain of work, physical work demands, and the quality of supervisory support were included in the model for the entire work ability house. Work independence and opportunities to develop in one's work, which are in parentheses in Figure 6.2, were excluded.

Work enjoyment and enthusiasm explained work ability in the core structure of *values, attitudes, and motivation*. The explanatory power of the two was about the same (i.e., 11–12 per cent). Their explanatory power for the combined model was slightly higher (14 per cent), but, nevertheless, both variables were retained in the work ability model including the entire work ability house.

Figure 6.2. *Explanatory power of the regression models (R^2) for the work ability index among 30- to 64-year-olds.*



a) Regression model for the entire work ability house.
b) Regression models for the different dimensions.
The variables that are in parentheses were excluded from the model used for the entire work ability house. All models were adjusted for age and gender. These factors explained 9 per cent of the total variance (R^2=0.09). There were 3,157–3,774 persons in the analysis.

The effect of *expertise* was examined by studying basic and vocational education and the existence of sufficient skills for one's job. These variables explained a little over 10 per cent of the variance. Basic education and the existence of sufficient skills for one's job were retained in the model for the entire work ability house.

In the core structure of *health and functional capacity*, the explanatory power of symptoms was much greater (37 per cent) than that of functional capacity (16 per cent). The symptom variable depicted the quantity of symptoms, whereas the functional capacity variable described the ability to perform everyday functions without difficulty. Both variables had an important explanatory role in the entire work ability model.

Both income and marital status were tested in the regression model that described *family*. Marital status did not explain work ability as an independent variable, but the sufficiency of income did.

The effect of *the close community* was described by domestic and non-domestic activities, as well as by social relations. Brisk leisure-time physical exercise was also included in this sector. Domestic and non-domestic activities were independently related to work ability, but only non-domestic activity (studying, travelling and visits to the theatre and restaurants) explained work ability in the model for the entire work ability house as well.

The model describing all of the core structures, family, and the close community explained 49 per cent of the variance in work ability (Figure 6.2). At least one variable was included from each core structure. Health and functional capacity, as well as work, had the strongest effect on work ability, but values, expertise, family, and the close community had an influence as well.

Regression models for the age groups

The models for the work ability house and its core structures explained the work ability of people close to retirement (55- to 64-year-olds) the best (Table 6.2). As much as 51 per cent of the variance in work ability was explained in this group. Health and work were the strongest explanatory factors in all three age groups. The explanatory power of the other factors were small, their order of importance differing in the age groups. Non-domestic activities (close community) had the strongest explanatory power after health and work in the oldest age group. In the two younger age groups, values (motivation) and family (income) were the strongest explanatory variables after work and health.

Table 6.2. *Explanatory power of the regression models (R^2) for the work ability index, according to age group.*

	Age group		
	30–44 R^2	45–54 R^2	55–64 R^2
Work ability	**0.39** [a)]	**0.48** [a)]	**0.51** [a)]
Work	**0.21** [b)]	**0.33** [b)]	**0.34** [b)]
Physical demands	0.06	0.08	0.09
Mental strain	0.15	0.25	0.26
Work independence	(0.03)	(0.03)	
Supervisory support	0.04	(0.03)	(0.04)
Opportunities to develop		(0.04)	(0.04)
Values	**0.07** [b)]	**0.08** [b)]	**0.07** [b)]
Work enjoyment	0.05	0.04	0.03
Work enthusiasm	0.03	0.05	0.06
Expertise	**(0.05)** [b)]	**(0.06)** [b)]	**(0.09)** [b)]
Basic education	(0.04)	(0.05)	(0.08)
Vocational training	(0.04)	(0.04)	(0.06)
Skills		(0.02)	
Health, functional capacity	**0.29** [b)]	**0.38**	**0.34** [b)]
Symptoms	0.27	0.35	0.33
Functional capacity	0.05	0.12	0.08
Family	**0.07** [b)]	**0.08** [b)]	**(0.05)** [b)]
Income	0.07	0.08	(0.05)
Close community	**0.02** [b)]	**0.06** [b)]	**0.10** [b)]
Non-domestic activity	(0.02)	(0.05)	0.10
Physical exercise		(0.03)	

a) Regression model for the entire work ability house.
b) Regression models for the different dimensions.
The variables that are in parentheses were excluded from the model used for the entire work ability house. All models were adjusted for age and gender. There were 1,700–1,704 persons in the analysis of the 30- to 44-year-olds, 1,151–1,397 of the 45- to 54-year-olds, and 394–475 of the 55- to 64-year-olds.

6.4 Summary and conclusions

In this part of the study, we examined the associations of the work ability index with health and functional capacity, expertise, values and attitudes, work, family, and the close community among 30- to 64-year-old Finnish workers in 2000. The results support the multidimensional model of work ability that is illustrated by the work ability house presented in Section 2.2 (Ilmarinen 2003; Ilmarinen et al. 2005). Significant explanatory factors for work ability were found in all of

the assumed core structures of work ability, both in the entire study population and in all three age groups.

The examined factors explained approximately one half of the variation in work ability that was measured by the work ability index. The core structures of health and functional capacity and work were the strongest explanatory factors in all three age groups. The fact that these core structures had a stronger effect than the structures of expertise and attitudes may be explained by the way the content of the items in the work ability index emphasizes health and work. The third item of the work ability index measures the quantity of medically diagnosed diseases, the fourth concerns the detrimental effect of diseases on work, and the fifth deals with the amount of sickness absence. The second item measures work ability from the point of view of physical and mental work demands. None of the items of the work ability index measure expertise or attitudes or their relation to work ability.

According to the regression models and the comparisons of the means, the relation between several factors and work ability seemed to grow stronger with age. This was the case in the areas of mental strain and physical work demands, which are both work variables. The same was true in the areas of education and activity. What was alarming was the strong increase in mental strain caused by work in the older age groups. This is a matter that should be actively considered at workplaces and dealt with through improvements in work schedules and work organization. Organizing short rest breaks sufficiently often may reduce fatigue caused by both physical and mental work demands. In addition, the contents of training and leisure-time activity among the ageing should also be taken into consideration.

The importance of skills and exercise was evident as well. Even though these factors did not remain in the regression models of the separate age groups the model of the entire study population and the comparisons of the means support the importance. In addition to not being part of the items included in the work ability index, the weak association of expertise with work ability may have been due to the fact that in people's minds work ability is related to health and coping rather than to expertise and performance.

As regards the regression models for values, it was interesting that the decrease in work enthusiasm more strongly explained work ability among the older workers than among the young ones. For younger workers work enjoyment was more important in explaining work ability. An explanation for the effect of ageing

on decreasing work enthusiasm, on one hand, and increasing work enjoyment on the other may be found in the periods of maintenance, stagnation, or growth observed in the middle stages of professional careers (at about 45 years of age) (Ruohotie 1991). The career development of some may slow down or stop. Also, for some, the middle stage of their professional career may provide opportunities for strong career growth, while others may enter a state of stagnation that leads to marginalization. Career opportunities created by the organization may explain the increase in work enjoyment, whereas decreases in work enthusiasm may be associated with reduced opportunities for advancement and early stages of marginalization that can be advanced by decreasing health.

Conclusions

According to our results, the promotion of work ability should include extensive activity that seeks improvements in all of the core structures of work ability. Even though the main results of the separate age groups were more or less similar, some differences were also found. For the older age groups, maintaining mental and physical resources and activity, as well as strengthening expertise, was important, whereas work motivation and sufficient income were important with respect to the work ability of younger people. It is important to keep in mind, however, that we used several different statistical methods in our attempt to determine the most important associations, and, because some explanatory variables were correlated, this process may have resulted in the omission of some issues that were essential for work ability (see, e.g., Hernberg 1992). Such issues could be, for example, hazards in the physical work environment. They were not retained in the structural equation model because they usually occurred in similar situations as physical work demands. We were able to establish that at least health, expertise, attitudes, work, family, and the close or immediate community are related to work ability. Many factors that were part of these core structures were also associated with work ability both independently and simultaneously with other factors. Although the work ability index should, indeed, be developed further as an indicator of work ability, the results of this study show that research on work ability should concentrate on finding essential factors through the use of different models. Studying separate associations involves the danger that an essential factor may go undetected because of interrelated correlations. Verifying cause–effect relationships will also require longitudinal studies.

As a recommendation, it should be pointed out that, from the standpoint of work ability in general, it is important that mental and physical work demands be suitable and that workers receive supervisory support in their work. Work should motivate and produce results and work enjoyment, while, at the same time, training and guidance should ensure the existence of required skills for the job. Already at a young age, physical functional capacity should be supported, and mental and physical symptoms should be dealt with and prevented. In addition, it would be worthwhile to direct attention to ways to ensure that families have sufficient income and ways to make possible activities that promote active physical and mental functioning in the close community. Cooperation and initiatives on the part of workers, occupational health services, and employers are desirable. Maintaining the work ability of workers will also continue to demand actions on the part of society.

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7 Unemployment and Work Ability

Unemployment, poverty, and a lack of education can be regarded as risks for marginalization. In our study, all three were related to limited work ability. Especially those who had been unemployed for a long period or repeatedly had poorer work ability than did those employed.

Re-employment was related to better work ability among the unemployed. The work ability of those who were re-employed was of the same level as that of other employees. The relation between unemployment and limited work ability was partly associated with a low level of education and economic problems.

7.1 Introduction

Long-term or repeated unemployment, poverty, and a low level of education are important risk factors for social marginalization (Townsend 1979). Poor health and functional capacity are also often mentioned as risk factors for marginalization (e.g., Percy-Smith 2000). These factors are related to the structures of society. Instead of using the macro-economic point of view in this chapter, we view marginalization as an individual process in which the possibilities for social groups or individuals to participate socially, economically, and politically in society slowly deteriorate. A progression of the marginalization process is a signal that problems exist in different areas of life control (e.g., Heikkilä 2000). Each risk or problem can increase the probability of marginalization, but no one risk or problem alone can be considered an indicator of marginalization.

Deteriorating work ability is associated with other aforementioned risk factors for marginalization. For example, unemployment is related to a perceived decrease in work ability (Koskinen et al. 2004). The association may partly be due to selection processes (i.e., persons with a poor work ability more often end up being unemployed). It is also possible that factors related to unemployment affect work ability negatively. The deterioration of expertise in the course of long-term unemployment may affect perceived work ability. A low basic level

of education can decrease the possibilities for people to update their skills or change occupations. And if unemployment is linked to economic difficulties, these difficulties can be reflected in decreasing work ability and physical health. Economic difficulties can also act as mediating or triggering factors for mental health problems and a decrease in self-esteem or mental well-being (Ervasti 2003). According to Lahelma (1989), unemployment decreases mental well-being. Unemployment can thus be reflected in work ability in many ways, either directly or through mediating mechanisms. Long-term unemployment or a fragmented work history and decreased work ability can fortify one another. In this chapter, we examine the relation of perceived work ability to unemployment, a low level of education, and poverty among 30- to 64-year-old men and women.

7.2 Work history and work ability

The following four groups were formed from the study population according to their work history: 1) *the employed*, workers who had not had periods of unemployment in the 5 years preceding the time of the interview, 2) *the re-employed*, workers who were working at the time of the interview but who had been unemployed at some time during the previous 5 years, 3) *the unemployed*, persons who were unemployed at the time of the interview, and 4) *those outside worklife*, those who were not in worklife at the time of the interview and who had been unemployed during the previous 5 years. The extent of unemployment was determined by the number of unemployment periods and the total length of unemployment as follows: 1) *the short-term unemployed*, those who had been unemployed no more than twice during the previous 5 years and whose total length of unemployment (also counting current unemployment) did not exceed 12 months, and 2) *the long-term unemployed*, those who had been unemployed at least three times in the previous 5 years or whose total length of unemployment (also counting current unemployment) exceeded 12 months.

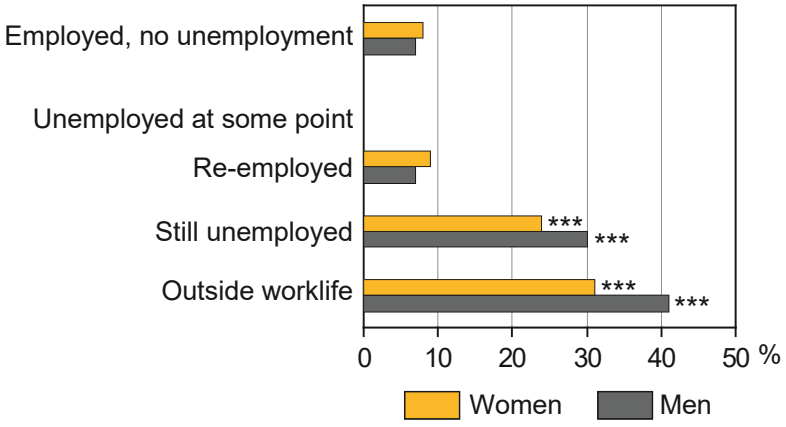
During the previous 5 years, 29 per cent of women and 25 per cent of men had been unemployed. Most of the unemployed (71 per cent) had experienced long-term unemployment. Of the workers who were employed at the time of the interview, nearly every fifth had been unemployed during the previous 5 years. Of these workers, a little over half had been unemployed long-term. Altogether 37 per cent of those who had been unemployed long-term were working at the

time of the interview. This percentage was clearly lower than that for the short-term unemployed (women 64 per cent and men 76 per cent).

Unemployment history

Over 90 per cent of those who were working at the time of the interview reported full work ability regardless of whether they had been unemployed previously (Figure 7.1). At the same time, a greater (three- to fourfold) proportion of those who were unemployed at the time of the interview perceived their work ability to be limited than did those who had been unemployed earlier but were working at the time of the interview. In the group of 30- to 44-year-old men, the proportion of those who reported limited work ability among the unemployed was eightfold greater than among the re-employed. The corresponding differences were smaller, however, in the two older age groups. In all three age groups, the work ability of those outside worklife was clearly poorer than that of the re-employed workers, and, in the 45- to 64-year age group, it was also poorer than that of the unemployed.

Figure 7.1. *Age-adjusted proportion (%) of those with limited work ability among 30- to 64-year-olds, according to employment status.*[1]



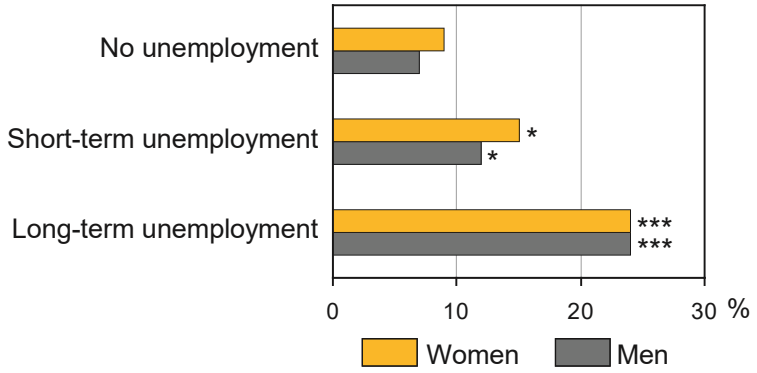
[1] Statistical significance of the difference between the "employed, no unemployment" group and the other groups: *p<0.05, **p<0.01, ***p<0.001.

The results were similar when we examined excellent work ability in place of limited work ability. The proportion of those who had given their work ability 9–10 points (i.e., had excellent work ability) was smallest among those unemployed or outside worklife and largest among those employed at the time of the interview, regardless of previous unemployment.

Extent of unemployment

The extent of unemployment (combined length of and number of unemployment periods) was related to work ability. The long-term unemployed rated their work ability as limited more often than did the short-time unemployed or those who had not experienced unemployment at all. There was also a statistically significant difference in the proportion of limited work ability between those who had had no unemployment and the short-term unemployed (Figure 7.2).

Figure 7.2. *Age-adjusted proportion (%) of those with limited work ability among 30- to 64-year-old workforce, according unemployment.*[1]



[1] Statistical significance of the difference between the "no unemployment" group and the other groups: *p<0.05, **p<0.01, ***p<0.001.

The proportion of those with limited work ability was the same among those re-employed as among those who had not been unemployed at all, regardless of the extent of previous unemployment. Also among people outside workforce, the proportion of limited work ability was similar for those who had been unemployed long-term and short-term.

7.3 Relation between work ability and education, economic difficulties and unemployment

Education

In Section 4.3, the educational level of the entire study population and those employed was found to be clearly related to work ability. Those with more education had better work ability than those with less education. The relation was also clear among 45- to 64-year-old unemployed men and women. However, the level of education was not related to work ability among the unemployed in the 30- to 44-year age group.

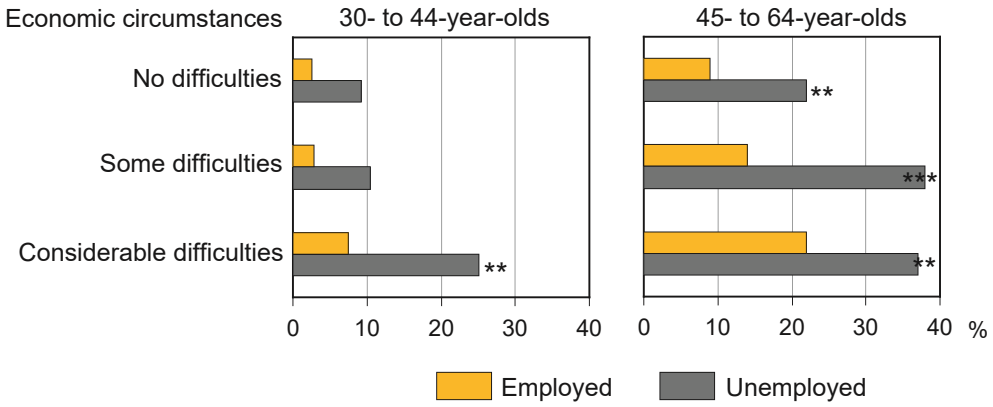
Economic difficulties

We divided the respondents who experienced economic hardships into two groups. The first group consisted of those who had to regulate their spending to some extent or who had trouble estimating the sufficiency of their money (some economic difficulties). The second group consisted of those who had to regulate their spending considerably or totally (considerable economic difficulties). The reference group consisted of those who stated that they had a sufficient or ample amount of money for their own needs.

A clearly larger proportion of those with considerable economic difficulties perceived their work ability to be limited than did those who had only some or no economic difficulties. Correspondingly, the proportion of those with excellent work ability decreased as the economic hardships increased.

The relation between economic difficulties and work ability was evident among both those employed and those unemployed (Figure 7.3). In the youngest age group, people with considerable economic difficulties perceived their work ability to be limited clearly more often than did those who had some or no economic difficulties. Among 45- to 64-year-olds, the work ability of also those who had some economic difficulties was more often limited than that of people with sufficient incomes.

Figure 7.3. *Proportion (%) of those with limited work ability among those employed and those unemployed, according to their economic circumstances.*[1, 2]



[1] Adjusted for age and gender.
[2] Statistical significance of the difference between those employed and those unemployed: *p<0.05, **p<0.01, ***p<0.001.

Education, economic difficulties and unemployment as explanatory factors of work ability

Table 7.1 presents the simultaneous effect of education and economic circumstances on limited work ability according to the length of unemployment. In both age groups those who had been unemployed long-term had a fourfold risk of limited work ability when compared with those who had not experienced unemployment. Short-term unemployment was not statistically significantly related to limited work ability in the younger age group. However, for those 45 years of age or older, even a short, less than 1 year, period of unemployment doubled the risk for limited work ability.

Table 7.1. *Odds ratios (OR)[1] for limited work ability according to the extent of unemployment and the effect of adjustment for education and economic difficulties.*

Age group and extent of unemployment	**Model 1** (adjusted for age and gender)	**Model 2** (adjusted for age, gender and education)	**Model 3** (adjusted for age, gender and economic circumstances)	**Model 4** (adjusted for age, gender, education and economic circumstances)
30–44 years				
No unemployment	1.00	1.00	1.00	1.00
Short-term unemployment	1.34	1.35	1.03	1.07
Long-term unemployment	4.44***	3.53***	2.91***	2.47***
45–64 years				
No unemployment	1.00	1.00	1.00	1.00
Short-term unemployment	2.08***	1.86**	1.82**	1.66*
Long-term unemployment	3.69***	3.11***	2.73***	2.38***

[1] The odds ratio (OR) depicts the prevalence of limited work ability among the unemployed in comparison with the corresponding prevalence of those who had not been unemployed. Statistical significance of the difference: *p<0.05, **p<0.01, ***p<0.001.

The odds ratio of limited work ability among the long-term unemployed decreased in both age groups by over 20 per cent after education was adjusted for. The effect of adjusting for economic difficulties was even greater, approximately 40 per cent. Perceived economic difficulties were also related to limited work ability among the short-term employed. In the group of 30- to 44-year-olds, altogether 60 per cent of the difference between the work ability of the long-term unemployed and those employed was related to a low educational level and poor economic circumstances. For those 45 years of age or older, the respective figure was over

40 per cent. Even after adjustment for age, gender, education, and economic difficulties, limited work ability was significantly more common among the long-term unemployed than among those who had not been unemployed at all. Among those 45 years of age or older, the same result was also found for short-term unemployment, as compared with no unemployment.

7.4 Summary and conclusions

Limited work ability was clearly more common among the unemployed than among those employed in our study. Work ability was also associated with the extent of unemployment (i.e., its length and its recurrence). The work ability of long-term or recurrently unemployed persons was clearly poorer than that of those employed or those who had been unemployed only rarely and for a short time.

An important result was that the work ability of those who had been unemployed but were employed at the time of the interview (the re-employed) was clearly better than that of those currently unemployed, and it did not differ significantly from the work ability of those who had not been unemployed at all during the same 5-year period. The extent of earlier unemployment did not affect the work ability of those re-employed. The proportion of the re-employed who were fully able to work was the same for both the long- and short-term unemployed in all three age groups.

Approximately one half of the difference between limited work ability among those with long-term unemployment and those employed could be explained by economic difficulties and poor education. A good education can be interpreted as being a protective factor against long-term unemployment. On the other hand, there was no evidence that a high level of education would be a resource in the case of unemployment. Economic difficulties can affect work ability, for example, through a decrease in self-esteem, mental strain, poor living conditions, or limited possibilities for health care. In the 45- to 64-year-old age group, limited work ability was as common among the unemployed with good economic circumstances as among those employed with considerable economic difficulties. In addition, for the unemployed in this age group, even slight economic difficulties were related to an increase in the proportion of people with limited work ability.

The Health 2000 Survey was cross-sectional, and therefore the study of causal relationships was not possible. We do not know if, for example, those

re-employed had a better work ability than that of other unemployed persons already before they were re-employed. Moreover, the perception of work ability may differ when work ability is assessed in a concrete work environment as opposed to a non-work environment.

The relation between unemployment and limited work ability was clear in this study population. It is likely that limited work ability can affect the number of unemployment periods and their length and thus partly explain the work ability distribution among the long-term unemployed. Those under 55 years of age who had been unemployed for less than 1 year did not perceive their work ability to be significantly different from that of employed persons of the same age. It is possible that in younger age groups unemployment results from attempts to change the life situation, for example, a search for a better job or a place in educational or training programs, whereas, for older working-age people, this is less often the case.

Part of the association between unemployment and limited work ability was clearly linked to economic difficulties, especially among the long-term unemployed.

If the found associations between unemployment and work ability, on one hand, and economic difficulties and work ability, on the other, are caused by the effect of unemployment and poverty on work ability, the risk of marginalization increases for the long-term unemployed as their work ability decreases. Therefore, the most important task of social policy would be to support the retention of work ability among the unemployed by promoting rapid re-employment into appropriate jobs. Our results can also be interpreted to mean that stable employment and stable economic circumstances affect work ability positively.

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8 Work Ability of Young Adults

The work ability of young adults was good. There were, nevertheless, great differences in work ability even among the young. One of the greatest risks for the work ability of young adults was unemployment and the lack of a basic level of education. According to the results, the maintenance of especially mental resources is important among young unemployed people with little education.

The work ability of working youth was related to health, physical fitness, perceived quality of life, and respect at work, among other things.

8.1 Introduction

The work ability and functional capacity of young people has not been studied to the same degree as that of older age groups. Even though the youngest age groups are healthier than others, one fourth of all 18- to 29-year-olds has a chronic illness, and one third rates their physical fitness to be average at best (Koskinen et al. 2005; Kestilä et al. 2006). Prolonged unemployment is known to decrease the functional capacity of even the young. A study on 25-year-old Finns showed that if unemployment lasts longer than 1 year, both mental and social functioning decrease strongly (Seitsamo et al. 1997).

According to the Finnish Youth and Work Barometer, the work ability score of 15- to 29-year-olds is 8.6 on a scale from 0 to 10 (Leino 2007; Sulander et al. 2007). Factors related to work and living habits, for example, have been found to affect the work ability of the young (Laitinen et al. 2005). According to a follow-up study of youth in northern Finland, especially passive and stressful work decreases mental work ability (Elovainio et al. 2007). Changing worklife and the increasing proportion of periodic and temporary jobs may also affect the work ability of young adults. In the jobs favoured by young people, especially

in information technology, tight and prolonged work schedules and overtime are typical (Nätti et al 2003) and can create pressure on work ability.

Thus the perceived work ability of young people is, in fact, related to their interpretation and idea of work. This point of view is central in the theory of dynamic work ability (Heikkilä 1996), in which work ability is considered to be a multilayered system that consists of individual characteristics, the relationship to work, the situation in society, and the demands set by the environment. It can be thought that, in today's uncertain employment situation, work ability is about maintaining meaning in life and the ability to tolerate insecurity in circumstances in which a lasting work career cannot be expected (Valkonen 1997; Aspvik 2003). It is, therefore, questionable whether the work ability measures that have been applied in older age groups are suitable for the study of young people.

Material

In this chapter, we examine the entire work ability index, as well as three of its items, as indicators of work ability. The three items are the work ability score (item 1), the number of medically diagnosed diseases (item 3), and mental resources (item 7). (See Section 3.2.) The use of the entire work ability index was limited to those employed at the time of the study.

We used the structural equation models that were presented in Section 6.2 to choose the factors that would represent the four floors of the work ability house. (See Section 2.2.) The factors were related to work and work demands, the way work is experienced, education, health and functional capacity, and quality of life. Three of the variables depicting the characteristics of work were based on factor scores for the mental strain of work, work independence, and opportunities to develop in one's work. The variable for the physical demands of work was formed as a sum score based on the responses to seven questions concerning lifting, carrying, poor work postures, working with hands above shoulder level, working on one's knees or squatting, strenuous work with hands, and repetitive hand movements. We also calculated a sum score for hazards in the work environment (noise, dust, vibration, chemicals, gases, tobacco smoke, coldness, heat, draught, and insufficient lighting). Two factor score variables, work enjoyment and work enthusiasm, represented the way work was experienced. The variables for education, physical fitness, satisfaction with one's own health, the appreciation one receives in the work community, and perceived quality of life were based on separate questions.

8.2 Work ability and employment status

The employment status of the young was divided into the following five groups: employed (60 per cent); students (21 per cent); unemployed (8 per cent); those at home (6 per cent), mostly homemakers; and others (4 per cent), mostly draftees. Three out of four of the young adults (with the exception of homemakers) did not yet have children. The educational level of the unemployed and those at home was poorer than that of the other groups. In addition, the homemakers had experienced more economic difficulties in their childhood home than the others had.

Work ability seemed to be related to education and economic background already among the young. Approximately 60 per cent of those with the best work ability had graduated from high school, and only a little over 40 per cent had graduated in the group with poorer work ability. The trend was similar when we evaluated the economic background of the childhood home. Four out of five persons in the group with the best work ability reported that there had been no economic difficulties in their childhood home, whereas only 57 per cent said the same in the group with poorer work ability.

The distributions of the work ability indicators presented in Chapter 3 show that young men perceived their work ability to be slightly better than young women did (Table 3.2). According to the work ability index, young men had excellent work ability more often than young women, and young men also gave their work ability a full score of 10 points more often than young women did. The difference between the genders occurred primarily between those with excellent and good work ability. There were as many men as women who perceived their work ability to be moderate or poor.

Students and employed young adults gave themselves the highest work ability scores (Table 8.1), and the work ability scores were rarely lower than 8 points in these groups. Fewer of the unemployed and those staying at home gave their work ability a full 10 points. The greatest range in the work ability score was found for the group “others”. About one half of this group gave their work ability 10 points, but almost one fifth gave themselves fewer than 8 points.

There were no notable differences in the number of medically diagnosed diseases according to employment status (Table 8.1), except that the unemployed and those at home had several diseases more often than the others. Approximately every fifth young adult had no diseases.

Table 8.1. *The work ability score, the number of medically diagnosed diseases, and the mental resources (%) of 18- to 29-year-olds, according to employment status.*[1]

	Employed	Studying	Unemployed	At home	Other	Total
Work ability score						
10	50	58	41	38	51	50
9	31	28	27	30	25	30
8	15	11	22	19	5	14
0–7	5	4	10	14	19	7
Total	100	100	100	100	100	100
Number of medically diagnosed diseases						
0	20	19	17	16	22	19
1	27	23	23	18	31	26
2	26	28	25	22	22	26
3	14	15	14	15	8	14
4 or more	14	16	21	29	17	16
Total	100	100	100	100	100	100
Mental resources[2]						
Good	44	43	28	34	40	42
Moderate	45	47	46	58	35	46
Poor	11	11	26	8	24	13
Total	100	100	100	100	100	100

[1] There were 1,273 (mental resources), 1,491 (work ability score), or 1,503 (number of diseases) 18- to 29-year-olds in the analysis.
[2] Item 7 of the work ability index: good resources = 4 points, moderate resources = 3 points, poor resources = 1–2 points.

The mental resources of young people varied according to employment status (Table 8.1). Those employed and students were in the best situation in that over 40 per cent of them had good mental resources. The situation was the worst among the unemployed. Only 28 per cent of unemployed young adults had good mental resources, and over one fourth had poor resources. Over one half of those at home had moderate mental resources.

8.3 Factors related to the work ability of young adults

The work ability of employed young adults, as well as that of all 18- to 29-year-olds, was explained by logistic regression analyses. Table 8.2 presents the final models. Among employed young adults, an excellent work ability index (44–49 points) was related to young age, male gender, good physical fitness, good perceived quality of life, satisfaction with one's health, and experiences of

appreciation at work. Poor basic education, high physical work demand, and the mental strain of work were related to a poorer work ability index (Table 8.2).

Table 8.2. *Factors that explained excellent work ability[1] among 18- to 29-year-olds in a logistic regression analysis.*

	OR[2]	
	Employed (n=768)	**All** (n=1,210)
Age		
26–29 years	1.0	1.0
22–25 years	1.2	1.5
18–21 years	1.9**	1.4
Gender		
Female	1.0	1.0
Male	2.0***	1.3
Basic education		
High school graduate	1.0	1.0
Less than high school	0.7	0.5***
Employment status		
Employed		1.0
Student		1.5
Unemployed		0.8
At home		0.7
Other		1.5
Joy in achievement		1.4***
Mental strain	0.7**	0.8*
Physical work demand	0.9***	
Appreciation at work		
Some at best	1.0	
Quite a lot	1.1	
Very much	1.8*	
Physical fitness		
Moderate at best	1.0	
Rather good	1.3	
Good	2.3**	
Satisfaction with one's health		
Moderately satisfied at best	1.0	1.0
Satisfied	2.1*	2.2**
Very satisfied	5.6***	4.2***
Perceived quality of life		
Moderate at best	1.0	1.0
Good	3.4**	3.9***
Excellent	3.6***	4.8***

[1] Excellent work ability was represented by a work ability index of 44–49 points for those employed and by a work ability score of 9–10 points for all young adults.
[2] The odds ratio (OR) depicts the prevalence of excellent work ability in comparison with the corresponding prevalence of the reference group, for which the OR was 1. Statistical significance of the difference: *p<0.05, **p<0.01, ***p<0.001.

When the work ability score of all young adults was examined, the results differed slightly from those of the employed young (Table 8.2). Among all 18- to 29-year-olds, good perceived quality of life, satisfaction with one's health, and joy in achievement at work, in studies or in other activities were related to an excellent work ability score (9–10 points). A low level of education and perceived mental strain at work, in studies, or in other main activities decreased work ability.

8.4 Summary and conclusions

The work ability of most young adults was good, but there were significant differences according to employment status. Especially the work ability of the unemployed and those who were at home was poorer than that of the others. This finding was especially evident with regard to mental resources. Maintaining the mental resources of young adults who are outside worklife should be given special attention. For example, in Finland, close to 70 per cent of those under 45 years of age who are on a disability pension have mental problems (Finnish Centre for Pensions and The Social Insurance Institution 2007a). The work ability of employed young adults seems to be related to their quality of life, appreciation at work, perceived health, and physical fitness. It is, therefore, evident that actions to support the work ability of young workers should be directed towards factors at the work community level and also towards maintaining health and physical fitness.

Even though the work ability of those at home was similar to that of the unemployed, homemakers had more mental resources to draw upon. The role of homemaker may be physically strenuous, but it seems to maintain the mental prerequisites for work ability.

The indicators of work ability are based on research on ageing workers, and there is no certainty that they are valid in evaluations of the work ability of young adults. Especially the work ability score is problematic because it measures work ability with respect to one's lifetime best, and the youngest persons do not have personal experience to use as a comparison. Nevertheless, young workers compare themselves with their different aged colleagues and possibly base their own evaluation on this comparison. Research that has used the work ability index or its items shows that the results obtained are consistent for young persons, however (e.g., Kujala et al. 2005 and 2006).

The great variation in the work ability of the different groups of young adults emphasizes the fact that the maintenance of work ability should be given sufficient attention already at a young age. A low level of education and unemployment seem to be the greatest risks to the work ability of the young. Correcting deficiencies in basic education and promoting and supporting attachment to work are the cornerstones to ensuring the work ability of the young. Actions that promote the work ability of the young should include an appreciation of their work input, the promotion of work enjoyment, and a division of tasks so that young workers do not experience too much mental stress. Taking care of one's health and functional capacity is also important.

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9 Work Ability in Late Career

The objective of lengthening work careers requires that older workers are sufficiently able to work. In this study, the work ability of workers aged 50 years or older was mostly good, but more than a quarter of the employed women aged 60 to 64 years considered their work ability to be limited.

When older workers listed things that negatively affected their survival in worklife, difficulties with the work community and mental strain were the most common. The oldest women, in particular, also had problems with health, motivation, and the physical demands of work.

Those who were about to retire still had adequate work ability. According to their own work ability assessments, approximately one third of all 63- to 67-year-olds were able to work.

9.1 Introduction

The work ability of older employees has lately been the object of considerable societal interest. The aim of lengthening work careers has increased the significance of maintaining and promoting work ability. Continuing to work is an option for older employees only if they are willing and able to work and if suitable work is available.

According to results presented earlier in this book, older people have more work ability limitations than younger people. Nevertheless, ageing does not necessarily mean an automatic decrease in work ability. A follow-up study in the Finnish municipal sector indicated that the work ability of approximately half of the older participants remained the same after more than 10 years, whereas it decreased for a third of the participants and increased for a tenth. The differences in work ability between individuals grew significantly with ageing, however. The work ability estimates of younger workers were mainly good or

excellent, whereas the estimates of older workers covered the whole range of the scale (Tuomi 1997).

Because chronic illnesses become more prevalent with growing age, morbidity explains the decrease in work ability among older employees to some extent. In Section 5.1, the perceived work ability of those with no chronic diseases was also shown to deteriorate. In these cases, fatigue or feebleness, changes at work, or selective labour market practices could have been responsible. (See Ilmarinen 1999; Gould 2001; Virtanen et al. 2005; Vahtera et al. 2005.)

In this chapter, we describe the work ability of 50- to 64-year-olds and, to some extent, the work ability of those 65 years of age or older from the point of view of continuing to work. We examine, for example, what are the greatest obstacles to older persons surviving in worklife, do people with limited work ability consider early retirement more often than others, and does the work ability potential of older employees suffice to lengthen their work careers? Of special interest are the differences in the work ability of women and men. We take into consideration the result presented earlier in this book (Section 4.1), namely, that the oldest employed women have poor work ability.

9.2 Work ability of late-career women and men

According to the work ability estimate, the work ability of employed women deteriorated with age even at the end of their careers. The estimates of men aged 50 years or older showed no differences between their age groups, however. The situation seems to be the same also according to the other indicators of work ability: the work ability index, the work ability score, and the work ability from the point of view of the physical demands of work (Table 9.1). The only exception was the work ability from the point of view of the mental demands of work, for which 50- to 64-year-old women had no statistically significant differences according to age. The only statistically significant difference according to age among 50- to 64-year-old men was found in the work ability score. Older men estimated their work ability to have decreased from their maximum ability more than slightly younger men had.

Table 9.1. *Work ability by age group among employed 50- to 64-year-olds, according to different indicators.*

Gender and age	Work ability estimate: those with limited work ability (%)	Work ability from the point of view of physical demands: those with very good work ability (%)	Work ability from the point of view of mental demands: those with very good work ability (%)	Mean work ability score	Mean work ability index
Women					
50–54 years	9	31	29	8.4	38.5
55–59 years	5*	29	29	8.1**	37.0**
60–64 years	27***	17*	23	7.8***	35.4***
Men					
50–54 years	12	39	37	8.2	39.2
55–59 years	11	37	36	8.1	38.4
60–64 years	10	28	29	7.8*	38.6

Statistical significance of the difference between the 50- to 54-year-olds and the other age groups: *p<0.05, **p<0.01, ***p<0.001.

The work ability of the oldest working-age women was exceptionally poor, especially with regard to physical work demands. According to the results presented earlier, a low educational level, heavy physical work demands, and chronic illness are related to poor work ability. These factors were emphasized among the oldest employed women. The level of education of 60- to 64-year-old women was clearly lower than that of women 10 years younger, whereas the respective difference among men was significantly smaller. Much of the work of the oldest women was physically demanding. The proportion of physically demanding work among men decreased when they reached the age group of 60 years or older, whereas for women, it increased. This trend could also be seen for the occupational structure. Among women, the proportion of managers and professionals decreased between the 50- to 54-year and the 60- to 64-year age groups, and the proportion of agricultural workers increased. Most of the older women worked in basic service occupations that were physically demanding. For men, the situation was reversed. The proportion of executives and experts was the largest among the oldest employed men, whereas the proportion of industrial workers decreased with age.

In addition to a low level of education and physically demanding work, the oldest employed women had many problems with health. For example, they had more chronic illnesses and more diseases that negatively affected their work than younger women or men of the same age (Figure 9.1).

Figure 9.1. *Proportion (%) of those with illnesses among employed 50- to 64-year-olds.*

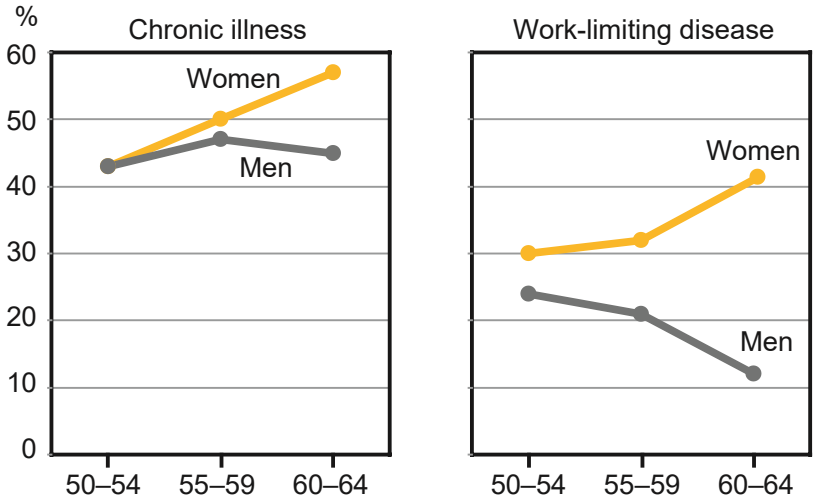


Table 9.2 illustrates how strongly education, physical work demands, and chronic illnesses were related to the differences in limited work ability in the different age groups among employed 50- to 64-year-olds. Model A in the table indicates that the risk of limited work ability among 60- to 64-year-old women was nearly fourfold when compared to that in the age group 50 to 54 years. Among men, there was no difference between the age groups. When all of the aforementioned factors were adjusted for – educational level, physical work demands, and chronic illnesses – the exceptionally high risk of limited work ability among the oldest women decreased by a third (Model E), but was still significantly higher than that of women who were 10 years younger. The men's situation did not change after the adjustments; there were no differences between the age groups.

Table 9.2. *Prevalence of limited work ability (OR[1]) according to age group and the effect of adjusting for educational level, physical work demands, and the prevalence of chronic diseases among employed 50- to 64-year-olds.*

Gender and age	Model A	Model B (adjusted for educational level)	Model C (adjusted for physical work demands)	Model D (adjusted for chronic diseases)	Model E (adjusted for educational level, physical work demands and chronic diseases)
Women					
50–54 years	1.0	1.0	1.0	1.0	1.0
55–59 years	1.8*	1.7	1.7	1.6	1.5
60–64 years	3.9***	3.4***	3.4***	3.6***	2.9**
Men					
50–54 years	1.0	1.0	1.0	1.0	1.0
55–59 years	0.9	0.9	1.0	0.8	0.9
60–64 years	0.9	0.9	1.1	0.8	1.0

[1] The odds ratio (OR) depicts the prevalence of limited work ability of employed 50- to 54-year-olds in comparison with the corresponding prevalence of the other age groups. Statistical significance of the difference: *p<0.05, **p<0.01, ***p<0.001. In total, 534 women and 573 men were included in the analysis.

9.3 Problems with surviving in worklife

In this section, we examine the problems that seem to hinder survival at work among older women and men.The problems that are examined here characterize the structures of the work ability house presented in Section 2.2. Problems with health, education, and work motivation depict the factors related to personal resources, whereas the factors related to work are divided into physical and mental aspects. We also examine external factors related to, for example, family or the immediate community that hinder coping at work.

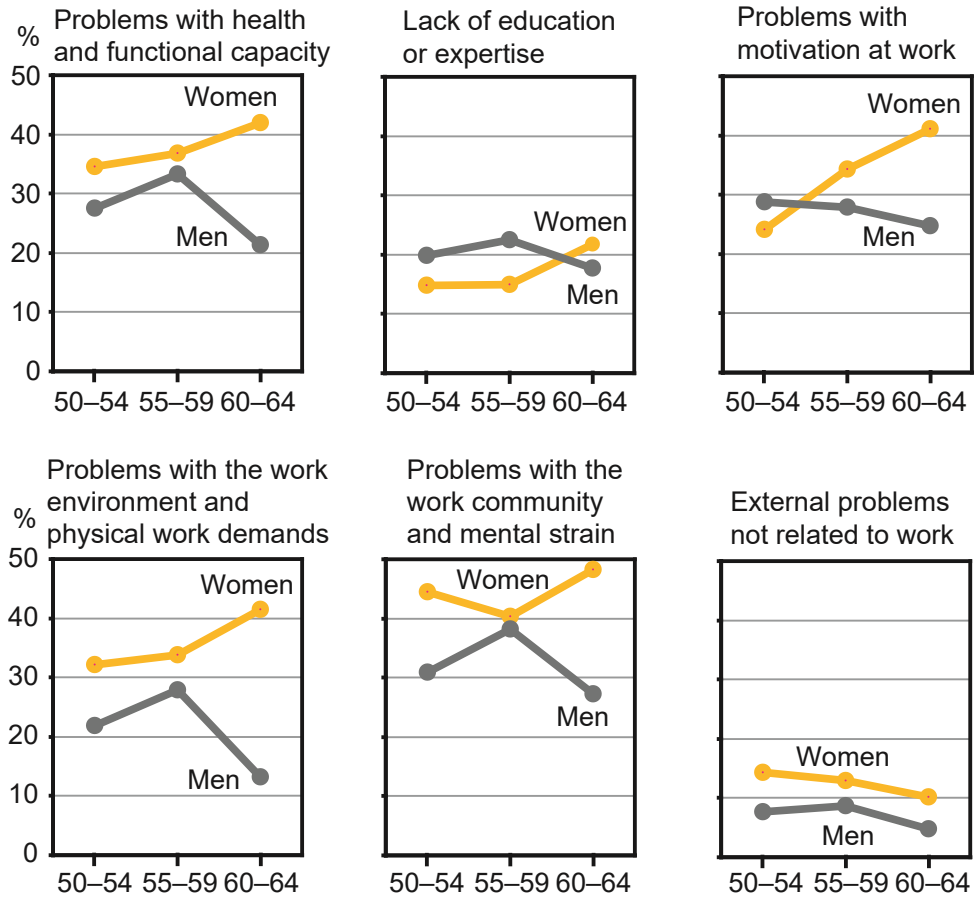
It is evident in Figure 9.2 that women experienced more problems across the board with respect to survival at work than men did. The only exceptions concerned a lack of education and expertise, where there was practically no difference between women and men.

The most common problem as regards surviving at work was related to the work community and mental strain (Figure 9.2). Almost half of all 60- to 64-year-old women reported that mental stress factors hindered their ability to cope with

work, whereas a quarter of men had the same experience. Physical demands and health problems at work also troubled the oldest employed women significantly more than men.

Problems with motivation also hindered the oldest women more often than the younger ones, whereas the situation was reversed for men. Men who continue to work close to old-age retirement are generally able to work and are motivated, as those with limited work ability have left work at an earlier age. Among women, the situation differed; many of those who continued to work after the age of 60 had difficulties coping at work.

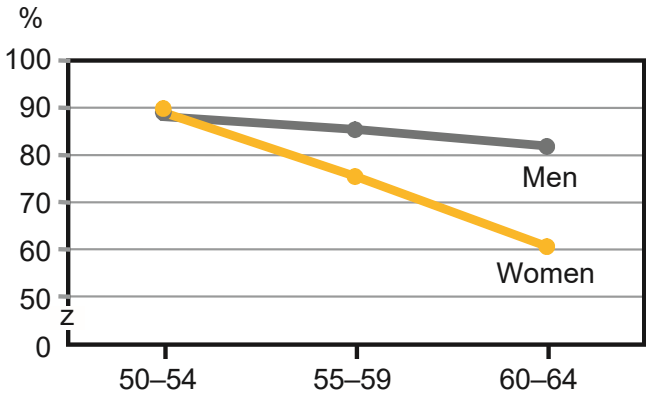
Figure 9.2. *Proportion (%) of those who had problems with survival at work among employed 50- to 64-year-olds.*



9.4 Continuing to work for two additional years

The estimates about whether a person's health will allow him or her to continue to work for a further two years also supported the result on the poor work ability of the oldest employed women. Again, there were no significant differences between men in the different age groups. Nearly 90 per cent of 50- to 54-year-old men and over 80 per cent of those 60 years of age or older believed they would be able to continue to work in the future. Among women, the situation differed. Most 50- to 54-year-old women thought they would survive in worklife, but only approximately 60 per cent of those aged 60 to 64 years believed that their health would allow them to work for two more years. (Figure 9.3.)

Figure 9.3. *Proportion (%) of those who believed their health would allow them to continue to work in their current job for 2 more years among employed 50- to 64-year-olds.*



The question on future ability to survive in worklife emphasized the role of health, and it is clear therefore that the perceived health of the respondents affected the estimates. Among employed 50- to 64-year-olds, over 90 per cent of those with good or rather good health believed they would survive in worklife for two more years, whereas only 63 per cent of women and 71 per cent of men with poor or average health were of the same opinion.

In addition, we also examined whether work, too, affects the estimations of future ability to survive in worklife. In Table 9.3, work is characterized by three factors, physical work demands, the reasonability of the workload and the uncertainty of work i.e., threats that the work or tasks will end or that there will be lay-offs. Those with good health and poor health have been analysed separately.

Table 9.3. *Age adjusted[1] proportion (%) of those who believed in their ability to stay in their current job for 2 more years (survivors at work) among employed 50- to 64-year-olds, according to the strain and insecurity of their job.*

	Women				Men			
	Poor health		Good health		Poor health		Good health	
Job strain and insecurity	Survivors at work (%)	OR[2]	Survivors at work (%)	OR[2]	Survivors at work (%)	OR[2]	Survivors at work (%)	OR[2]
Physical work demands								
Demanding	44	1.0	86	1.0	56	1.0	94	1.0
Fairly light or light	75	4.3***	93	2.1*	82	3.6***	96	1.3
Work load								
Reasonable	55	1.0	87	1.0	62	1.0	94	1.0
Unreasonable	79	3.5***	94	2.3*	84	3.2***	98	2.9
Job insecurity								
Many threats	31	1.0	75	1.0	48	1.0	83	1.0
Few threats	65	4.8***	91	3.9*	72	2.9*	97	5.9*

[1] Age adjustment was based on a model including health and age as explanatory variables, and the figures for those with good or poor health are therefore comparable.
[2] The odds ratio (OR) depicts the prevalence of survival at work in the future among those in lighter and more secure work in comparison with the corresponding prevalence of those in heavy and insecure work. Statistical significance of the difference: *p<0.05, **p<0.01, ***p<0.001.

Among those with poor health all of the studied work characteristics were strongly related to confidence in being able to work in the future. If health was poor and work was either stressful or insecure, there was little confidence in being able to continue to work for the next two years. On the other hand, if the work was light, the workload was reasonable, and there was no insecurity or uncertainties, even most of those with poor health believed that their health would allow them to work for at least another two years. Job strain or insecurity was not as important with respect to future survival at work among those in good health. In particular, men in good health believed their health would allow them to work in the future regardless of whether their work was heavy or light or whether the workload was reasonable or not. Among women, however, job strain also reduced the confidence of those who were healthy in regard to being able to continue to work. Likewise, insecurity at work was related to job performance among both women and men in good health. Even if workers were in good health, job insecurity made them doubt that their health would allow them to continue to work in the near future.

9.5 Work ability and thoughts of early retirement

Among employed 50- to 64-year-olds, a quarter of women and a third of men had often thought of taking early retirement. The oldest employed men, 60 years of age or older, had considered early retirement less often than those under 60. Apparently most men who had considered early retirement had acted on their thoughts before the age of 60. However, employed women aged 60 years or older considered taking early retirement more often than men of similar age and also more often than employed women who were under the age of 60 (Table 9.4).

Table 9.4. *Proportion (%) of those who had often considered early retirement among employed 50- to 64-year-olds.*[1]

	Age group			
	50–54 years	55–59 years	60–64 years	50–64 years[2]
Women	21	29	45	26
Men	31	35	27	32

[1] In total, 589 women and 558 men were included in the analysis.
[2] Age-adjusted.

Work ability was strongly associated with thoughts of early retirement among both women and men. Those who perceived their work ability to be poor considered taking early retirement more often than those with good work ability. However, there was a clear difference between women and men in relation to age. Figure 9.4 shows that poor work ability was related to women's thoughts of early retirement most clearly among 60- to 64-year-olds, whereas among men, the relation between work ability limitations and thoughts of early retirement was more common among 50- to 54-year-olds. Of employed 60- to 64-year-old women who perceived their work ability to be poor, three quarters had considered early retirement, whereas less than half of men with poor work ability in this age group had had similar thoughts (Figure 9.4). For the most part, the poor work ability of employed 60- to 64-year-old women and the strong association between work ability and thoughts of retirement in this age group explains the exceptionally high prevalence of thoughts of retirement in this group.

Figure 9.4. *Proportion (%) of those who had considered early retirement among employed 50- to 64-year-olds, according to work ability*.*

* Work ability index: 37–49 points = good work ability; 7–36 points = poor work ability.

9.6 Work ability and the lengthening of work careers

A reform of the Finnish earnings-related pension system was introduced in 2005 with a key aim being to postpone retirement. To reach this goal, early retirement was restricted, the retirement age was made flexible between 63 and 68 years of age and continuing longer in worklife was encouraged by an increase in pension accrual[1] (Hietaniemi and Ritola 2007). In this section, we examine whether workers aged 63 years or older seem to have sufficient work ability to postpone retirement and continue to work. Furthermore, we also outline the perceived work ability of old-age retirees until the age of 74 years.

Of the respondents aged 63 to 67 only 6 per cent of women and 9 per cent of men were employed at the time of our study. However, 40 per cent of this age group (including both the employed and not employed) estimated that they were or would be able to work. When we included the requirement that work ability be no less than 70 per cent of the lifetime best (i.e., work ability score of at least 7 points) into the criteria for being able to work, approximately one third of all 63- to 67-year-olds qualified as being able to perform in worklife. The results

1 Old-age pension can be taken without any reductions from the age of 63 years on. To encourage people to work longer, the pension accrual rate is 4.5 per cent for earnings after the age 63 and 1.9 per cent between the ages of 53 and 63 years. The normal accrual rate under the age of 53 years is 1.5 per cent.

indicate that people still have a relatively good level of work ability when they approach old-age retirement.

Nearly 40 per cent of 63- to 67-year-olds were receiving a disability pension at the time of the study or had been on a disability pension before old-age retirement. When we take into account the disability pension background, as well as the level of education, we get a more varied picture of the work ability of those on the brink of retirement. In Table 9.5, the 63- to 67-year-olds were divided into four groups according to their educational level and prior disability pensions. The data on disability pensions were obtained from pension registers. The proportion of people estimating that they were able to work is presented in each cell. As anticipated, the largest proportion of people able to work were found among those who had not been on a disability pension. Among this group, altogether two thirds of those with a higher level of education and nearly half of those with only a basic level of education believed that they were still able to work on the verge of old-age retirement. Of the people who had been on disability pension at some point in their career, one in ten estimated that he or she was still able to work.

Table 9.5. *Proportion (%) of those able to work[1] among 63- to 67-year-olds, according to the level of education and prior disability pension.[2, 3]*

Background on prior disability pensions	Educational level	
	Secondary or higher	Basic
Never on a disability pension	66***	45***
On or had been on a disability pension	13	10

[1] People who estimated that they were able to work according to the work ability estimate and who gave their work ability at least 7 points out of 10 in comparison with their lifetime best (work ability score).
[2] Adjusted for age and gender. A total of 459 people were included in the analysis.
[3] Statistical significance of the difference between the other groups and those with a basic education and disability pension: *p<0.05, **p<0.01, ***p<0.001.

In Table 9.6, we further examine the perceived work ability of old-age retirees aged 65 to 74 with no background of a disability pension. According to the results their perceived ability to work was related to both their physical and mental fitness, as well as to their ability to perform everyday tasks. Perceived work ability was most strongly related to mental well-being. Old-age retirees who were active, full of hope, and enjoyed everyday tasks also estimated their work ability to be good. A lively and positive frame of mind, in addition to good physical condition, seemed to support the preservation of work ability in retirement years.

Table 9.6. *Relation [odds ratio (OR)[1]] of physical fitness, performing daily tasks[2], and mental resources[3] to good work ability among 65- to 74-year-old pensioners without a background of a disability pension.[4]*

	Model A (adjusted for age, gender and educational level)	**Model B** (A + adjusted for physical fitness, performing daily chores, and mental resources)
Physical fitness		
poor	1.0	1.0
good	4.0***	2.2**
Performing daily chores		
poor	1.0	1.0
good	5.2***	3.6***
Mental resources		
poor	1.0	1.0
good	20.3***	12.1***

[1] The odds ratio (OR) depicts the prevalence of good work ability among those with good levels of physical fitness, ability to perform daily tasks, or mental resources in comparison with the corresponding prevalence of those with poor levels. Statistical significance of the difference: *p<0.05, **p<0.01, ***p<0.001.
[2] Ability to perform everyday chores, such as dressing and washing oneself, carrying a shopping bag, etc.
[3] Item 7 of the work ability index.
[4] A total of 446 people were included in the analysis.

9.7 Summary and conclusions

Many women aged 60 years or older consider their work ability to be poor

Our investigation of work ability in late career revealed exceptionally poor work ability among the oldest employed women. In comparison with younger women or men of the same age, 60- to 64-year-old women perceived their work ability to be poorer, they had more chronic diseases and diseases that impaired their work, and they also listed more other problems that hindered their ability of cope at work. Furthermore, older women perceived their work to be more often physically demanding than men did. Another study, on municipal employees in the city of Helsinki, has reported similar results (Aittomäki et al. 2005).

One explanation for the poor work ability of the oldest women could be their occupational structure. Vahtera and Pentti (1999) classified the occupational

groups of Finnish employees according to work demands and work control. They found occupations that place many demands on employees but offer few opportunities for them to control their work to be the most damaging to health. These included, for example, service and care work, which were typical occupations for women 60 years of age or older. The jobs of men in the same age group were also apt to have many demands, but unlike women, men had good control over their work.

According to our results, it seems that a health-related selection process from work is more evident among older men than among older women. Men who are not functionally fit transfer out of worklife, and those who remain are healthy and fit – for women the picture is not as clear. The difference between men and women may be explained by, for example, their health behaviour. Women suffer from symptoms, men break (Ahola 1992). The more distinct selection regarding health at the end of men's careers may therefore reflect a more radical model of behaviour (Kortteinen 1992). It may also be the case that the oldest employed women's perception of their work ability as poor indicates that it is more difficult to be an older woman than an older man in worklife. Women and men experience age differently (Julkunen 2003), and women are perceived to be older earlier in life than men (Pärnänen 2004). Individual differences in functional capacity grow with age, but, on average, the fitness of older women does not suffice for physical labour as well as men's (Ilmarinen et al. 1991a). The prevalence of burnout has also been found to grow with age among women, but not among men (Ahola et al. 2006). Moreover, the inordinate amount of limited work ability among the oldest women may be due to them finding it more difficult to transfer out of worklife than men do. Rejected disability pension applications, for example, are more common for women than for men (Gould 2003).

Emphasizing the problems older women have with work ability may, however, give too negative an image of how women survive in worklife. Even though it was true in our study that chronic diseases and perceived job stress were prevalent among women, half of all women aged 60 years or older were classified as having a good or excellent rating on the work ability index. Thus, although there are older women with poor work ability, there are women with long careers who do perceive their work ability to be good.

Uncertainty about work weakens confidence in the sufficiency of work ability

The work ability problems of older women were also reflected in their doubts as to whether their work ability was sufficient for staying at work. Of the women and men 60 years of age or older, 60 per cent and over 80 per cent respectively, believed their health would suffice for them to work for two more years. This belief was not, however, related only to the health or other resources of the worker – the work itself also mattered. Light, secure work with a reasonable workload helped workers believe that they could continue to work even though their health was poor. On the other hand, insecurity at work reduced the confidence of even the healthy in their ability to continue to perform at work.

The strong association between the uncertainty of work and being able to continue to work tells us something about the complexity of work ability. Workers evaluate their work ability according to the ongoing societal situation, and uncertainty about work and feelings of threat can, therefore, decrease the trust in being able to survive at work. The increased emphasis on uncertainty is also a sign of the employability dimension of work ability. People do not only feel that work ability is about work performance; they see it also as one of the factors needed in order to obtain work. Thus, uncertain employment opportunities may also decrease work ability.

Problems with work ability are reflected in intentions to take early retirement

Thoughts of early retirement were related to work ability. This was no surprise, as several earlier studies have reported similar results (e.g., Huuhtanen and Piispa 1999; Hopsu et al. 2005; Harkonmäki 2007). Again, the situation of women 60 years of age or older emerged also in this connection. Three out of four women of this age who perceived their work ability to be poor had contemplated taking early retirement, whereas among men the respective proportion was less than half.

The few thoughts of early retirement among the oldest employed men is a sign of good coping at work. On the other hand, the higher prevalence of thoughts of early retirement among younger, 50- to 59-year-old men, and the strong relation between these thoughts and perceived work ability emphasize the need to promote work ability in advance, before the age of early retirement.

People on the verge of retirement are still able to work

Work ability during one's career is a good indicator of work ability in retirement. Of the 63- to 67-year-olds who had no disability pension background and who had at least a secondary level of education, two out of three perceived themselves as able to work. A similar result was also found in a longitudinal study of municipal workers (Ilmarinen 2003). From the point of view of supporting the aged in continuing to work, it is evident that the best promotion of work ability among the oldest workers is to maintain work ability already in the earlier stages of their careers. Another important observation related to the work ability of those in retirement age was the strong relation between mental alertness and perceived work ability. Not only physical fitness, but also a positive frame of mind strengthens work ability in retirement age. All in all, the examination produced a positive picture of the work ability of 63- to 67-year-old workers who are on the verge of making their choice about when to retire. However, along with work ability, we need suitable tasks and work opportunities before the goals of lengthening careers can be reached.

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10 Has the Work Ability of the Population Improved?

Self-reported limitations in work ability among the working-age population decreased from the end of the 1970s to the beginning of the 2000s by approximately one fourth among women and approximately one third among men. This positive development was strongly related to changes in the population structure and, more specifically, to changes in the educational structure of the population during the observed period.

The prevalence of limited work ability did not change statistically significantly in any of the educational groups over a period of two decades, but the level of education of the population increased rapidly. Almost seven out of ten working-age persons had only a basic education at the end of the 1970s, whereas only three out of ten fell into this category at the beginning of the 2000s.

The increase in the work ability of working-age women was totally related to the fact that the proportion of people with the highest education, among whom limitations in work ability are the least common, increased in the population. Of the increase in work ability among men, almost one half was associated with an increase in the level of education.

The change in the educational structure was, however, closely related to other changes in worklife. We need further research to determine the degree to which the changes in education, and other related factors, explain the improvement in the work ability of the population.

10.1 Introduction

According to several indicators, the health and functional capacity of Finns have increased significantly during the last few decades. Life expectancy has increased, many diseases have become less common, and fewer and fewer people

have functional limitations (Koskinen et al. 2006). Work has changed, too. The proportion of agricultural and industrial work has decreased, while occupations in information technology and the service sector have increased (Pyöriä 2005; Kauppinen et al. 2007). Since the end of the 1970s, there has been hardly any change in the level of the physical work load, however, whereas mental work demands have increased, especially among women (Lehto and Sutela 2004). Improvements in the population's health have paved the way for an increase in work ability. However, changes in work have been much more multifaceted.

According to pension statistics, work disability has decreased since 1980. At the end of 2000, the age-adjusted prevalence of disability pensions was 10 per cent in the 30- to 64-year-old population, whereas in 1980 the corresponding prevalence was 13 per cent. This positive development was evident in all age groups (Table 10.1). The proportion of disability pensioners decreased more among men than among women, and the decline was particularly rapid among 45- to 54-year-olds. The change in the proportion of the population on a disability pension has been affected by many individual and social factors, as well as by factors related to the activities of enterprises (e.g. Hytti 1995; Gould 2003; Vahtera et al. 2005; Harkonmäki 2007).

Table 10.1. *Proportion (%) of disability pensioners among 30- to 64-year-olds in 1980 and 2000.*

Age group	Women			Men		
	1980[1]	2000	Relative change (%) 1980–2000	1980[1]	2000	Relative change (%) 1980–2000
30–44	3.2	2.7	15.6	4.1	3.4	17.1
45–54	10.3	7.8	24.3	13.7	9.3	32.1
55–64	29.4	24.3	17.3	37.5	27.2	27.5
30–64	11.7	9.5	18.8	14.7	10.6	27.9

[1] Age-adjusted with the 2000 population as the standard.
Source: Finnish Centre for Pensions and The Social Insurance Institution.

Few earlier data are available on the long-term changes in perceived work ability. In Finland, the work ability score of those employed has remained the same (Kauppinen et al. 2007) since the end of the 1990s, yet, in the public sector it has decreased slightly (Ylöstalo 2007).

Changes in work ability

In this chapter, we examine the changes that have taken place in the prevalence of limited work ability in the 30- to 64-year-old population. Our investigation is based on data from the Mini-Finland Survey that was conducted in 1978–1980 and from the Health 2000 Survey that was conducted in 2000–2001. The analysis included 93 per cent of the sample of the 30- to 64-year-olds in the Mini-Finland Survey and 88 per cent of the sample in the Health 2000 Survey. The proportion of non-respondents was small and the effect of non-response on the results was further diminished by the use of weights that took into account the composition of the group of non-respondents. The comparability of the results from these two materials is good due to the small non-response and similar sampling, content, and execution of the studies (Aromaa and Koskinen 2004).

In addition to the results concerning the entire 30- to 64-year-old population, this chapter describes time trends in the limitations of work ability in subgroups of the population. The proportions of people with limited work ability presented in this chapter differ somewhat from the figures presented in Chapter 4 because the age adjustment in this chapter has been carried out in a way that enables the results of the Mini-Finland Survey and the Health 2000 Survey to be compared.

10.2 Changes in work ability according to age, gender, region, education and marital status

Age and gender

The proportion of 30- to 64-year-olds who estimated their work ability to be limited decreased significantly from the end of the 1970s to the beginning of the 2000s (Table 10.2). The change was slightly steeper for men than for women. As a consequence, the gender difference in the prevalence of limited work ability almost disappeared. When the age groups are studied more closely, it becomes obvious that the development was clearly positive only for women aged 45 to 54 and men aged 45 to 64. As was mentioned in the introduction, the proportion of disability pensioners in the population also decreased the most in these age groups during the study period (Table 10.1).

Table 10.2. *Proportion (%) of those with limited work ability, according to age and the time of the study.*

Age group	Women % Mini-Finland 1978–80	Women % Health 2000 2000–01	Women Change 2000–01/ 1978–80 (OR[2])	Men % Mini-Finland 1978–80	Men % Health 2000 2000–01	Men Change 2000–01/ 1978–80 (OR[2])
30–44	8	6	0.8	8	8	0.9
45–54	26	17	0.6***	29	20	0.6***
55–64	47	46	0.9	54	45	0.7***
30–64[1]	23	18	0.7***	24	19	0.7***
p (Interaction age × study)[3]			0.017			0.072

[1] The figures for women and men are not fully comparable because age adjustment was made for women and men separately.
[2] The odds ratio (OR) depicts the prevalence of limited work ability in 2000–2001 in comparison with the situation in 1978–1980. Statistical significance of the difference: *p<0.05, **p<0.01, ***<0.001.
[3] P-value for the statistical significance of the differences between age groups in the relative change in the prevalence of limited work ability.

Region

The same classification for regions was used as in Section 4.2. The work ability of women increased statistically significantly only in the urban municipalities in southern Finland and in the non-urban municipalities in eastern and northern Finland (Table 10.3). Among men, the limitations decreased in all regions, with the exception of the urban municipalities in western Finland.

Education

Education was classified into four categories on the basis of information from the interview. The classification is similar to that described in Section 4.3, with the modification that the secondary and higher vocational level were combined. The educational structure of the participants in the Health 2000 Survey was very different from that of the Mini-Finland Survey. The proportion of people with at least a secondary level of education in the latter study was approximately double that in the earlier study (Table 10.4).

Table 10.3. *Age-adjusted[1] proportion (%) of those with limited work ability among 30- to 64-year-olds, according to region and time of the study.*

	Women			Men		
	%		Change	%		Change
	Mini-Finland 1978–80	Health 2000 2000–01	2000–01/ 1978–80 (OR[2])	Mini-Finland 1978–80	Health 2000 2000–01	2000–01/ 1978–80 (OR[2])
Southern Finland						
Urban municipalities	19	14	0.7**	21	16	0.6*
Non-urban municipalities	20	21	1.1	24	15	0.5*
Western Finland						
Urban municipalities	20	20	1.0	17	19	1.1
Non-urban municipalities	23	20	0.8	25	19	0.6**
Eastern and Northern Finland						
Urban municipalities	26	20	0.7	29	20	0.5*
Non-urban municipalities	30	21	0.5*	32	23	0.6**
p (Interaction age × study)[3]			0.173			0.006

[1] The figures for women and men are not fully comparable because age adjustment was made for women and men separately.
[2] The odds ratio (OR) depicts the prevalence of limited work ability in 2000–2001 in comparison with the situation in 1978–1980. Statistical significance of the difference: *p<0.05, **p<0.01, ***p<0.001.
[3] P-value for the statistical significance of the differences between regions in the relative change in the prevalence of limited work ability.

Table 10.4. *Age-adjusted[1] educational structure (%) among 30- to 64-year-old women and men in the Mini-Finland Survey (1978–1980) and the Health 2000 Survey (2000–2001)[2].*

	Women		Men	
Educational level	Mini-Finland 1978–1980	Health 2000 2000–2001	Mini-Finland 1978–1980	Health 2000 2000–2001
Lower basic	40	10	38	14
Upper basic	29	19	29	17
Secondary or vocational	25	58	26	58
Academic	6	13	7	12
Total	100	100	100	100

[1] The figures for women and men are not fully comparable because age adjustment was made for women and men separately.
[2] The analysis included those with data on their perceived work ability: 2,944 (94% of the sample) women and 2,723 (93% of the sample) men in the Mini-Finland Survey and 2,692 (90% of the sample) women and 2,486 (86% of the sample) men in the Health 2000 Survey.

The steep differences in limited work ability between the educational levels remained from the end of the 1970s to the beginning of the 2000s. The proportion of people in the Health 2000 Survey who estimated their work ability to be limited was four times (men) or five times (women) higher among those who had a primary level of education than among those with an academic degree (Table 10.5). The prevalence of limitations in work ability did not decrease statistically significantly in any educational category. The improvement in the work ability of the entire population was thus strongly related to the change in the educational structure of the population. (See Section 10.3.)

Table 10.5. *Age-adjusted[1] proportion (%) of those with limited work ability among 30- to 64-year-olds, according to educational level and the time of the study.*

Educational level	Women			Men		
	%		Change	%		Change
	Mini-Finland 1978–80	Health 2000 2000–01	2000–01/ 1978–80 (OR[2])	Mini-Finland 1978–80	Health 2000 2000–01	2000–01/ 1978–80 (OR[2])
Lower basic	29	34	1.3	31	28	0.9
Upper basic	19	20	1.1	23	23	1.0
Secondary or vocational	17	16	0.9	18	16	0.8
Academic	10	7	0.8	4	8	1.8
p (Interaction age × study)[3]			0.319			0.408

[1] The figures for women and men are not fully comparable because age adjustment was made for women and men separately.
[2] The odds ratio (OR) depicts the prevalence of those with limited work ability in 2000–2001 in comparison with the situation in 1978–1980. Statistical significance of the difference: *p<0.05, **p<0.01, ***p<0.001.
[3] P-value for the statistical significance of the differences between the educational groups in the relative change in the prevalence of limited work ability.

Marital status

The proportion of married people was smaller, and the proportion of people cohabitating or divorced was clearly greater at the beginning of the 2000s than at the end of the 1970s (Table 10.6). The proportion of widows decreased during the same 20-year period, and the proportion of single women and men increased somewhat.

Table 10.6. *Age-adjusted[1] marital status structure (%) of 30- to 64-year-old women and men in the Mini-Finland Survey (1978–1980) and the Health 2000 Survey (2000–2001)[2].*

Marital status	Women		Men	
	Mini-Finland 1978–1980	Health 2000 2000–2001	Mini-Finland 1978–1980	Health 2000 2000–2001
Married	74	60	80	59
Cohabitating	2	13	3	15
Divorced	7	12	4	9
Widowed	8	3	1	1
Single	9	11	12	16
Total	100	100	100	100

[1] The figures for women and men are not fully comparable because age adjustment was made for women and men separately.
[2] The analysis included those with data on their perceived work ability: 2,965 (94% of the sample) women and 2,734 (93% of the sample) men in the Mini-Finland Survey and 2,693 (90% of the sample) women and 2,487 (86% of the sample) men in the Health 2000 Survey.

The work ability limitations decreased significantly only among those living in a relationship or divorced (Table 10.7). Among women, the direction of the change even varied according to marital status, the work ability of widows showing a statistically significant decrease.

Table 10.7. *Age-adjusted[1] proportion (%) of those with limited work ability among 30- to 64-year-olds, according to marital status and the time of the study.*

Marital status	Women			Men		
	%		Change	%		Change
	Mini-Finland 1978–80	Health 2000 2000–01	2000–01/ 1978–80 (OR[2])	Mini-Finland 1978–80	Health 2000 2000–01	2000–01/ 1978–80 (OR[2])
Married	22	17	0.7***	22	15	0.6***
Cohabitating	37	20	0.4**	33	17	0.3**
Divorced	26	19	0.6*	36	26	0.5*
Widowed	21	30	1.8*	26	17	0.5
Single	25	22	0.8	37	33	0.8
p (Interaction age × study)[3]			0.002			0.218

[1] The figures for women and men are not fully comparable because age adjustment was made for women and men separately.
[2] The odds ratio (OR) depicts the prevalence of those with limited work ability in 2000–2001 in comparison with the situation in 1978–1980. Statistical significance of the difference: *p<0.05, **p<0.01, ***p<0.001.
[3] P-value for the statistical significance of the differences between the marital status groups in the relative change in the prevalence of limited work ability.

10.3 Are the improvements in the work ability of the population a result of changes in the population structure?

In the previous sections, it was shown that the proportion of those 30 to 64 years of age who estimated their work ability as limited decreased over the two decades in question among both women and men. The positive development of work ability concerned especially those aged 45 to 54 and, among men, also the 55- to 64-year-olds. It was also shown that there were differences in work ability according to educational level and marital status. The distribution of the population according to these factors changed a great deal over the two decades. The general level of education increased, and cohabitation and divorce became more prevalent (Koskinen et al. 2006). It is, therefore, possible that the improvement in work ability was due to a change in the structure of the population. Therefore, with the aid of a logistic regression model, we examined how adjusting for these changes in the population structure affected the change in the proportion of those with limited work ability.

The first column (Model 0) of Table 10.8 presents the same results concerning the change in the limitations of work ability that were presented previously in Table 10.2, with the exception that here the results for the broad age groups were also age-adjusted. Adjusting for region in addition to age (Model 1a), yielded results that were identical to the age-adjusted results obtained in Model 0. Thus, taking into account the changes in the regional structure of the population does not change our conception of the development of work ability from the end of the 1970s to the beginning of the 2000s.

When marital status was adjusted for in addition to age (Model 1c), work ability limitations seemed to decrease even slightly more rapidly than according to the age-adjusted results. This difference is due to the fact that the proportion of married people decreased in the population. Since work ability was better among married people than among those in the other marital status groups, the change in the marital status structure decreased the average work ability of the population.

The effect of adjusting for region (Model 1a) and marital status (Model 1c) was, nevertheless, small when compared with the effect of adjusting for the educational structure of the population (Model 1b). The improvement in women's work ability from the end of the 1970s to the beginning of the 2000s seems to have been entirely related to improvements in education.

Among men, the prevalence of limited work ability seems to have decreased slightly even when educational structure was adjusted for, except among those 30 to 44 years of age. The change in the prevalence of limited work ability among men from the end of the 1970s to the beginning of the 2000s was not, however, statistically significant when the effect of the increasing level of education was taken into consideration (Table 10.8).

Table 10.8. *Change from the period 1978-1980 to the period 2000-2001 (odds ratio[1]) in the proportion of those with limited work ability.*

	Model 0 (age-adjusted)	**Model 1a** (0 + region)	**Model 1b** (0 + education)	**Model 1c** (0 + marital status)	**Model 2** (1a + education)	**Model 3** (2 + marital status)
Women						
30–44	0.7	0.7	1.3	0.7*	1.3	1.1
45–54	0.6***	0.6***	0.8	0.5***	0.8	0.7
55–64	0.9	0.9	1.3*	0.9	1.3*	1.3
30–64	0.7***	0.7***	1.1	0.7***	1.1	1.0
Men						
30–44	0.8	0.8	1.4	– [2]	1.4	– [2]
45–54	0.6***	0.6***	0.8	0.5***	0.8	0.7**
55–64	0.7**	0.7**	0.9	0.7**	0.9	0.8
30–64	0.7***	0.7***	0.9	0.6***	0.9	0.8**

[1] The odds ratio depicts the prevalence of those with limited work ability in 2000 to 2001 in comparison with the situation in 1978 to 1980. Statistical significance of the difference: *p<0.05, **p<0.01, ***p<0.001.
[2] The model could not be estimated because of the small number of young widowers.

All of the previously examined structural factors were adjusted for in Model 2. For women, the changes in work ability were similar to those found in Model 1b. The prevalence of limited work ability did not change statistically significantly in any of the age groups among women after the effects of changes in the population structure according to age, region, educational level, and marital status were removed. Among men the changes in the population structure according to educational level and marital status had opposite effects, and, when both changes were adjusted for in Model 2, the prevalence of limited work ability among men decreased statistically significantly even though the positive shift was not nearly as steep as that attained with the merely age-adjusted results (Model 0).

These observations do not negate our conclusion, based on the age-adjusted results, that in the working-age population, especially among women aged 45 to 54 and men aged 45 to 64, work ability improved significantly over the two decades of study. On the other hand, the adjustment for population structure showed

that the improvement in women's work ability was entirely related to the fact that more women had continued their education beyond the primary level. The increase in men's work ability does not seem to be explained solely by factors related to the population structure.

10.4 Summary and conclusions

The educational structure of the population changed rapidly at the end of the 1900s. At the end of the 1970s, almost seven out of ten working-age persons had only a primary level of education, whereas at the beginning of the 2000s, only three out of ten belonged to this group. The improvement in the work ability of women was entirely related to this change in the educational structure, as was most of the increase in men's work ability as well.

The strong relation between education and work ability and the considerable effect of the adjustment for educational structure on changes in work ability may have been caused by many factors. It may be that a higher level of education promotes the preservation of work ability regardless of work tasks, for example, by making work and living habits healthier and by creating better prerequisites for people to use services that maintain work ability. On the other hand, it is obvious that the increase in the level of education that took place over the two decades reflects great changes in occupational structures and worklife. Office work has become more common, and a smaller part of the workforce holds jobs that are the most physically demanding (Koskinen et al. 2006; Kauppinen et al. 2007). This change has, in part, decreased the demands on people's physical work ability. The effects of changes in education that are apparent in the results of this chapter may well primarily reflect the way occupational structures and work tasks have become physically less demanding. On the other hand, other work demands have increased, and such increases may have been related to improved levels of education. Work tasks that require versatile expertise and that are mentally demanding have presumably become more common, and this change can be assumed to increase perceived limitations in work ability. The changes in educational and occupational structures and work tasks are closely linked, and it is not possible to separate the effect they have had on the results presented in this chapter.

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11 Dimensions of Work Ability – Summary and Conclusions

11.1 Summary of results

Personal resources and the context of work are the core structures of work ability

The core of work ability is the balance between personal resources and work characteristics. Many other factors, operating at differnet levels, are also related to work ability. Therefore, from the point of view of the concept of work ability and its measurement, it is essential that we recognize the significance of the multilevel factors for work ability and direct promotion towards the factors that can effectively enhance work ability.

The concept of work ability is a complex cultural and situational entity. The way in which young people understand work ability may differ from the way older people see it, and the way women evaluate work ability can differ from the way men assess it. Similarly, the way people with different kinds of jobs or employed people and people outside worklife consider work ability can be based on very different criteria.

Health is the resource of a worker that is the most clearly related to perceived work ability. Work ability is also strongly related to workers' attitudes towards work, whereas its association with expertise is not so strong. Mental and physical work demands are closely related to work ability. On the other hand, workers seldom interpret problems with the work community as being associated with their work ability. The role of expertise and work community factors are more evident in perceived work ability, however, if chronic diseases do not decrease work ability. The importance of diseases with respect to perceived work ability may thus be so decisive that only in their absence are other, more external factors associated with work ability.

Even among the healthy work ability decreases with age

Nearly all young adults perceive their work ability to be good, especially if they are employed or are students. The work ability of 18- to 29-year-olds who are

unemployed or are lacking in basic education is more limited, however. Mental problems play a big role in the decreased work ability of unemployed young adults.

Over 90 per cent of the 30- to 44-year-old population believe that they are fully able to work, whereas over half of those aged 60 to 64 years report that their work ability has deteriorated. Many factors related to limited work ability, such as poor health and a low level of education, are more common among the aged. Yet, these factors alone do not explain the association between work ability and age. The perceived work ability of the healthy and well-educated also decreases with age.

Health and work are the most important determinants of work ability among people of all ages. Of the two, health is more important than work among the young. Their problems with work ability are often related to a mental disorder or a physical disability. In the older age groups, infirmity, inability to cope, and job strain limit work ability more commonly. Despite the differences in emphasis, the dimensions of work ability are manifested rather similarly in the different age groups. In the promotion of work ability, it is, therefore, necessary to support all the dimensions of work ability during the different stages of a worker's career. For example, maintaining work enjoyment and work motivation among younger persons may promote the preservation of work ability also at the end of their careers.

The work ability of the oldest employed women is often poor

At the population level, we found no major differences between the perceived work ability of women and men. There is a distinct difference, however, among the oldest employed women and men. Employed women in the age range of 60–64 years evaluate their work ability as being clearly poorer than do men of the same age. Women in this age group experience more deterioration in work motivation and problems concerning the physical and mental work demands than men do. It is, therefore, a challenge for the lengthening of work careers to support the work ability of the oldest employed women in particular. On the other hand, the fact that men's thoughts of early retirement are common already closer to 50 years of age is a sign that supporting the ability to continue to work is important also well before retirement age.

Diseases decrease work ability – still those ill often consider their work ability to be good

People who regard their health as average perceive their work ability to be limited approximately six times more often than those who believe their health is good. In addition, almost all who perceive their health to be rather poor or poor consider themselves disabled for work. Many other observations presented in this book are also signs of the emphasis of health in work ability assessments.

Of the diseases investigated in our study, mental disorders and coronary heart disease, as well as osteoarthritis of the hip among men, decrease perceived work ability the most. The significance of a disease as a factor decreasing the work ability of the population is also dependent on its prevalence, however. If the prevalence is taken into consideration, depression, back and neck disorders, and hypertension decrease the work ability of the entire working-age population the most. Depression and back disorders decrease the work ability of those employed the most.

Even though many chronic diseases increase the risk of work disability considerably, many of those who are ill, especially those under 55 years of age, report that they are able to work. For example, approximately one half of those 44- to 54-year-olds who suffer from a mental disorder, coronary heart disease, or osteoarthritis of the supporting joints consider themselves able to work. Most of the younger people with these diseases and those of any age who report other diseases do not consider their work ability to be limited.

Physical and social functioning are related to work ability

Physical functioning is strongly related to work ability. Especially mobility limitations increase poor work ability to a large extent. Most of those who report having difficulties in walking a distance of 2 kilometers or climbing stairs consider themselves as disabled for work. Especially among men, also limited eyesight increases the probability of poor work ability. Problems in handling affairs with other people and presenting issues to strangers considerably increase the likelihood of limited work ability.

Most people who do poorly on tests of cognitive functioning, however, believe that they are able to work. This weak relationship between cognitive functioning and work ability is surprising. Apparently, most people understand work ability to refer to physical performance, and its relation to cognitive functioning is not as obvious.

Education and job satisfaction support work ability

A high level of education is related to good work ability among women and men of all ages. Of working-age people with a low level of education, one out of every three has limited work ability, whereas fewer than one out of every ten of those with an academic degree fall into this category. The relation between education and work ability is clear even among the oldest age group of 65- to 74-year-olds. A good education decreases work-related risk factors and increases the opportunities for maintaining work ability.

Sufficient expertise is related to good work ability. This relation is evident only among those with a higher level of education, a physically light job, and good health, however. Expertise seems, therefore, to be linked to workers' work ability estimates primarily when the more vital dimensions, health and physical work demands, do not explain work ability.

In addition, a positive attitude towards work, job satisfaction, motivation, enthusiasm, and strong professional self-esteem are related to good work ability. Those who are motivated by their work are also more often confident about their ability to continue to work than others are. Promoting job satisfaction thus also supports the maintenance of work ability.

Suitable work, good work ability

Physical work demands, especially strenuous work with hands, poor work postures, repetitive hand movements, and carrying, are related to poor work ability. Those whose work includes negative physical characteristics at least half of the time have a high risk of limited work ability. Especially 55- to 64-year-old women with physically demanding manual labour are in danger of having poor work ability. The frequency of physical work demands increases their significance with respect to work ability. In our study, fatigue, strain, tiredness, and a mentally void state were emphasized as factors of the mental strain of work. Experiences of such strain are not very common, but their relation to limited work ability is strong.

A great risk of limited work ability can be found in a work community in which workers have little opportunity to discuss goals. Opportunities to receive supervisory support and appreciation at work are related to work ability among men and to support from colleagues among women. Independence and control

over one's work are especially related to the work ability estimates of those aged 55 to 64. Moreover, requirements for proficiency and possibilities to develop one's special skills are related to the perceived work ability of men, in particular, whereas possibilities to learn new things at work are related to women's estimates of their work ability.

Mental demands that cause work exhaustion and fatigue are evident risk factors for work disability. The contents of work should be fitted to suit the worker's resources to avoid such a situation. Many work-related risk factors for work disability are significant, and this significance is clearly demonstrated by the fact that their absence means better work ability for older workers than for workers 10 years younger in jobs in which these risk factors are prevalent. Suitable work ensures the preservation of work ability also among older workers.

Work in its widest sense is the other central core structure of work ability, in addition to individual resources. Unsatisfactory work decreases work ability, and suitable work promotes work ability. The significance of work to work ability strengthens as workers grow older. This result is important because it is often more plausible to increase the positive aspects of work than to considerably improve the health and functional capacity of an older person. It is, therefore, essential to concentrate on increasing the positive aspects of work in promoting work ability.

Unemployment and insecurity at work affect work ability

The work ability of the unemployed, and especially the long-term unemployed, is poorer than that of the working population. The work ability of those who have been unemployed for less than a year does not, however, differ from that of their employed peers. In addition, the work ability of those who have been unemployed but who have then been re-employed is as good as the work ability of those who have had no experience with unemployment. These results indicate either that returning to work is an effective way to promote perceived work ability or that only those with good work ability transfer back to worklife once unemployed.

Economic difficulties and a low level of education are related to problems with work ability. As many as one third of those with considerable economic difficulties perceive their work ability to be limited, whereas the respective proportion for those with no such difficulties is only slightly more than one tenth. The risk of

those with long-term unemployment becoming marginalized can increase as their work ability deteriorates. Thus supporting rapid re-employment is an effective means with which to promote work ability and prevent marginalization.

Limited work ability is related to unemployment, but merely some uncertainty about work is enough to weaken perceived work ability. Regardless of good health, insecure jobs can make workers doubt that their work ability will remain good enough for them to survive at work. Thus, even though personal resources and work are the most important dimensions of work ability, it is also determined by societal factors such as the state of the labour market.

The work ability of people with families is better than that of those who live alone

Work ability is not only related to worklife, it is also associated with a person's close community, and, first and foremost, with the family. The work ability of people with families is better than that of others. Especially single and divorced men as well as widows have many problems with work ability.

Besides limited work ability, men who live alone are also in many other ways an underprivileged group. According to the earlier findings of the Health 2000 Survey, health problems, alcohol dependence, daily smoking, and having to regulate expenditures were more common among single or divorced men than among married men. Promoting the work ability of men who live alone can be considered an essential part of the comprehensive prevention of marginalization in this population group.

The poor work ability of widows indicates the impact of difficult life phases on coping with work. According to the basic report of the Health 2000 Survey, widows suffer more often from severe depression than married or single women.

Limitations in the work ability of the population have decreased since the end of the 1970s

The self-estimated work ability of 45- to 54-year-old women and 45- to 64-year-old men has improved considerably from the end of the 1970s to the beginning of the 2000s, but there has been very little change in work ability among 55- to 64-year-old women and 30- to 44-year-old women and men.

The steep differences in work ability according to the level of education, however, remained the same: the better the education, the better the work ability.

The prevalence of work ability limitations did not change statistically significantly in any of the educational groups during the 1980s and 1990s, but, due to the rapid increase in education, a growing part of the working-age population belongs to the group of high education, for which limited work ability is not common. Therefore, the change in the population's educational structure entirely explains the decrease in work ability limitations among women, and for the most part among men.

The change in educational structure also reflects the rapid change in occupational structures and work tasks in the two decades in question. Office work has become more common, and a far smaller section of the workforce works in physically demanding jobs. These changes, then, have partially decreased the requirements placed on physical work ability. On the other hand, other demands posed by worklife have increased. For example, the growth of mentally demanding work tasks that require versatile expertise may have increased the perceived limitations to work ability.

The work ability of the population may be enhanced by promoting public health, increasing the level of education and improving work

The future work ability of the population is significantly related to the changes in the different dimensions of work ability. In Finland, the occurrence of most of the diseases that limit work ability is declining. This positive trend may, however, halt or even start to reverse. The way in which overweight and substance abuse, for example, have become more common may significantly increase poor work ability in the future. On the other hand, the educational level of the population has increased, smoking has decreased especially among men, and the availability and effectiveness of health services have improved. These changes, as well as other factors that have positive effects on the health of the population create opportunities for work ability to improve.

Along with the rapid improvement in the educational level of the population, the expertise one needs at work will probably increase. It is necessary to maintain and further develop training and education that take into consideration the changing demands of worklife. The importance of life-long learning will increase.

Work is greatly valued in Finland. To ensure the positive development of work ability in the future, it is important that work continues to offer people good opportunities to develop their special skills, receive appreciation from others, and

participate in the work community. These aspects do not suffice, however, if job stress, insecurities, and other hazards decrease the attraction of participating in worklife. Much attention must be given to the development of physical, mental, and social work conditions to ensure that people consider themselves able to work as long as possible. The perceived rewards of work, and thus perceived work ability, also depend on the financial compensation that work and other means of livelihood will offer citizens.

11.2 Challenges for assessing and promoting work ability

Emphasizing the strengths of work ability

Promoting health and preventing diseases support the maintenance of work ability. Likewise, increasing workers' resources by means of, for example, education and, especially, strengthening the positive characteristics of work augments work ability. Enhancing work enjoyment, professional confidence, work control, and the support and appreciation received at work also increases work ability and decreases early withdrawal from work. Suitable work maintains work ability even when a worker's resources decrease.

Targeting the promotion of work ability

According to our study, problematic groups from the point of view of work ability include people with a low level of education, those with jobs in agriculture, and those with part-time jobs, as well as the unemployed, men living alone, widows, and the oldest group of employed women.

Many groups with limited work ability are outside of worklife and, thus, not within the reach of workplace actions promoting work ability. Our results on unemployment stress the importance of rapid re-employment for the maintenance of work ability among the unemployed. In addition, the means for promoting work ability among the most problematic groups include education, social support and appreciation, health promotion and, above all else, suitable work. For example, improving the work conditions, organization, and appreciation of the oldest employed women may increase their work ability more than merely supporting their personal resources.

Improving the determination of work ability

We need to develop measures and evaluative methods with which to further define work ability. According to our study, health and job strain have the greatest influence on self-assessed work ability, whereas, for example, expertise and the work community do not surface as easily. Multidimensional and more sensitive methods are essential if work ability estimates are to be accurate, if activities to maintain work ability are to be well allocated, and if their effectiveness is to be properly evaluated.

Promoting cooperation and coordination

External and internal cooperation of all stakeholders in worklife is needed to maintain work ability. Including work ability in plans at the national level and within organizations is important but not enough to support work ability. We also need a genuine desire to develop both models that maintain good work ability and models that enable people to participate in worklife even with limited work ability. Especially directing activities to promote work ability towards the unemployed, those with little education, or young adults requires well planned actions of various parties. In developing such cooperation, it is important to ensure that also dimensions other than health are taken into consideration, and the strengths of work ability are emphasized in all such actions.

Promoting work ability in the context of the life course

An important goal in maintaining work ability is to improve and lengthen work careers. Our results indicate that the best way to add good years to a career is to promote work ability already in the early stages of a career. We also found that good work ability during one's career also strengthens well-being during retirement.

The ageing of the population creates new challenges for the promotion of work ability. The number of people in the final stages of their career is growing. To maintain their work ability, we need to support their individual resources and to influence work characteristics, work cultures, and attitudes toward ageing.

Good work ability is not only worth pursuing for the sake of coping and continuing at work, it also supports well-being in other areas of life. At its best, promoting work ability can increase well-being and happiness, as well as the employment rate.

11.3 New research challenges

Our study answered many questions concerning the work ability of the Finnish population, but it also revealed the need for reliable information based on follow-up studies or on data from the workplace level. In addition, we also need international comparisons of the work ability of populations and, especially, of factors maintaining and promoting work ability. More scientific data are needed on all dimensions of work ability.

Health and functional capacity are the most vital determinants of perceived work ability. Not all healthy people are, however, able to work, and not all sick people have problems with work ability.

- Why do some people perceive themselves to be able to work regardless of illnesses and functional limitations?
- What factors contribute the most to the decrease in work ability among healthy people as they age?

A high level of education is strongly related to good work ability. On the other hand, perceived expertise is not as clearly related to self-estimated work ability.

- What does the level of education indicate when it explains a change in the work ability of a population?

Attitudes towards work are related to work ability. Longitudinal data are especially needed to assess the effect of positive work attitudes on the maintenance and improvement of work ability.

- Can work enjoyment and work enthusiasm compensate for health-related work ability problems?
- Does work commitment always promote work ability?

The characteristics of work are vital from the point of view of work ability. Good work maintains good work ability. Work as a whole cannot be studied at the population level; instead we need different research methods to produce information on the significance of work processes with respect to work ability.

- Are the work characteristics that support work ability different for women and men?

- How is the functioning of a work community reflected in the work ability of an individual worker?
- How does a constant change in worklife affect work ability?

Work ability is related to work, but it is also worthwhile promoting the work ability of people outside of worklife. Especially the maintenance of the work ability of the unemployed is in need of support from research.

- What indicators of work ability are valid in situations in which there is no work?
- Does a decrease in the work ability of the young lead to social exlusion?
- Is the uncertainty of work a risk to work ability?

The problems with work ability among men who live alone and widows indicate that family and a person's close community are important resources of work ability.

- In what situations does social support promote work ability?
- Do the attitudes of those in a person's close community affect perceived work ability?

The themes of our study did not cover the significance of work ability from an economic standpoint. However, justification of attempts to promote work ability requires information on the economic implications of these efforts.

- What is the relationship between productivity and work ability?
- What activities to promote work ability are cost effective?

Estimates of the work ability of the population are needed to support the decision making on health, work, and pension policies, for example. One of the most important challenges for research is thus focused on the future.

- How can we find the best predictors of the development of the population's work ability?

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