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Routledge

2015

Ilmarinen, J & Ilmarinen, V 2015, Work Ability and Aging . in L M Finkelstein, D M Truxillo, F Fraccaroli & R Kanfer (eds), Facing the Challenges of a Multi-Age Workforce: A Use-Inspired Approach . SIOP Organizational Frontiers Series, Routledge, New York, pp. 134-156 .

<http://hdl.handle.net/10138/299167>

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Work Ability and Aging

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Introduction

It is widely accepted, at least at the political level, that most developed countries cannot afford their populations to grow older without working longer. Many governments have therefore connected life expectancy and working life expectancy. However, a question to be answered remains: Is a longer work-life an ethically valid goal for everyone (Ilmarinen 2013)?

In this chapter, we propose that an affirmative answer to this question requires a major reconsideration of how we conceptualize work and work life. Specifically, we argue that work should be designed for the people, not the other way around. Many age-related/ageing processes have remained unchanged through the ages. Although healthy ageing has improved remarkably in the last hundred years, there are some biological, psychological and social “rules and laws” of ageing. Work-life, however, seems to follow a different track in which globalization, new technologies, and finances set the boundaries around length of working life. For example, the need for downsizing, merging and outsourcing due to economic fluctuations are difficult to predict, but when they happen, older workers are often the target group for fast solutions. As more individuals live longer the two tracks of human ageing and work fit increasingly poorly. That is, in many parts of the world working life increasingly does not coincide with the track of the ageing process. Thus it is no surprise that many older workers have serious problems remaining and reintegrating in

working life, as well as reaching the mandatory retirement age because work does not fit their resources, they have been laid off or they are not allowed to work any longer due to legislation.

So, what should be done? If the solution is changing the characteristics of working people to help them better fit into the global economy, it is the slow way with limited possibilities and it will take a long time before the ageing process has sufficiently changed to follow the track of the working life, which is much more unpredictable than the human ageing process and seems to be increasingly driven by profits in the short run. The more sustainable solution would be the adaptation of working life to the human ageing process. The nature of work must move with much longer strides towards people, rather than the other way around. As we are very well aware of a spectrum (the good, the bad, the neutral) of non-malleable ageing processes over the lifespan, the potential for developing work to become more age-friendly is much greater than the potential to change the ageing process. In addition, working life is designed by managers. To maintain the productivity of every generation, those in charge of these arrangements need a new competence to do so. This competence is called ‘age management’ (Ilmarinen 2006).

Work Ability Model

The work ability model is an evidence-based, comprehensive and systematic model for developing workplaces that facilitate better and longer worker careers. Because of its importance for understanding older individual work ability, we provide a brief overview of the model in this section. The model helps in understanding, how different factors of work place, human resources and operational environment affect an individual’s work ability (Figure 1) (Ilmarinen 2006, 2009, 2013; Lundell et al., 2011).

Extensive international research in recent decades on the work ability of older workers has identified the core factors affecting individual work ability (Gould, Ilmarinen, Järvisalo, & Koskinen, 2008; Ilmarinen, 2006; Kumashiro, 2008; Nygård, Savinainen, Kirsi, & Lumme-Sandt,

2011; Tempel & Ilmarinen, 2013). The research findings can be depicted in the form of a ‘work ability house’ with four floors (Figure 1). The three lower floors of the house relate to the individual’s resources: (i) health and functional capacities, (ii) competence, and (iii) values, attitudes and motivation. The fourth floor relates to aspects of (iv) work. Accordingly, we define work ability as the balance between the characteristics and demands of work; and the health, capacities, competencies, values, attitudes, and motivation of the worker. High levels of work ability occur when there is a good fit between the features of work and the individual’s resources.

As shown in Figure 1, the staircases between the floors indicate that all floors of the house interact. The strongest interaction exists between the floors of ‘work’ and ‘values & attitudes and motivation’ (floors 3 and 4). The third floor represents a worker’s subjective perception about themselves at their work – their opinions and feelings about a variety of factors connected with their daily work. Positive and negative experiences at work penetrate into the third floor, which is weighted based on these experiences.

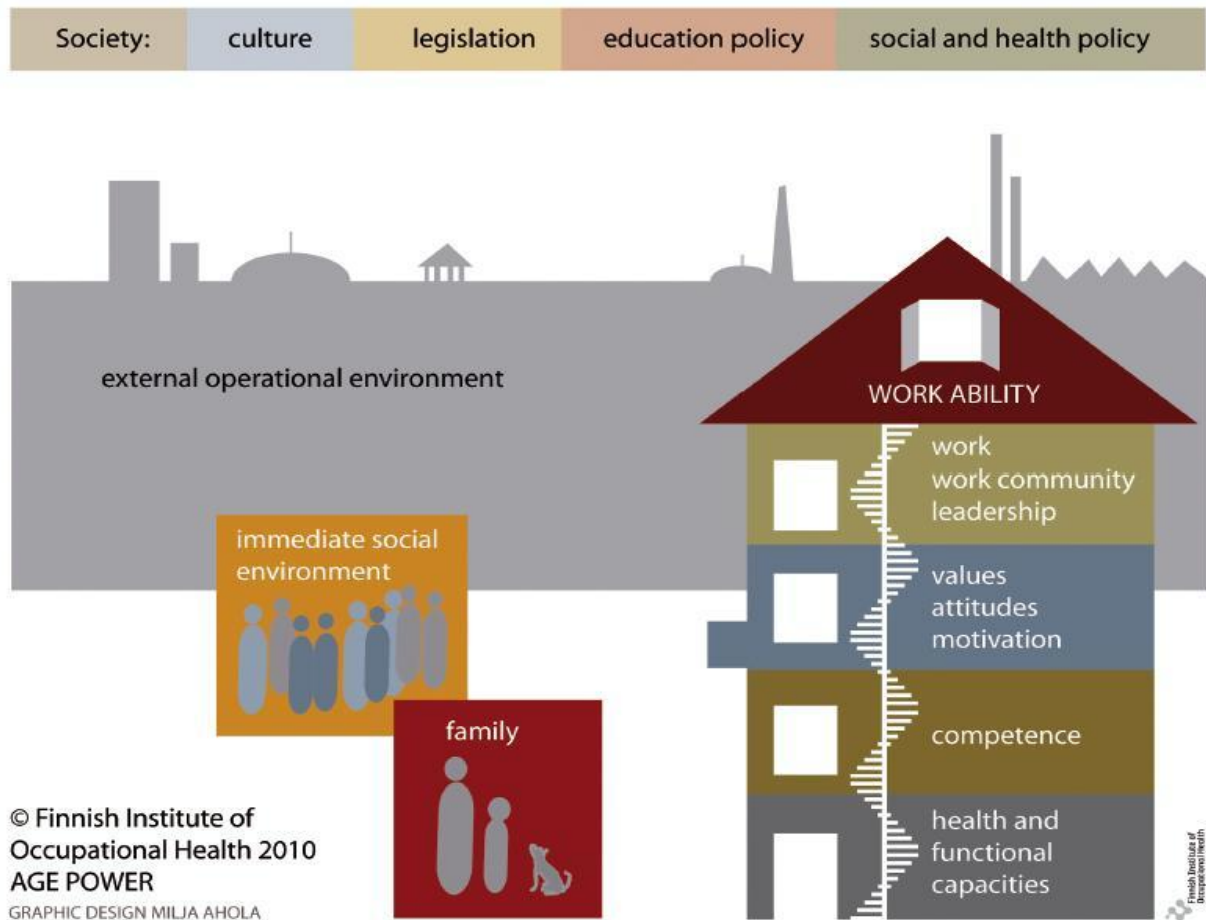


Figure 1: The Work Ability House Model, describing the different dimensions affecting human work ability. Based on Ilmarinen, 2006. Translated from Lundell et al. 2011 with permission.

The model also posits a third floor balcony, from where the worker can see the environment closest to their workplace: (v) family and (vi) immediate social environment. Both of these are affecting the worker's work ability. For example, there are negative and positive spillover effects from home to work and vice versa that affect well-being across these context (Kinnunen, Feldt, Geurts, & Pulkkinen, 2006). In addition, healthy lifestyles and hobbies strengthen health and functional capacities. Therefore, these two factors outside the workplace impact a person's work ability by either improving or worsening the balance between their work and their personal resources.

It is also important to note that an individual's work is under continuous change. The operational environment of work organizations tends to change due to globalization, new technology and economic situations. Companies today are facing increasing pressure to rationalize production. For example, rationalizing production often leads to downsizing, merging and outsourcing. As a result of these organizational changes, work intensity increases, workplace security deteriorates, and jobs disappear to low-cost service providers. Simultaneously, the features of the workforce are changing, for example due to ageing. Health problems may appear, and the need to update skills and competences becomes more acute. Unpredictable changes in the work increase the need for updates in the competence domain. The resulting overload and time pressure may then create health problems (Gould et al., 2008). The dynamics between the floors of the house make it challenging to reach a good, sustainable balance between work and a person's resources. .

The third floor in Figure 1 primarily reflects the work situation. The information flow from different floors and factors outside of work have great potential for affecting workers' attitudes, motivation as well their engagement and commitment to their work. The decision of whether to continue working in one's organization until retirement, or even beyond, can be expected to be made largely as a result of these factors. The more positively weighted the third floor is, the more likely it is that one will have a good working life and would be committed to a longer career. Key positive and interacting indicators include appreciation, respect, and trust in one's employer, support and feedback from supervisors, fair treatment, and engagement with work.

Regarding the issue of working longer, older workers have several matters to reflect on (before deciding). Worker responses to the question '**Can** I work longer?' involves consideration of first and second floor aspects: namely, health resources and competencies. In contrast, answering the question '**Do I want to** work longer?' involves consideration of third floor factors. A positively loaded third floor is a prerequisite for wanting to work longer. Still further, responses to the question 'Should I work longer **if I can** and **others want me** to work longer?' involve fourth floor

factors. In contrast to the previous questions, this is not a question the worker can decide by him/herself, but rather a question that requires input from one's supervisor and employer with respect to making it possible to extend the individual's work beyond retirement age within the current occupation. The puzzle of longer working life at the workplace should first bring all these three pieces (I can, I want, and I may) together. The better the fit between resources and demands, the better the individual's work ability and work-life balance. But there are still some additional factors which may importantly affect working life balance and work ability. These are described in the following section.

Role of family and immediate social environment

The work ability model explains the work-related factors influencing person's situation at the workplace. But, as shown in the "yard" in Figure 1 there are two more factors affecting work balance – namely family and close community. Family-related resources, habits and hobbies affect worker's health. Flexibility in working hours is often requested and evaluated from the standpoint of the needs of the family.

In addition, the values of the younger generations seem to be somewhat different from the values of baby boomers (Twenge, Campbell, Hoffmann, & Lance, 2010). As the leisure is valued more among younger generations, the balance between work and other domains of life may become more challenging in the future.

Role of the operational environment

Once we have achieved a decent balance in work ability, it may be easily disturbed by several factors in the operational environment. Globalization and new technology impose new demands on work organizations, like downsizing, merging and outsourcing, which are almost impossible to avoid. In reality, fighting against these effects at the expense of coping would probably be disastrous for organizations, especially during economic recession period. . Human resource departments are given a task that is impossible to realize always in a positive way. We do know that

downsizing increases mortality, especially from coronary heart disease, among those who stay at a company (Vahtera et al., 2004). The risk of mortality increased about two-fold in companies over a period of seven years following a major downsizing. Therefore, downsizing can have unexpected and negative effects and is often a dangerous policy both for workers and for the company. Increases in psychosocial work stress (e.g., combinations of high demand/low control or high exhaustion/low gratification) are also associated with greater than two-fold increases in the cardiovascular mortality of industrial workers (Kivimäki et al., 2002). Additionally, work stress is known to positively impact the desire to retire earlier (Wahrendorf, Dragano, & Siegrist, 2013). Such negative features of work are risk factors both for work ability and for longer working careers.

Work Ability and Aging

Work ability can be evaluated by the work ability index (WAI); a subjective survey instrument consisting of seven items (Gould et al., 2008; Rautio & Michelsen, 2013; Tuomi, Ilmarinen, Jahkola, Katajarinne, & Tulkki, 1998). The WAI score ranges from 7 to 49; the higher score the better the balance, especially between work and health. WAI scores are classified into poor, moderate, good and excellent categories. The WAI has a high predictive value: of those having a poor WAI at the age of 45–57 years, about 60% were on a work disability pension 11 years later (Tuomi 1997). The WAI has been translated into 28 languages today and is widely used in different cultures worldwide.

Work ability tends to decline with age (Ilmarinen, Tuomi, & Klockars, 1997), although the mean values of the working population from 20 to 65 years remain at good or excellent level (Figure 2) (Gould et al., 2008). However, about 30% of male and female over 45 years of age in both blue- and white-collar jobs show a marked decline by age in the WAI mean-score. In addition, the ageing trend of the WAI is different depending on the sector of the economy. Work ability mean scores are lower in farming and agriculture, the wood industry, the metal industry and transport, as

well as in social services and, in some countries, among teachers than in other branches. The best fit between work and individual resources has been found in the electronics and telecommunications sector, banking and insurance.

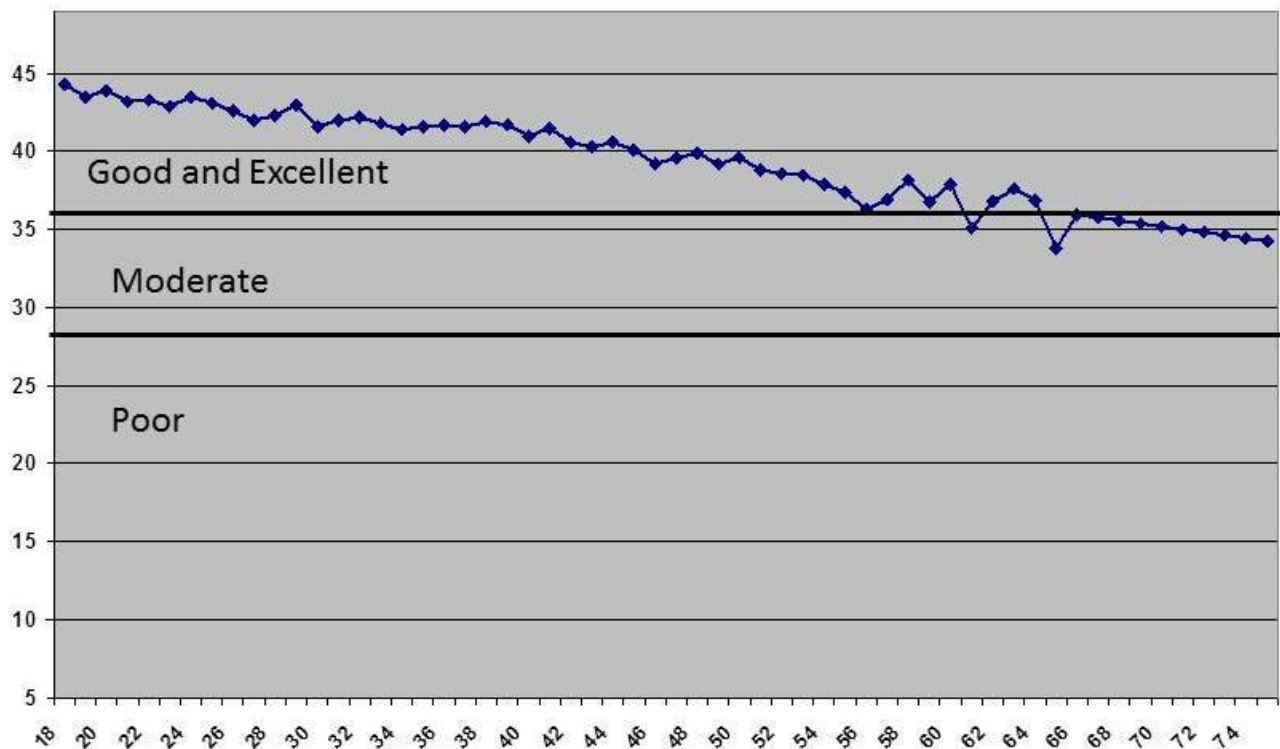


Figure 2. Work ability (Y: WAI-score) and aging (X: Age) in Finnish employed population (extrapolation from age 66 onwards). From Gould et al, 2008.

Individual differences in work ability increase with age. The over 45-year-old working population in Finnish small and midsize companies is more heterogeneous in work ability compared to younger workers. About 15–30% of 45-year-olds have a moderate or poor WAI. They are at risk of losing their work ability if no preventive or corrective actions are taken (Figure 3; Ilmarinen, 2006).

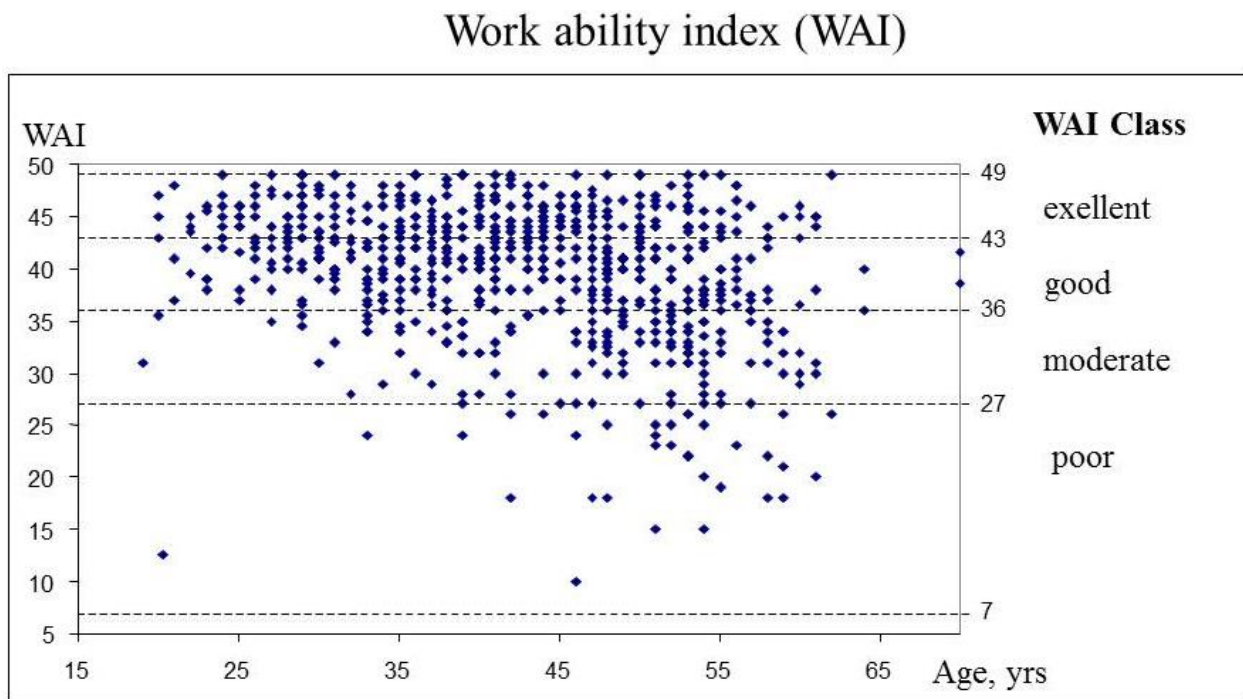


Figure 3: Individual distribution of work ability scores by age in small and middle-size enterprises in Finland. From Ilmarinen, 2006.

The declining trend of work ability by age is due to the imbalance between resources and demands, as discussed earlier. Working life seems to develop on its own track, which does not follow the track of normal ageing processes. Changes in work do not follow the changes in working people. The most important reasons why the WAI declines with age can be identified on the fourth floor of the model. As a consequence, the third floor is often weighted negatively, and older employees and workers consider their work ability as deteriorating.

Promotion of Work ability

The work ability house model suggests that actions in the workplace to promote work ability should cover all four floors (Ilmarinen, 2013). Workers and employees are more responsible for their health and competence, and the employer has more responsibility for organizing and arranging the work in ways that support the workers. The promotion concept is therefore based on cooperation

between the employer and employee; together they can create a better balance in the workplace and enhance work ability. Shared responsibility for measures to be taken will make them more acceptable and feasible and lead to a win-win situation.

Health promotion (first floor) covers a variety of lifestyle habits in terms of eating, drinking, physical activities, recovery and sleep. Besides a healthy lifestyle, preventive and proactive measures by occupational health services and good treatment of acute health problems play an important role in maintaining good health during the course of life at work. The competence of occupational health experts should therefore also cover ageing and health issues. Their understanding of the adjustments needed at work due to changes in health and functional capacities induced by ageing is a valuable resource for creating a better working life for older workers. Because many health problems are work-related, the health risks of work should be identified and prevented in the workplace (fourth floor). The strong interactions between health and work demand an active collaboration between occupational health and safety experts, employers and employees.

Maintaining **professional competence** requires the continuous updating of skills and competences (second floor). On-the-job training, together with various types of special staff training courses, gives older workers the opportunity to strengthen their abilities. However, changes in the learning process of older workers should be taken into consideration. Learning strategies, learning conditions, the use of images, relaxation and timetables for acquiring knowledge vary between younger and older workers (Ilmarinen, 2006; also see xx this volume). The most important platform for learning is the work and workplace itself. On-the-job learning is possible if the work content and tasks are designed so that they provide learning experiences. Positive learning experiences at work throughout one's career reduce the number of barriers to learning new things and correct negative attitudes towards learning. The attitude of the supervisor is also important; if the supervisor is committed to lifelong learning and supports it by providing training opportunities, an important

obstacle to learning for senior employees is removed. Continued learning during ageing is an important success factor for active ageing and a longer working life.

Values, attitudes and motivation (third floor) cannot usually be the direct target for intervention. They tend to be indirectly influenced, especially through positive changes on the fourth floor. This means that activities should be focused mainly on the work floor. Several improvements in management and leadership skills impact the features of the third floor. People should feel that they are respected and that they can trust their employer. They expect to be supported by their supervisor in demanding and difficult work situations. They need feedback on whether the work was done well, as well as how to improve their performance. The dialogue between supervisor and workers should be a continuous process, not a one-off annual appraisal interview. Fair treatment and zero-tolerance of age discrimination is noted and appreciated among employees. Individual engagement and commitment to work are key indicators of a third floor. It should also be mentioned that employees are ultimately responsible for their own values, attitudes and other personal factors. Adjusting their own mind-set towards work, their internal resources and family issues are necessary to build up a better, sustainable balance in working life. Such a balance creates a positive weighting on the third floor.

The ‘work floor’ is the largest and heaviest floor of the house - model. It consists of the work environment (physical, mental, social), work organization and work arrangements, working time, the work community and work tasks, as well as management. Managers and supervisors play an important role because they have the authority to arrange the work processes and individual work tasks. All decisions and changes in work go through their hands. They are also responsible for occupational health and safety matters, including risk assessments. Risk assessments should take into consideration the large individual differences in functional capacities and health of personnel, disabilities, gender issues, etc. Workers and employees of all age groups are vulnerable to harmful work exposure. Because adapting work to one’s abilities, skills and state of health should be a

continuous and dynamic process, based on adequate risk assessment, adapting work to older workers' health status and needs should not present an additional burden. Age is just one aspect of the diversity of the workforce, but the awareness of managers and supervisors of age-related issues needs to be improved. All these age-related actions and improvements needed at workplaces can be termed 'age management'.

The redesigning of individual work tasks according to the strengths, needs and capabilities of older workers is crucial for securing the work ability, well-being and productivity of employees. For example, decreasing the physical workload, introducing short breaks in work processes and taking account of health risks when scheduling shift work and flexible working arrangements are all age-friendly measures. On the other hand, the strengths of older workers should be better utilized (e.g., strategic thinking, quick-wittedness, considerateness, wisdom, ability to deliberate and rationalize, holistic perception, commitment to work, loyalty towards employer etc.; Ilmarinen, 2006; Ruoppila, Huuhtanen, Seitsamo, & Ilmarinen, 2008). The easiest way to identify new needs and ways to redesign the work is to ask older workers how they would like to change and improve their work and its arrangements. Also, human engineering should be utilized to create practical solutions in ergonomics and work arrangements for older workers. Another useful option is to share the work duties between younger and older employees, utilizing and combining their different strengths.

Organizational Benefits of Promoting Work Ability Among Older Workers

Company examples demonstrate that the cost of investments in work ability promotion is outweighed by the benefits. People can continue working productively, the work atmosphere improves, productivity improves, and age-related problems decrease. Cost-benefit analysis shows that the return on investment (ROI) can be very good: the return on EUR 1 amounts to EUR 3–5 after a few years. The positive ROI is based on lower rates of sick leave, lower work disability costs and better productivity (Näsman & Ahonen, 1999; Näsman & Ilmarinen, 1999).

Long-Term Effects of Work Ability

Recent 28-year follow-up studies of ageing workers using a controlled research design showed that work ability at 45-58 years of age significantly predicted daily living independence later in life, between the ages of 73 and 85 years (Von Bonsdorff et al., 2011). The better the work ability was before retirement, the more probably is limitation-free life later on. Therefore, investments in work ability and active ageing in workplaces need to be secured during the working years. The investments in work ability, occupational health and safety in the workplace are also investments in the citizenry across the lifespan. A healthier, limitation-free and independent-living older generation is an important resource in our society. As a consequence, the old-age-dependency ratio becomes less of a burden for taxpayers.

Job and Skill Obsolescence

Old-fashioned jobs are becoming rare due to new technology and computerization. A study of expected impacts of future computerization on US labor market outcomes shows that from 702 detailed occupations 47 % are in the high risk category (Frey & Osborne, 2013). These jobs at risk could be automated relatively soon, perhaps over the next decade or two. In addition, computerization can substitute for labor in a wide range of non-routine cognitive tasks. Advance robots are gaining enhanced senses and dexterity, allowing them to perform a broader scope of manual tasks. Frey and Osborne (2013) state, that this is likely to change the nature of work across industries and occupations.

The computerization means that the diversity in jobs as well as the polarization between the jobs increases. A substantial part of older workers are today in occupations, which will either change remarkably or even disappear from labor market during the next decades. Their professional

competence might be strongly and unilaterally connected with the occupations at highest risk. As a consequence, skill obsolescence may become an acute scenario for these employees. Therefore, we have to find solutions both for job and skill obsolescence for older workers.

New jobs created over the past decades are fundamentally different from the ones that have been lost (Morris & Western, 1999). The new jobs tend to favor educated workers over those with less education and skills; more education translates into higher earnings, but this payoff is most pronounced at the highest educational level. Low-skilled positions are made redundant by technology, which decreases the need for less-educated workers. Creating new jobs at workplace emphasize the role of management: when technology replace some tasks in an organization, managers are responsible for organizing the remaining tasks. Therefore, new technology should be married to complementary organizational practices, because it opens up novel possibilities for both discretion and control.

The older workers face the same trends and changes in workplaces than the other age groups. Their old job they have been recruited with good professional skills some decades ago has changed remarkably. To avoid skill obsolescence these workers need to continuously update their skills and to accept and utilize lifelong learning concepts. Skill obsolescence will lead to increasing job insecurity over the life course, making it difficult to maintain adequate level of labor market participation of older workers (Allen & de Grip, 2012).

In their dynamic model, changes in skill requirements and the learning of new skills keep each other roughly in balance. Workers in IT-intensive jobs are not more likely to perceive skill obsolescence than workers in less It-intensive jobs. But, those employed in IT-intensive jobs are more likely to learn on the job. The authors state that skill obsolescence can be a more or less structural characteristic of many jobs. Investments in training as well as on-the-job learning should be a structural characteristic of jobs that are highly challenging and dynamic in implementing the new technology. Older workers have longer job tenure which has a negative effect on the changes

of loss employment, indicating, that workers accumulate valuable additional human capital through work experience. However, the authors report that this positive effect can decrease after 18 years of additional tenure. Therefore, a sustainable training also for the oldest workers is needed. From aging research we have learned that learning is not dependent on age, but on the way how training is organized. Age-adjusted learning concepts should be utilized for older workers (Ilmarinen, 2006).

Overqualification and Underemployment

There is widespread evidence that many workers possess higher qualifications than are needed for their job. The prevalence rates of overqualification among British graduates in their first job are 36 % for men and 41 % for women (Brynin, 2002). Society produces more education than the labor market requires. The reasons can be social equality, efforts at social closure, personal demand for social status as well as calculations that any higher level education helps job chances even if there are diminishing returns. Raising the average years of education makes low-skilled workers scarcer, raising their wages, while at the same time increasing supply of highly educated workers, hereby reducing their wages.

Overqualification has positive effects on wages but produces lower returns to education compared with those who are “correctly” placed. Overqualified people achieve higher rewards and generate a premium relative to the job but penalty relative to the qualification. The value of qualification obviously changes over time as the supply and demand for them changes. It would be expected that this growth of qualification would result in an increased demand for appropriate skills, and that the qualification which partly embody these would obtain a greater pay-back whether in term of social status or wage. In fact, this does not appear to be happening or it is at least subject to counterforces.

Overqualification can be structural or an individual, life course phenomenon. People start lower down the scale, thus beginning overqualified but subsequently doing work that fits their level of qualification. If this is not true, the overqualification is a structural phenomenon. There is always

likely to be at least marginal overqualification because a certain proportion of people choose not to use the full extent of their qualification, for example women who make career sacrifices for family reasons.

Underemployment means working in a job that is below employee's full working capacity and it is predicted to become more relevant in the future. For example 8.8 million workers in U.S. are forced to work part-time because they are unable to find suitable full-time jobs. Altogether, combined proportion of underemployed and overqualified range from 17 % to one third; of which 20% are highly overqualified (McKee-Ryan & Harvey, 2011).

As the average education of workers increase, there is a greater possibility of workers experiencing underemployment. Underemployment is a multidimensional, complex construct which can be described by management scholars, economists, sociologists and psychologists. In general, it refers to the match between employee's knowledge, skills, and abilities and the demands of their job. This definition sounds very similar of those described earlier as work ability concept, but the latter have more dimensions for creating the best person-job fitting.

Underemployment is prevalent in all type of jobs: executives, expatriates, faculty member, business school graduates, non-academic university employees, retail sales workers, postal workers, medical and labor technicians, hospital workers; underemployment affects employees across wide range of occupations. Interestingly, demographic characteristic like gender, age and education did not predict underutilization of skills (McKee-Ryan & Harvey, 2011). Age gives a mixed picture: underemployment spiked early (18–24 years of age) and then began to decline, and older workers as long-tenured employees faced underemployment because of increased layoffs and age discrimination upon reemployment. Underemployment showed U-shaped pattern by age.

Underemployment has negative outcomes and many of them seem to resemble the concepts of the third floor of the work ability house: job and career attitudes, and features of psychological well-being. Job performance can decline, too. Employers may be reluctant to hire overqualified

persons because they believe that these workers will move on to more suitable jobs when given opportunity. On the other hand, some performance advantages can be possible, if employees can influence in the situation. Employer can provide challenging tasks, advancement opportunities, and empowerment to prevent withdrawal risk.

Summing up the challenges of job and skill obsolescence as well as overqualification and underemployment from the viewpoint of work ability concept; these special questions focus into the floors of competence and work. Job obsolescence is a characteristic of work, which has not been developed according to the new demands of operational environment of the enterprises. The solution for avoiding job obsolescence is in the hands of the managers. Competent management can foresee and predict the coming challenges and changes in market, and build up a strategy which can effectively response for example to globalization, new technology and demographic change. In the strategy, the development of jobs should be combined with development of the competences of the personnel. If the dynamics binding these two developments together is missing, many older workers will be laid off. The management is in charge not only for the work arrangements, but also for giving opportunities to update the competences of their manpower. Skill obsolescence should be prevented by sustainable training programs and on-the-job training. Aging is not a problem, and should not be perceived as one, since learning new skills is possible nearly for everyone in work age. As indicated before, valid pedagogic and didactic concepts are necessary for older workers.

Overqualification and underemployment are characteristics often found among younger and older employees, and the reasons and consequences for this pattern give a rather mixed picture. In general, overqualification describes a theoretical and practical compound of skills and knowledge which are not needed (job obsolescence), or cannot be utilized at given job (underemployment). So, the solution would be to change the job or to develop the job into a direction where these extra competences can be utilized. Empowering people to develop the content or arrangement of their jobs can lead in better fitting and utilizing their human capital. In the future, it is perhaps necessary

to have several competences and skills which can be utilized during the working age. Multi-skilled workers are less vulnerable for changes in work life.

Underemployment is both a characteristic of overqualification and lack of appropriate job. People do have a job, but they could and need to work more hours, or they wish more challenges from the content of their work. The balance in work ability house is therefore disturbed. The second floor (competence) and fourth floor (work) do not fit well together. The consequences for the imbalance can be recorded on the third floor (attitudes, motivation and commitment). The solution is first to identify whether there are any possibilities within the company to get more work or to get tasks relevant to own competence. Secondly, the older workers should be given the possibility to describe, explain and show the added value of their ageing process: the several dimensions of mental growth should be useful for the employer. Thirdly, job descriptions can be developed into the direction where the older workers are getting stronger. This process of action is not only valid for underemployed or overqualified people, but also to everyone experiencing an imbalance between competence and work.

Good work – Longer Career Program 2010-2015

The Finnish technology industries signed a collective agreement with four trade unions in 2009 concerning a programme that aimed to maintain work ability and to promote work well-being in the sector (Ilmarinen, Ilmarinen, Huuhtanen, Louhevaara, & Näsman, 2013). Both social partners accepted the work ability house model as a common framework for the programme. The goal of the trade unions was to improve working conditions, while the employer wanted to achieve longer working careers. The name ‘Good Work –Longer Career’ (2010-2015) was established, indicating the win-win goal for both program partners. In 2013 the program includes 50 companies and some 5,250 workers and employees.

The companies' situations were analyzed using new methods called Work Ability-Person Radar (WA-PR); a survey, and Work Ability –Company Radar (WA-CR); a dialog technique, with which the measures to be taken in each floor were identified and prioritized. The WA-PR indicates the strengths and weaknesses in each floor of the work ability house according to the average experiences of the personnel. It shows quantitatively, which domains need improvements and enhancements. In addition to WA-PR, the WA-CR is a dialogue instrument that is used by a project group at the company specifically selected to be responsible for the programme. The project groups consisted of members of executive board, human resources team, and representatives of various trade unions active at the workplace. Occupational health, safety officers, and representatives of the supervisor/foreman level were also included. With help of an external facilitators, project group first prioritized the floors, identified the measures needed, and then prioritized the measures to be taken at each given floor. A preliminary plan for actions was then drawn up. The benefit of the WA-CR process is that it made the 'doing' feasible and concrete; it focused attention on key development goals in the workplace to maintain work ability and to enhance the work well-being, taking into consideration both the opinion of personnel, and the tacit knowledge and experiences of the project group.

The preliminary base-line results of the program show interestingly, that the average results of indicators improved by age, and the age group 55+ show the best mean scores in all other floors except the health and functional capacity (Table 1). Health and functional capacity showed a decline by age, like the work ability index in earlier studies.

Interesting age-trends were also found across different personnel groups. For example, the competence (professional competence, job-related training, learning new skills at work; 2nd floor of the work ability house) was at higher level by age in all personnel groups. However, significant differences in competence existed between blue collar and white collar workers. In contrast to white collar workers, blue collar workers showed lower mean-levels on all indicators of competence. The

level of competence indicators of blue collar workers were close to “critical” level of score 7 in all age groups except the oldest one.

<i>Work ability house structure</i>	<u>Age group</u>				total
	Under 35	35 to 44	45 to 54	over 54	
Health and Functional capacity (1 st floor)	8.47	8.14	8.02	7.83	8.16
Competence (2 nd floor)	7.13	7.28	7.38	7.52	7.30
Attitudes and Motivation (3 rd floor)	7.15	7.21	7.34	7.57	7.28
”Work” (4 th floor)	6.79	6.82	6.87	7.07	6.86
Family and Close Community (nearby environment)	7.50	7.42	7.76	8.09	7.64

Table 1: Mean levels of the work ability house structures by age group. The level of score below 7 in the scale is a reference for moderate (5.00-6.99) and from 7.00 to 8.99 for good results.

In attitudes and motivation (appreciation, trust, commitment, motivation, fair treatment; 3rd floor of the work ability house) a similar trend was seen: the indicators improved by age but the differences between the personnel groups remained. The level of indicators of blue collar workers were also in this floor close to “critical” level of score 7 in all age groups except the oldest one. The critical score 7 is based on predictive power of WAI item 1, which indicated in 11-year follow up study that the incidence rate of work disability pension increased among persons showing a poor or moderate work ability at onset of the follow-up study (Tuomi, 1997).

The work (work arrangements, support of supervisor, feedback, support of colleagues; fourth floor), showed the poorest results across the whole house for all personnel groups. The blue collar

workers were, on average, at reasonable level in all age groups. Also employees were close to score 7 in all age groups except the oldest one. The upper employees, including supervisory and managerial occupations, also scored close to the critical levels. The differences between the personnel groups remained, but in oldest age group the differences across white-collar groups disappeared.

The Work Well-being Index (WWBI), aggregating all indicators from different floors, showed an improvement by age by all personnel groups (Figure 4). The blue collar workers, however, had the lowest scores in all age groups. The employees and upper employees were close to each other across age groups.

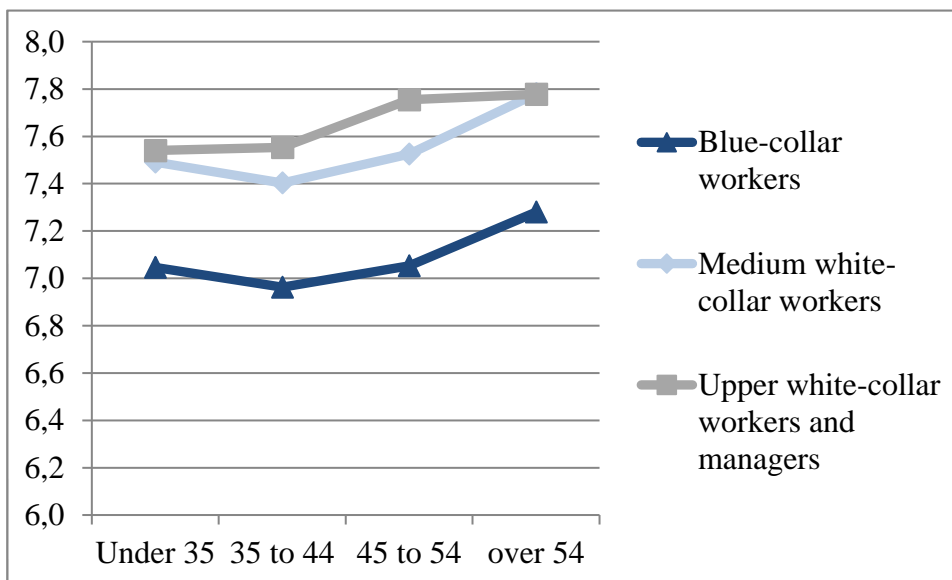


Figure 4: Work Well-being Index by age and personnel groups

The results of Work Ability–Personal Radar survey showed that the circumstances in all age groups are considerably poorer on the following indicators: supervisors’ feedback, work arrangements (4th floor), appreciation, trust in employer and fair treatment (3rd floor), sufficient education (2nd floor), resources for friends and hobbies (dimensions outside the house) and energy to work until retirement. Altogether, over 150 different development-oriented actions and interventions are underway tackling these issues in 40 companies. The most interesting findings of this study was that several indicators of the work ability house construct improved by age. Research is needed to understand this promising phenomenon better, as well as research clarifying the differences between work ability and the new paradigm work well-being.

Challenges for the Future

Our societies are getting older and we should be well-prepared for it. Work life is also getting more diverse and more demanding than before. Aging means that the growing older population at work is more heterogeneous in various characteristics than before. Therefore, the following general challenges should be met by effective measures in workplaces:

- **Increase the awareness level of age and ageing, both in society, enterprises and among individual employees and workers.** The universities and research institution are responsible to create and deliver the facts about aging. The training institutions should convert the facts to age management into training and coaching programs and courses. In enterprises, both the supervisors and the employees should have a sufficient awareness level in aging matters. In organizing the training, the age-adjusted training concepts should be utilized for older workers.
- **Change the attitude towards age and aging.** Based on a better understanding about aging matters, the attitudes can be changed. The benefits of aging in functional capacities, mental growth and competence should be concretized. Understanding that each

developmental phase in the life course has its strengths and weaknesses, emphasize, that the added value comes from the differences between people, not from their similarities.

- **Redesign the work for the diversity of workforce and older workers.** The redesign and arrangements of work are in the hands of supervisors and managers in the company – they have the authority to arrange the work processes. Better awareness level about ageing and fair attitudes towards ageing are the prerequisites for age-friendly working life. Age management is a new competence for them. Age management skills and good practices will help them to cope with the varying resources of their teams. Changing of the individual potentials in health and functional capacities, competence, values, attitudes and motivation makes the difference, not the age. Therefore, with help of the age management tools, the more individual solutions can be created for older workers. Promotion of work ability belongs to the competence of the supervisors and managers.

Research Challenges in Work Ability and Aging

Research challenges regarding the work ability and aging can be listed as following (modified according to; Gould et al., 2008):

Generally, reliable information about work ability based on follow-up studies is needed. Also, international comparisons of work ability, and especially, research on factors maintaining and promoting work ability. Well-designed intervention studies in organization level are most welcome. More scientific data are needed on all dimensions of work ability, including the dimensions of family and close community, as well as from operational environment.

- **Role of health and functional capacities in 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 decreases in work ability among healthy people as they age?
- **Role of Competence in work ability:** How does the population level increase in education affect work ability? Why do the indicators of competence have less explanatory power than

other dimensions of work ability? How valid are self-reports of occupational competence?

Overqualification and underemployment issues? Personal skill obsolescence caused distress: conceptualizations and interventions. In general: What is competence and can it be efficiently measured at the organizational level?

- **Role of Attitudes in work ability:** What factors of work and management have positive effects on appreciation, trust, fair treatment and support? Does work commitment always promote work ability? The cause and effect of motivation and commitment at work?
- **Role of work, work environment, work arrangement, work community, management in work ability:** Why there are gender differences in work ability? What are the work characteristics that improve and impair work ability by age? How is the functioning of a work community and team reflected in work ability of individual worker? How does the constant change in work life affect work ability? How can we more accurately predict the age-sensitive changes in work-life?
- **Role of family and close community in work ability:** In what situations does social support promote work ability? How the attitudes of close community affect work ability?
- **Work ability among unemployed, handicapped, and disabled people:** A rising part of the workforce will experience periods of unemployment as well as difficulties of return to work. How does work ability change by age during unemployment periods? What is the role of work ability by age in returning to work? Is the work ability of handicapped and disabled people affected by age? How to promote the work ability of handicapped people?

The theme work ability and productivity is of great interest for the employer. The investments for promoting the work ability of employees and workers depend on economic implications of these efforts. Therefore following research questions are important:

- **Productivity and work ability:** What is the relationship between productivity and work ability, preferable in longitudinal research design? What activities to promote work ability are cost effective?
- **Work ability at the population level:** Work ability is not only an important measure of situation in workplaces. Also the work ability at the population level is needed for policies, because it has a high predictive power for the employment rates of all generations, but especially for older workers. The possibility to increase the retirement age and to get people working longer depends strongly on the work ability of older workers. The crucial indicators of longer careers are; if older workers can, will and may work longer. In the future we should be able to follow the work ability of our working population, and to promote it by comprehensive and systematic concepts. Therefore following research information is needed:
 - **Public policy and work ability:** What are the policies that support high levels of work ability? What are the features of operational environment which support the work ability? What are the best predictors of the development of the populations work ability?

Finally, as mentioned earlier the ethical and moral issues of prolonging work life should be studied. At least following question is interesting:

- **Ethics and moral issues of prolonging work-life:** Which are the ethical problems in prolonging work life considering workers, employers and society?

Final Remarks

Work ability is an important human capital of workers throughout their whole career. It is a comprehensive concept requiring continuous processes at workplaces aiming to improve the fitting of human resources and work together. During aging, the diversity of work ability of workers increases. Also, the diversity of work increases. Everybody, regardless of age, needs “good work”,

at least a decent job. Older workers are heterogeneous working population; thus, standard solutions and designs of work are seldom the best option for the individual or organization. Therefore age-adjusted, equal opportunities are necessary. Plenty of scientific knowledge is available about how to promote work ability of older workers. The managers and supervisors should have the competence to redesign the work for aging society. A proactive and comprehensive approach according to the work ability house –model will avoid obsolescence of job and skill. Also, solutions for overqualification and underemployment for all generations can be created. In the proactive development of better work and longer work careers both the workers and employers are responsible.

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