





# Validation and test of central concepts in positive work and organizational psychology

The second report from the Nordic project *Positive factors at work*

*Marit Christensen (Editor)*

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# Preface

Positive psychology has been suggested as one possible way to meet the challenges facing work life in the Nordic countries. Increased demands, global competition, technological innovations, and changed expectations on the part of the workers are some of the challenges encountered by the Nordic welfare societies. Positive psychology is the study of positive experiences, personal strengths, and a meaningful life (Seligman & Csikszentmihalyi, 2000). The ideas of positive psychology have met with a great deal of interest all over the world, not least in the Nordic countries. A recent search for “positive psychology” as a subject term resulted in 976 hits in databases including psycINFO, psycARTICLES, and Business Source Complete. For the field of work and both organizational psychology and occupational health psychology, this opens a promising field of research on issues related to employees’ experiences of motivation, engagement, learning, and meaning, rather than having a one-way focus on reducing stress and negative work characteristics. Focusing on what makes workplaces and their employees resilient and adaptable to increased demands and continual changes is a way of meeting the global challenges we have in Nordic working life. The main aim of the present project has been to develop theory and methods concerning positive factors at work adapted to Nordic working conditions. The project began in 2006 and has lasted for a three-year period. It is a joint collaboration between researchers from Norway, Sweden, Finland, and Denmark. One previous report has been published and serves as a methodological base for further work. The first report gave an overview of existing Nordic projects focusing on positive factors at work, both theoretically and methodologically. The report suggested a working model, which has been a focal point for further work in the project. In 2007 the reliability and validity of the various instruments for measuring positive factors were tested using the established data to form a foundation for a survey questionnaire on positive factors at work in Nordic countries. In 2008 different parts of the working model were tested based on the results from the first validation process. The results from 2007 and 2008 are presented in the present report. The joint work undertaken by the Nordic research group has resulted in very interesting results and significant networking with other research groups in Europe and the US. The research collaboration is continued through a new project named “Building Engagement and Healthy Organizations”, building on the results from the latter project.



# Abstract

The report is based on the results of the project “Positive Factors at Work” financed by the Nordic Council of Ministers. The project is a joint venture project between the Nordic countries of Norway (Department of Psychology at the Norwegian University of Science and Technology (NTNU); The Norwegian School of Management, BI), Sweden (Department of Psychology at Stockholm University), Denmark (The National Research Centre for the Working Environment in Denmark (NRCWE)), and Finland (The Finnish Institute of Occupational Health). The main aim of the study is to develop theory and methods on positive factors at work related to Nordic work environmental contexts. The aim has been twofold: firstly, to validate chosen measures of positive work factors in Scandinavian datasets, and secondly, to test our suggested working model of positive factors at work developed in the first report. The projects with included measurements have been presented in our first report on the Nordic project (<http://www.norden.org/en/publications/publications/2008-501>).

The first part of the present report tests the reliability and validity of the measurement instruments used in the project. The validation studies present theoretical background and definitions, work life relevance, and further results of factorial validity and construct validity. The validated measures included positive states and experiences at work, job resources, and personal resources, in addition to several positive outcomes. The second part of the report focuses on the testing of five different parts of the suggested working model. All of the studies included different types of job resources and three of the five studies also included measures of job demands which, if high, are assumed to have a negative impact on employee well-being and organizational outcomes. The results showed the power of positive factors and processes that may lead to, for example, good performance at work, employee well-being, and staff retention. One of the studies showed that in addition to job resources also a personal resource, optimism, may have an important role in employee well-being. The studies also included positive mediators such as engagement, flow, meaning at work, and commitment.

In conclusion, the results support our working model, and the major challenge in the Nordic welfare societies is therefore to promote resources and strengths in employees and organizations.



# 1. Introduction

## 1.1 Positive psychology in work

*Thomas Clausen*, National Research Centre for the Working Environment (NRCWE)

Positive psychology is about studying and understanding positive psychological phenomena – the things that *work* for people, organizations and societies. What makes people resilient? What makes organizations prosper? What causes individual well-being? What makes societies function as harmonious entities? Such questions, framed from the vantage point of positive psychology, are difficult to answer using the conceptual framework of mainstream psychology and its preoccupation with phenomena related to risk factors, mental illness and suboptimal organizational outcomes. Accordingly, the basic premise of positive psychology is that positive phenomena must be investigated and understood in their own right, as it is impossible to understand the factors that leads to health, balance and meaningfulness by investigating illness, distress and alienation (Snyder & Lopez, 2007).

The insights of positive psychology have also manifested themselves within work and organizational psychology. These trends have entailed a focus on more positive organizational phenomena, as for instance flow, work engagement and well-being at work. The conceptual framework of positive psychology thus appears to offer a promising starting point in terms of promoting positive outcomes at individual, organizational, and societal levels.

At the individual level positive work and organizational psychology focuses on employee well-being by exploring positive work-related states and experiences (Cameron, Dutton, & Quinn, 2003). At this level positive work-related states and experiences are deemed relevant in terms of their potential contribution to personal growth and well-being (Kopperud, 2008).

At the organizational level positive work and organizational psychology focuses on “positively oriented human resources strengths and psychological capacities that can be measured, developed and effectively managed for performance improvements in today’s work-place” (Luthans, 2002). Thus, at the organizational level positive work-related states and experiences are deemed valuable not only in their own right but also as drivers for organizational performance (Harter et al., 2002).

Finally, at the societal level the insights of positive work and organizational psychology also appear promising in order to meet the labour market challenges related to the demographic changes which are expected to con-

front the Nordic countries over the coming decades. A renewed emphasis on promoting employee well-being may increase the intrinsic motivation of employees thereby contributing to increasing labour supply and reducing early retirement and sickness absence related to psychosocial wear-and-tear at the workplace (Clausen & Borg, 2008; Keyes, 2007).

The field of positive work and organizational psychology thus appears to hold some interesting insights as potential responses to the challenges that are likely to confront the Nordic labour markets over the coming decades. The insights of positive work and organizational psychology may thus contribute in novel ways to the discussion on several salient issues in the Nordic societies: How do we promote employee well-being? How do we enhance performance capacities of work-organizations in the Nordic countries? How do we reproduce the Nordic welfare states by ensuring an adequate labour supply?

In the light of this promising potential of positive psychology, it will be interesting to investigate whether the hypotheses put forward in positive psychology can find empirical support in a Nordic context. In this report we will thus present, validate and assess the empirical utility of a series of concepts that have proved their prominence in Nordic research on positive work and organizational psychology (Christensen, 2008). Figure 1 shows an overview of the concepts that will be the subject of our examinations in this report.

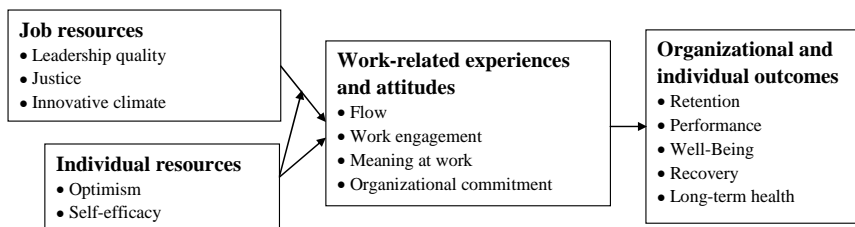


Figure 1. An overview of key concepts within positive work and organizational psychology and their expected associations

Figure 1 conceptualizes the relationships between a series of positive factors that can be categorized as antecedents, mediators, and consequences in a hypothesized causal chain linking individual and job-related resources to a series of organizational and individual outcomes via different forms of work-related experiences and attitudes. Following, for example, Lawler & Hall (1970), Figure 1 is based on the assumption that work-related experiences and attitudes are shaped in the interplay between the employee and situational factors in the work environment. Work-related experiences and attitudes can be construed as implicit, cognitive and emotional evaluations of the work situation, which again are considered to have an impact on organizational and individual outcomes, such as well-being, performance, and long-term health (cf. Harter, Schmidt, & Hayes, 2002; Schaufeli & Bakker 2004).

As stated above, the purpose of this report is to validate and assess the empirical utility of the concepts presented in Figure 1. The report is divided into two parts.

In the first part of the report we will investigate the psychometric properties of each of the instruments that we have for measuring the concepts presented in Figure 1 in order to assess the empirical validity of our measurements of positive work-related phenomena.

In the second part of the report we will assess the empirical utility of the concepts presented in Figure 1. This will be done in a series of partial analyses where aspects of Figure 1 will be investigated in order to test whether the hypothesized associations can be reproduced in Nordic survey-data from various organizational settings. The sum of the partial analyses that will be presented in part 2 of the report cover the associations contained in Figure 1 and the analyses will thus inform us on the viability of the insights of positive psychology in dealing with the above-mentioned challenges confronting the Nordic societies.

Finally, it must be mentioned that this is the second report of the Nordic project *Positive Factors at Work*, a Nordic collaborative project that has been supported by the Nordic Council of Ministers. The aim of the first report, *Positive Factors at Work. The First Report of the Nordic Project* (Christensen, 2008), was to present an overview of projects dealing with positive factors at work in the participating countries – Finland, Sweden, Norway, and Denmark – in order to develop a theoretical model for further research. In this second report we take our point of departure in this theoretical model in our assessments of the validity and utility of positive psychological concepts in a Nordic context. Before we move on to investigate the validity of our tools for measuring positive psychological phenomena we will provide a brief introduction to the concepts of reliability and validity.

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## 1.2 Reliability and validity of the instruments

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Information on the reliability and validity of a given instrument for measuring is crucial for evaluating its empirical applicability in the Nordic countries. The need for determining the reliability and validity of our measuring instruments and procedures is acute in psychological research. This is partly because contradictory findings in the field can be traced back to the applied methods. In this report we try to reach a clear understanding of the different concepts and their psychometric quality in relation to Nordic standards in the work environment. Some of the measures used have been developed by members of the Nordic group; however, most of the instruments were already validated measures which we wanted to test on Nordic work environments.

Validity refers to correctness or truth, and in our case it concerns whether we are measuring what we want to measure and whether there is a purpose behind taking the measurements. Test validation concerns the degree to which a test measures what it purports to measure (Liebert & Liebert, 1995). A very important indicator of good quality relates to content validity, which can be defined as the property of containing items directly sampled from the domain of interest. There is no certain recipe for a validation process. However, according to Hinkin (1998), the factor development process includes: (1) item generation, (2) questionnaire administration, (3) initial item reduction, (4) confirmatory factor analysis, (5) convergent/discriminant validity, and (6) replication.

It is important to be clear on what we want to measure, and this can be achieved by having clearly defined concepts. In the first phase of item generation the most important issue is *content validity*. The items used in the questionnaire should cover the different issues of the concept in question. The items may be taken from already validated scales or from factor analyses in prior pilot studies. Also, experts in the field could be asked to give evaluations of which aspects should be covered by the items of a

chosen concept. Using confirmatory analysis, hypotheses may be tested against existing hypotheses, and this may include the number and nature of factors. Regarding confirmatory analysis, it is believed that we know already what the measures mean, and we want to test propositions, such as whether the factor structure of a work engagement is the same in the Netherlands as it is in Finland.

Construct validity refers to validation of the interpretation or meaning of a theoretical construct. To test a construct, one could test hypotheses where one relates the construct to other constructs based on theories and empirical evidence. Convergent and discriminant validity are both considered to be subcategories of construct validity. Convergent validity refers to measures of constructs that theoretically should be related to each other, while discriminant validity refers to measures of constructs that theoretically should not be related to each other.

Reliability refers to the degree that a particular observation has yielded a replicable score. It can be increased by adding several similar items on a measure, by testing a diverse sample of individuals and by applying similar testing techniques (Shaugnessy, Zechmeister & Zechmeister, 2003).

Test-retest reliability is measured when studies are made at two different times with similar questions and subjects. The method can be used to generate information about the stability of an instrument and how it can predict future outcomes. The Cronbach's alpha coefficient is the most popular and widely used measure for reliability (or internal consistency). Cronbach's alpha is used to measure how well a set of items measures a latent construct.

The different studies presented in this report consist of both cross-sectional and longitudinal studies. Longitudinal studies are the most favoured method. However, most validation studies are conducted on cross-sectional studies due to lack of time and economic resources. The report will present definitions and the theoretical backgrounds of the different concepts. Further, comments will be made on the concepts' relevance to work life. This will be followed by a presentation of the methodology, in which the measures used will be described, and the results of distribution, internal consistency and stability will be reported along with factorial validity and construct validity.

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## 2. Validation

### 2.1 Work engagement (including job resources)

*Jari Hakanen*, Finnish Institute of Occupational Health

#### *2.1.1 Definition and theoretical background*

There are several ways to conceptualize and measure work engagement. For example, it has been defined in terms of (1) direct opposite of burn-out (Maslach & Leiter, 1997), (2) individual's involvement and satisfaction with as well as enthusiasm for work (Harter, Schmidt, & Hayes, 2002), and (3) being responsible for and committed to one's performance (Britt & Bliese, 2003). In addition, some of the earlier definitions of engagement did not differentiate the concept from job involvement or organizational commitment. Here, I focus on what perhaps is the most prominent conceptualization of engagement. Schaufeli and Bakker and their colleagues (Schaufeli, Salanova, González-Roma, & Bakker, 2002) define *work engagement* as a positive, fulfilling, cognitive, and affective state of mind that is characterized by vigor, dedication, and absorption. *Vigor* refers to high levels of energy and mental resilience while working, the willingness to invest effort in one's work, and persistence in the face of difficulties. *Dedication* refers to a sense of significance, enthusiasm, inspiration, pride, and challenge. The third dimension of engagement is *absorption*, which is characterized by being fully concentrated and happily engrossed in one's work, whereby time passes quickly.

According to the Job Demands-Resources (JD-R) model, two broad categories of work characteristics can be distinguished: job demands and job resources (Demerouti, Bakker, Nachreiner, & Schaufeli, 2001). In this project we focus on *job resources*, which refer to the physical, psychological, social, or organizational aspects of a job that may (1) reduce job demands and the associated physiological and psychological costs, (2) are functional in achieving work goals, and (3) stimulate personal growth, learning and development. Hence, job resources are not only necessary to deal with job demands and to "get things done", but they are also important in their own right. Work engagement has often been studied in context of the JD-R model, and such studies have shown that job resources are positively associated with work engagement and may even predict engagement in the long term (e.g. Hakanen, Schaufeli, & Ahola, 2008b; Mauno, Kinnunen, & Ruokolainen, 2007). Recent research has also shown that job resources and work engagement may mutually predict each other over time (Hakanen, Perhoniemi, & Toppinen-Tanner, 2008a).

### 2.1.2 Work life relevance

Well-being at work is an extensively discussed issue when considering present and future work life challenges. Work engagement adds to that discussion the truly positive dimension and it helps to address several important issues in developing healthy and flourishing workplaces, for example: What it is that makes a job inspiring, energizing and meaningful? How can flourishing and engagement be promoted among employees? What are the positive consequences of employee engagement? How prevalent are positive states at work in different jobs? Thus, investigating work engagement can be useful in identifying human resources and capacities and in using solution-oriented and resource-based approaches in organizations to improve the health, commitment, and performance of their employees. In addition, it helps to complement the rather black and white thinking in traditional occupational health psychology, which has mainly focused on risk factors and symptoms instead of human potentials and strengths.

Many work engagement studies have tested the Job Demands-Resources model, which is partly an extension of Karasek's Demand-Control model (DCM) (Karasek, 1979). The DCM states that job stress is particularly caused by the combination of high job demands (particularly work overload and time pressure) and low job control. Thus, the DCM focuses only on one type of job resource (job control). According to the JD-R model the category of job resources may include job control but in addition supervisor and colleague support, opportunities for professional development, feedback and appreciation, positive client contacts, job security, social and innovative climate, and many other resources, depending on the work situation and the work context. The importance of specific job resources may change in different organizational contexts and situations, and to a certain extent some job resources may perhaps compensate for the lack of other resources. Thus, the JD-R model, including job resources (and job demands), offers a realistic, positive, dynamic, and practical approach to developing work sites (Bakker & Demerouti, 2007; Hakanen, Bakker, & Schaufeli, 2006).

### 2.1.3 Method

*Work Engagement* is assessed with the Finnish version of the Utrecht Work Engagement Scale (UWES; Hakanen, in press). To date, the UWES has been translated into more than 20 languages, including Swedish, Norwegian, and Finnish, which may be downloaded on certain conditions from the website [www.schaufeli.com](http://www.schaufeli.com). The instrument includes three sub-scales; vigor, dedication, and absorption. *Vigor* is assessed with six items (e.g. "At my work, I feel bursting with energy"). *Dedication* is measured with five items (e.g. "I am enthusiastic about my job"). Finally, *Absorption* is assessed with six items (e.g. "I am immersed in my work"). Items are rated

on a seven-point scale ranging from “0 = never” to “6 = always”. Since the three dimensions are highly intercorrelated (especially vigor and dedication), the total engagement score has also been employed.

Based on the original 17-items version of the UWES, also a shortened 9-items version (comprising three items for each dimension) has been validated internationally in 10 countries (Schaufeli, Bakker, & Salanova, 2006). In addition, in a study employing five Finnish datasets, the 9-item version seems to show even better factorial validity than the longer version when considering factorial group invariance and factorial time invariance (Seppälä et al., in press).

Given that job resources can be measured with various instruments, including QPS-Nordic (Elo et al., 2001) and the Healthy Organization Barometer (Lindström, Hottinen, & Bredenberg, 2000), their psychometric properties are not described here. Job resources are also partly profession-specific, as the Finnish dentist study has shown (e.g. Hakanen et al., 2008a). However, this report includes (chapter 2.6 on values in organizations) validation of such measures as justice, and horizontal and vertical trust which are examples of job resources.

The following information on the psychometric properties of work engagement is based on three studies and six datasets: the teachers (N= 2038) and other educational staff at schools and in administration in Helsinki (N = 1327), Finnish dentists in 2003 (N = 3255) and 2006 (N = 2667), and finally Finnish cancer survivors (N = 591) and their referents in a general working population (N = 757). In addition, unless otherwise mentioned, the following results are based on the original 17-item version of the Finnish version of UWES.

#### *2.1.4 Distribution, internal consistency and stability*

Normal distribution of the engagement items is mainly within the acceptable limits for the kurtosis and the skewness. The values of kurtosis and skewness of one dedication item (“I find the work that I do full of meaning and purpose”) and in some samples also one absorption item (I feel happy when I am working intensely) have values above  $\pm 1.96$  and to some extent violate the normality assumptions in the Finnish data.

The values of Cronbach’s  $\alpha$  have been acceptable with the total work engagement scale (by averaging the scores of all 17 items on the three subscales to form one index of work engagement) ranging in the six Finnish datasets from 0.90 to 0.95. For the vigor subscale, the Cronbach’s  $\alpha$  has varied between 0.76 and 0.87, with dedication between 0.86 and 0.93, and with absorption between 0.81 and 0.90, respectively.

The three-year correlation between work engagement at T1 and at T2 was 0.73 among Finnish dentists whereas the test-retest correlation for

the sub-dimensions of engagement varied between 0.67 and 0.73, indicating a rather stable nature of engagement. Moreover, the error-free latent correlations in the dentist sample have been even higher (Seppälä et al., in press).

### 2.1.5 Factorial validity

The factorial validity of the UWES has been demonstrated (Schaufeli et al., 2002). In addition, the factorial validity of the Finnish version of the three-dimensional 17-item UWES has been indicated with Confirmatory Factor Analyses (CFA; Hakanen, 2002). As for the original 17-item instrument, it has been found in Scandinavian data and elsewhere that two items typically have somewhat low factor loadings on their respective factors, and therefore the modified version has included only 15 items. Moreover, the 9-item short measure of the UWES has been shown to indicate good factorial properties since its structure has been found to be group invariant and also time invariant (Seppälä et al., 2008). Employing the aforementioned Finnish datasets, Table 1 shows that the corrected 9-item version of the UWES has the best fit of different versions of the instrument that has been used in previous studies. In that model two error variances (between absorption items “*I am immersed in my work*” and “*I get carried away when I’m working*”) were allowed to correlate, which led to the improved model fit. Evidently, these items share some combined variance which the absorption factor cannot explain. The content of these two items is similar, measuring the feelings of being fully absorbed and deeply immersed in one’s work in contrast to the third item of absorption, which measures feelings of happiness while working intensely (Seppälä et al., 2008).

The factor loadings are shown in Figure 2. The figure shows that the correlations of the latent engagement variables are very high suggesting, together with the fit statistics of the one-dimensional solution (UWES-9<sub>tot</sub>), that the use of a one-dimensional work engagement scale may also be used.

**Table 1. The fit statistics for different versions of the three-dimensional UWES using the Finnish datasets (N = 7296)**

Model	$\chi^2$	df	GFI	CFI	NFI	RMSEA
UWES-17	8747.42	116	0.86	0.87	0.87	0.101
UWES-15	6820.43	87	0.88	0.90	0.89	0.103
UWES-9	2512.16	24	0.92	0.93	0.93	0.119
UWES-9 <sub>cor</sub>	1046.65	23	0.97	0.97	0.97	0.078
UWES-9 <sub>tot</sub>	1218.99	26	0.96	0.97	0.96	0.079

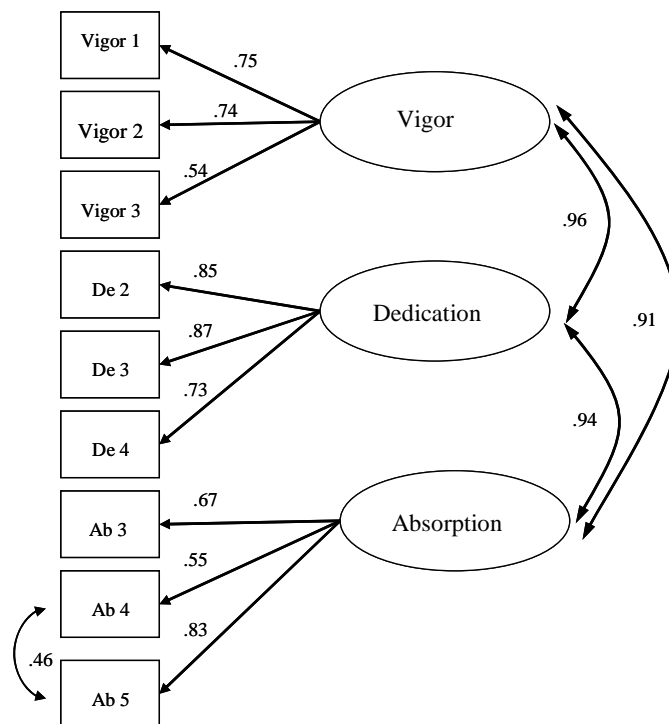


Figure 2. The factorial structure of the final model of UWES-9

### 2.1.6 Construct validity

#### a) Convergent validity

Work engagement has been associated with motivating and energizing aspects in work, i.e. job resources. It has also been positively related to personal resources, such as professional efficacy (e.g. Hakanen, 2002) and optimism (Hakanen & Lindbohm, 2008). In addition, engagement is related to commitment indicators, such as organizational commitment (Hakanen et al., 2006), and intention and willingness to continue in work life and not to retire (Hakanen & Perhoniemi, 2008), and to performance indicators, such as personal initiative (Hakanen et al., 2008a). Furthermore, work engagement seems to be positively associated with various indicators of health in Finnish and Swedish datasets (e.g. Hakanen, 2004; Hakanen et al., 2006; Hakanen & Lindbohm, 2008; Hallberg & Schaufeli, 2006; Parzefall & Hakanen, in press).

#### b) Discriminant validity

Examination of the relationships between work engagement and burnout with Confirmatory factor analysis (CFA) has confirmed that the two constructs are distinct although negatively related (Hakanen, 2002; Schaufeli et al., 2002). Work engagement and burnout seem to share about one-quarter to one-third of its variance with job burnout. However, the (reduced) professional efficacy dimension of burnout loads on the work

engagement factor, and one reason for this is that all efficacy items are positively worded, whereas exhaustion and cynicism consist of only negatively phrased items.

Work engagement is also distinct from workaholism. These two constructs are uncorrelated or only very moderately correlated. More specifically, absorption and workaholism ( $r = .18$ ) among Finnish dentists) seem to share some variance, whereas workaholism has not been correlated with vigor and dedication (e.g. Hakanen 2005; Schaufeli, Taris, & van Rhenen, 2008). Work engagement and workaholism also seem to have different antecedents and potential consequences. For example, among Finnish dentists work engagement was moderately negatively related to sickness presenteeism, whereas workaholism (and burnout) associated positively with presenteeism.

Finally, using a Swedish sample, Hallberg and Schaufeli (2006) showed that work engagement can be discriminated from job involvement and organizational commitment. This finding is important because some earlier studies have mixed items of commitment, involvement, and even engagement, and then labelled the construct as engagement. However, in their study by using a specific measure of work engagement (UWES) it was possible to show the distinctiveness of these constructs.

### *2.1.7 Conclusions*

Work engagement measured with either the 9- or 17-item Finnish version of the Utrecht Work Engagement Scale showed good psychometric qualities, for example as regards to internal consistency, and construct and predictive validity. The only critical comment concerns the factorial properties of the measure. Sometimes, the theoretically assumed three-dimensional structure was not confirmed and/or some additional error correlations needed to be freed in order to reach appropriate fit. However, in such cases and also without such structural imperfections it is always possible to use a one-dimensional total engagement scale. Evidently, work engagement is a highly promising construct, fulfilling a deep gap in the taxonomy of affective employee well-being/ill-being when it comes to high activation and pleasure, i.e. enthusiasm at work.

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## 2.2 Optimism

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### 2.2.1 Definition and theoretical background

To be an optimist indicates that the person expects good things to happen to him or her, while a pessimist expects the opposite (Carver & Scheier, 2002). The definitions of optimism and pessimism are based on expectations of the future, and thereby link it to the expectancy value models of motivation. There are two main ways to define optimism. Scheier and Carver (1985) define optimism and pessimism in terms of personality traits or dispositions. Dispositional optimism is the global expectation that good things will happen in the future, whereas dispositional pessimism is the global expectation that bad things will happen in the future. Goals are important in expectancy value theories, and it is assumed that our behaviour is targeted towards a goal. The more important a goal is, the greater the motivation will be to reach that goal. The other important aspect of this theory is the expectancy we have about the attainability of the goal, which is dependent very much on the confidence of the person concerned. Furthermore, whether one expects to attain the goal or not is dependent on one's confidence (Carver & Scheier, 2002). The second main way to define optimism is to use the concept of "explanatory style". This is the approach taken by Seligman (1991). The attribution and explanatory styles are important aspects of approach Seligman, 1998). He argues that each of us has our own "explanatory style", a way of thinking about the causes of things that happen in our lives. We develop our explanatory style during childhood and, unless deliberate steps are taken to change it, it will last our entire life. Seligman (1998), however, argues that optimism is an explanatory style, rather than

a broad personality trait. He proposes several programmes on how to learn to be more optimistic by changing people's explanatory styles.

### *2.2.2 Work life relevance*

Optimism is related to several work-related outcomes. Many researchers have found an association between optimism and high levels of career planning, effective problem solving, exploration, decision-making confidence, popularity, good health, and higher life satisfaction. On the other hand, high levels of pessimism have been found to be associated with career indecision, low achievement, low self-esteem, and more psychological distress (Caprara, 2005; Creed, Patton, & Bartrum, 2002; Peterson & Steen, 2002). Importantly, all of these elements are related to both well-being at work, and also to the performance of effective and productive work.

### *2.2.3 Methods*

Scheier and Carver (1985) developed a measure called the Life Orientation Test (LOT) to assess personal differences in both optimism and pessimism. A revised version of the measure was published in 1994 by Scheier, Carver and Bridges, called The Life Orientation Test – Revised (LOT-R). It consists of six coded items, of which three are coded in each direction. In addition, there are four filler questions. The measure focuses directly on expectations for the future.

### *2.2.4 Distribution, internal consistency, and stability*

In our studies, optimism was measured by six items from the Life Orientation Test – Revised (LOT-R) (Scheier et al., 1994), a measure of generalized optimism versus pessimism. The respondents indicated the extent of their agreement to each item using 5-point Likert scales ranging from (1) “strongly disagree” to (5) “strongly agree”. The four filler questions from the scale were left out. Two studies, one in Norway and one in Finland included optimism in their projects. The results from the Norwegian study of a banking organization in mid-Norway (N = 360) showed a normal distribution of optimism and pessimism. The Cronbach's alpha value for the whole scale (without the filler questions) was 0.76, for the single scale of optimism it was .60, and for the single scale of pessimism it was .74. Normal distribution of the optimism and pessimism items are all within the acceptable limits of  $\pm 1.96$  for the kurtosis and the skewness. The Finnish study (Hakanen & Lindbohm, 2008) also measured with the revised version of the Life Orientation Test (Scheier et al., 1994). In the Finnish study Cronbach's  $\alpha$ 's for optimism was 0.80 at time 1 and 0.75 at time 2, and for pessimism 0.74 at time 1 and 0.72 at time 2.

### 2.2.5 Factorial validity

The factorial validity of the LOT-R has been tested Confirmatory Factor Analyses using Amos 7.0. Table 2 shows that the two-factor model of LOT-R has a good model fit both for the Norwegian sample and for the Finnish sample. The results of the two-factor model in the Norwegian sample are shown in Figure 3 and the results of the Norwegian one factor model are shown in model 2. This shows that perhaps optimism and pessimism are related but separate dimensions; a person may be low in optimism without being a real pessimist. Also the Finnish sample confirmed that the two-factor model showed better fit than the one-factor model.

**Table 2. The fit statistics for LOT-R in the Norwegian (N = 360) and Finnish (N = 1851) datasets**

Model	$\chi^2$	df	GFI	CFI	NFI	RMSEA
Norwegian sample						
One-factor model	60.78	9	.94	.89	.87	.127
Two-factor model	18.8	8	.98	.97	.96	.061
Finnish sample						
One-factor model	377.65	6	.89	.85	.85	.175
Two-factor model	52.04	8	.99	.98	.98	.064

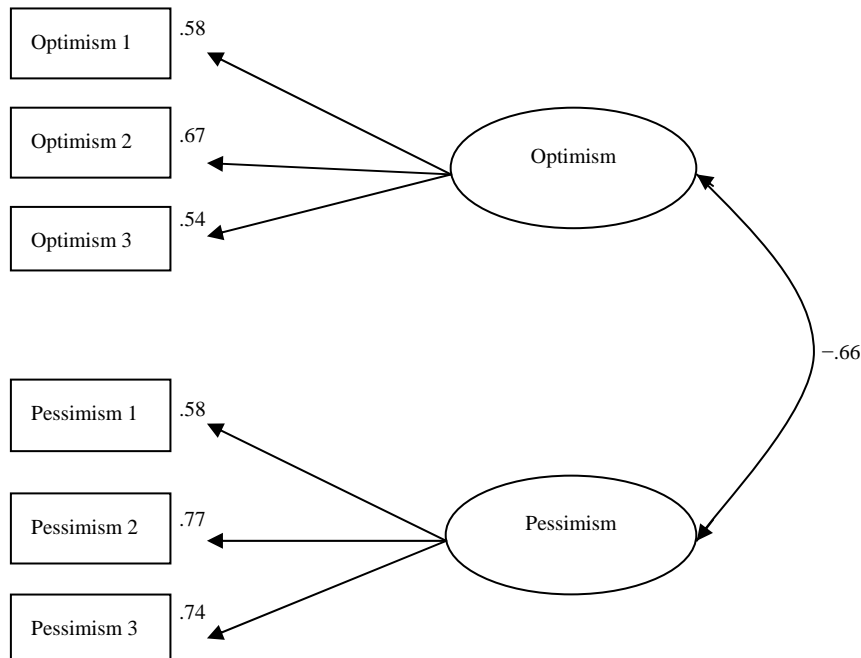


Figure 3. The factorial structure of the Norwegian two-factor model of LOT-R

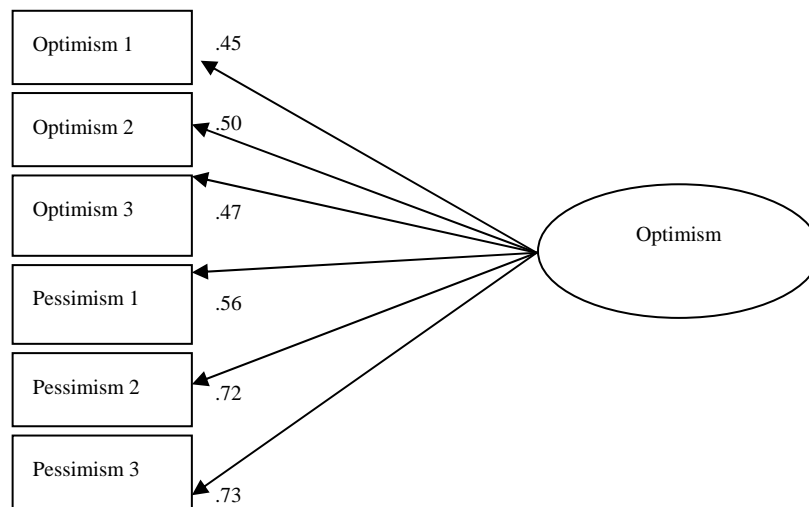


Figure 4. The factorial structure of the Norwegian one-factor model of LOT-R

### 2.2.6 Convergent validity

The intercorrelation between optimism and pessimism was 0.50 with a significance level of 0.01. Optimism was found to be strongly correlated with life satisfaction (0.50). In the Finnish data it was found that optimism was more strongly correlated with work engagement than pessimism, and more strongly among cancer survivors (0.47) than among their non-cancer referents (0.32). The intercorrelations between optimism and pessimism were 0.53 for cancer survivors and 0.47 for the referents.

### 2.2.7 Conclusions

Using both Norwegian and Finnish samples to validate the LOT-R, the conclusion is that the two-factor model of optimism had a good model fit, whereas the one-factor model did not have an acceptable model fit. Optimism was found to be strongly related to both engagement and life-satisfaction in the two Nordic samples.

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## 2.3 Flow – a positive experience

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### 2.3.1 Definition and theoretical background

First introduced by Csikszentmihalyi in 1975, the experience of flow refers to a subjective state reported by people being completely involved in the task at hand. The experience is accompanied by the merging of action and awareness, a sense of control, and an altered sense of time (Csikszentmihalyi, Abuhamdeh, & Nakamura, 2005). After conducting several studies, Csikszentmihalyi and colleagues restricted the empirical definition of flow to a Challenge-Skill Ratio. In this tradition, flow is operationalized to occur in any situation where there is balance between a person's skills and the perceived challenges, given that this balance is above an average level (Massimini & Carli, 1988). Empirically, other approaches to the flow experience exist and have been applied to measure the cause and effect of flow in a variety of situations (e.g. Jackson & Marsh 1996; Flow State Scale). In attempting to develop a work-related measure of flow, Bakker (2005; 2008) argues that the three dimensions absorption, enjoyment and intrinsic motivation seem to be reoccurring characteristics of the flow experience. Absorption is related to a state of total concentration, immersion, and altered time sense. Enjoyment refers to the cognitive and affective evaluations of the flow experience, and intrinsic motivation refers to the engagement in tasks due to the inherent pleasure and satisfaction experienced in the activity. Thus, Bakker (2005; 2008) defines flow as a short-term peak experience that is characterized by absorption, work enjoyment and intrinsic work motivation.

## Study 1

### *2.3.2 Sample and procedure*

Data for the Work-Related Flow scale (WOLF – see below) were collected as part of a larger project. Completed questionnaires were collected from employees in four organizations (56.3%) and from second year bachelor students (43.7%). Of 331 distributed questionnaires, 218 acceptable questionnaires were returned, giving a response rate of 66%. Of the participants, 51.1% had completed or were in the process of completing a three-year bachelor degree, and 30.3% had completed more than three years of studies. The average age of the respondents was 31.7 years ( $SD = 10.98$ ), and 84 were women.

*Flow* was measured by the Work-Related Flow inventory (Bakker, 2008). This questionnaire consists of 14 items and was used to measure how often participants had experienced absorption, enjoyment, and intrinsic motivation in their work during the preceding two weeks. The scale items are presented below in Table 3. Responses were rated on a Likert scale, ranging from 1 (never) to 7 (always).

**Table 3. Questionnaire items**

	Never						Always
	1	2	3	4	5	6	7
1. When I am working, I think about nothing else	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. I get carried away by my work	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. When I am working, I forget everything else around me	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. I am totally immersed in my work	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. My work gives me a good feeling	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. I do my work with a lot of enjoyment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. I feel happy during my work	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. I feel cheerful when I am working	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. I do my work simply for the pleasure that it brings me	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. I find that I also want to work in my free time	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. I work because I enjoy it	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12. When I am working on something, I am doing it for myself	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13. I would still do this work, even if I received less pay	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14. I get my motivation from the work itself, and not from the reward for it	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

The following statements refer to the way in which you experienced your work during the last two weeks. Please indicate how often you experienced each of the statements. (1 = never, 2 = almost never, 3 = sometimes, 4 = regularly, 5 = often, 6 = very often, 7 = always)

A dependent variable was also included to indicate the convergent validity of flow (see below). *Task performance* was measured by a 6-item scale (Kuvaas, 2006). Items included statements such as “I intentionally expend a great deal of effort in carrying out my job” and “I perform better than what can be expected of me”. Responses were rated on a Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree)

### 2.3.3 Distribution, internal consistency and stability

Normal distribution of the WOLF items is within the acceptable limits of  $\pm 1.96$  for the kurtosis and the skewness. Descriptive statistics, correlations, and Cronbach’s alphas of the three WOLF scales are presented in Table 4.

**Table 4. Descriptive statistics, correlations, and Cronbach’s alpha**

	<i>M</i>	<i>SD</i>	$\alpha$	1	2
1. WOLF, absorption	3.89	1.02	.77	-	
2. WOLF, enjoyment	4.71	1.18	.93	.58**	
3. WOLF, intrinsic motivation	4.03	1.16	.80	.52**	.69**

\*\* p < .01

### 2.3.4 Factorial validity

A Confirmatory Factor Analysis (CFA) using Lisrel 8.7 (Jöreskog & Sörbom, 1993) was applied in order to further test factor structures. Following the theoretical assumptions of Bakker (2008) it was tested for a three-factor solution. Following the general advice of reporting criteria for fit indices in organizational behaviour research (Diamantopoulos & Siguaw, 2000; Mathieu & Taylor, 2006; Medsker, Williams, & Holahan, 1994), the goodness of fit statistics reported are the chi-square/df ratio, comparative fit index (CFI), the goodness-of-fit index (GFI), the root mean square error of approximation (RMSEA), and the normed fit index (NFI).

The CFA supported a three-factor solution. However, the model revealed somewhat unsatisfactory fit indices ( $\chi^2 [74] = 326.57$ ; GFI = .83; CFI = .95; NFI = .93; RMSEA = .12). For NFI, values should be greater than .90 to indicate an acceptable fit. As can be seen in this case, the NFI indicates an acceptable fit. However, GFI values should have been somewhat higher in order to indicate an acceptable fit. In terms of CFI, values greater than .95 are considered as indicative of acceptable fit, which was just reached in the study. The value for RMSEA indicating good fit should be smaller than .05, and values between .05 and .08 indicate acceptable fit. With an RMSEA value of .12, the results of the study revealed an unacceptable fit. A ratio between chi-square and *df* of two and three is suggested to indicate a reasonable fit (Medsker et al., 1994). However, the results of the study indicate a ratio of 4.4, which does not meet the criteria of Medsker et al. (1994).

The factorial validity of the WOLF questionnaire is thus not fully supported in the present study. More research is recommended in order to evaluate its true properties.

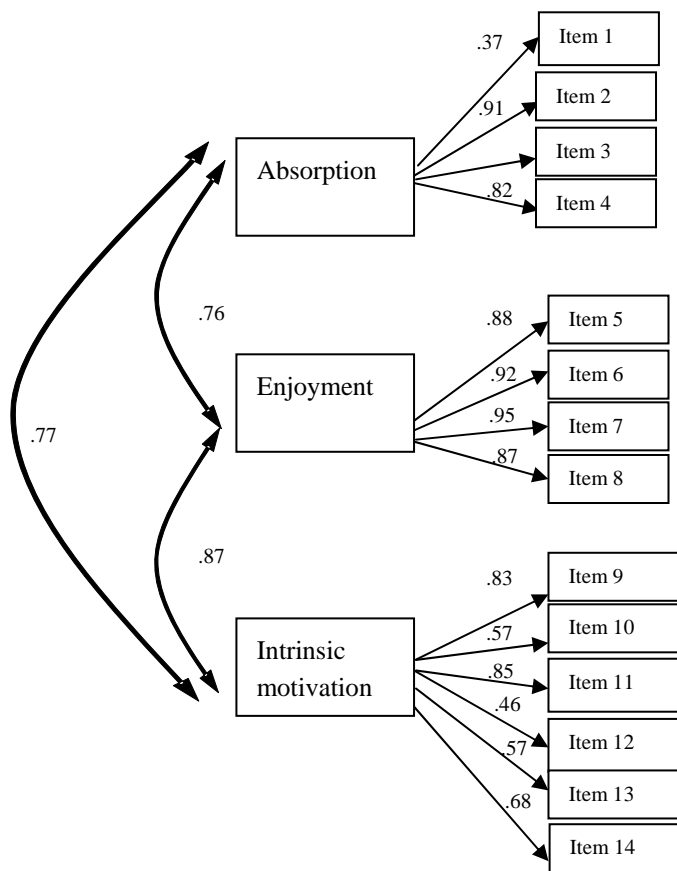


Figure 5. The factorial structure of WOLF

### 2.3.5 Construct validity

#### a) Convergent validity

Flow has previously been associated with personal and organizational resources, organizational spontaneity, task interest, and task performance (e.g. Csikszentmihalyi, 1975; Demerouti, 2006; Eisenberger, Jones, Stinglehamer, Shanock, & Randall, 2005; Salanova, Bakker, & Llorens, 2006). This study included a measure on performance, and preliminary results support the assumption of significant positive relationships between all three WOLF scales and performance (see Table 5).

**Table 5. Correlations**

	Performance
1. WOLF, absorption	.47**
2. WOLF, enjoyment	.50**
3. WOLF, intrinsic motivation	.38**

\*\* Correlation is significant at the 0.01 level

## b) Discriminant validity

Because the WOLF questionnaire is relatively new, rigorous attempts to demonstrate its discriminant validity have not as yet been made. However, a preliminary study by Kopperud (in press) suggests some challenges in discriminating the WOLF scale from the related scales of work engagement (UWES) and intrinsic work motivation (Kuvaas, 2006).

To the best of our knowledge, other attempts to empirically discriminate between flow and other related positive states of mind (such as engagement, intrinsic motivation, and passion) have not been made yet, and remain an important aim for future studies.

## Study 2

### 2.3.6 Sample and procedure

Data for the second study testing the Work-Related Flow scale (WOLF) were collected as a Web-based survey among employees from a banking group in Mid-Norway in 2007 (N = 360), with a response rate of 51%. The average age of the respondents was 50 years, 52% were women and 65% were men. A total of 65% of the sample had a higher level of education, categorized as either a college or university degree.

### 2.3.7 Measurement

*Flow* was measured by the Work-Related Flow inventory (Bakker, 2008). For details, see description in study 1.

*Job Performance.* To indicate convergent validity of flow, a measure of job performance was included as a dependent variable. *Job Performance* was measured by three items (Kuvaas, 2006;  $\alpha = .76$ ). The scale ranges from 1 (strongly disagree) to 5 (strongly agree).

*Work Engagement.* To test for discriminant validity, the 9-item version of the UWES (Utrecht Work Engagement Scale) was applied (Schaufeli, Salanova, González-Roma, & Bakker, 2002).

### 2.3.8 Distribution, internal consistency and stability

Descriptive statistics, correlations, and the Cronbach's alphas of the three WOLF subscales are presented in Table 6.

**Table 6. Descriptive statistics, correlations, and Cronbach's alphas**

	<i>M</i>	<i>SD</i>	$\alpha$	1	2
1. WOLF, absorption	4.39	0.98	80.	-	
2. WOLF, enjoyment	4.79	1.10	93.	.55**	
3. WOLF, intrinsic motivation	3.74	0.92	71.	.50**	.64**

\*\* p < .01

### 2.3.9 Factorial validity

A confirmatory factor analysis (CFA) using Amos was applied to test the three-dimensional factor structure as suggested by Bakker (2008) (i.e. absorption, intrinsic enjoyment and intrinsic motivation). The goodness of fit indices reported are the chi-square/df ratio, comparative fit index (CFI), the goodness-of-fit index (GFI), the root mean square error of approximation (RMSEA), and the normed fit index (NFI) (Diamantopoulos & Siguaw, 2000; Mathieu & Taylor, 2006; Medsker et al., 1994). The fit indices of the three-factor model of flow were not within the acceptable limit ( $\chi^2$  [74] = 407.09; GFI = .87; CFI = .90; NFI = .88; RMSEA = .10). It should be recalled that values should be greater than .90 for GFI, CFI and NFI to indicate an acceptable fit, and the RMSEA should be lower than .08 for acceptable fit and .05 for a good fit. Several of the factor loadings were also below acceptable limits (See Table 6). The structure of the WOLF is thus not supported in the present study, and more research is needed in order to further adapt the measure. A possible explanation of the misfit between the scale and the data may be explained by how the items are framed. Although intrinsic motivation and absorption may be important parts of the flow experience, the items are post-evaluative and directed towards a general tendency of having the experience. Because the scale does not link the items to a specific experience of being in flow, its true nature may be hard to detect. Furthermore, the balance between challenges and skills preferable could be included in order to capture the essence of the flow experience.

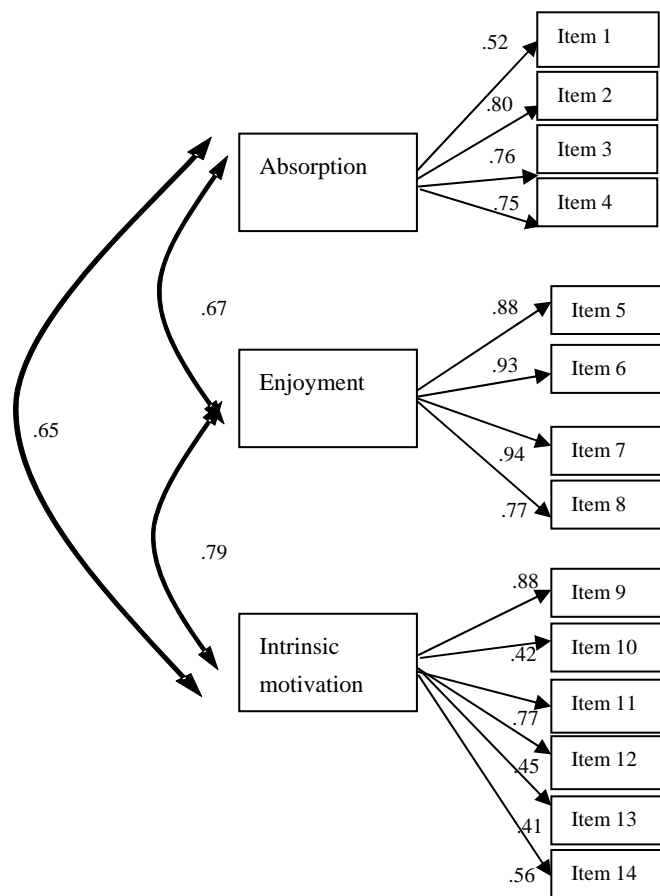


Figure 6. The factorial structure of WOLF

### 2.3.10 Construct validity

#### a) Convergent validity

Flow has been applied both as a predictor and an outcome of various motivational processes (Csikszentmihalyi & Csikszentmihalyi, 1988; Kowal & Fortier, 1999; Straume, 2008). The present study included job performance, and preliminary results support the assumption that flow, as measured by the three dimensions of the WOLF, may be positively related to performance (see Table 7).

**Table 7. Correlations**

	Performance
1. WOLF, absorption	.31**
2. WOLF, enjoyment	.32**
3. WOLF, intrinsic motivation	.25**

\*\* Correlation is significant at the 0.01 level

#### b) Discriminant validity

In order to test discriminant validity, WOLF was correlated with the UWES (Utrecht Work Engagement Scale) (see Table 8). Considering the

high correlations, it is possible that the WOLF scale represents some redundancy problems with the UWES. For more details on this issue, see Kopperud (in press).

**Table 8. Correlations**

	Vigor	Dedication	Absorption	UWES total
WOLF, absorption	.47**	.53**	.65**	
WOLF, intrinsic enjoyment	.70**	.73**	.65**	
WOLF, intrinsic motivation	.56**	.61**	.61**	
WOLF total scale				.77**

\*\* Correlation is significant at the 0.01 level

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## 2.4 Positive well-being and depression

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### *2.4.1 Definition and theoretical background*

In recent years positive well-being and positive affect have been regarded as the same as absence of mental illness, or as though positive mental health and mental illness are interrelated, but separate concepts (Keyes, 2005; Keyes & Grzywacz, 2005). Mental illness has been described by different symptoms, and several validated measures exist. One such strength is the Major Depression Inventory (MDI) (Bech, Rasmussen, Olsen, Noerholm, & Abildgaard, 2001; Olsen, Mortensen, & Bech, 2004).

There have been few attempts to describe the concept of positive mental health. One of these is SF-36, which defines different dimensions of self-rated health. One of the scales used is the Mental Health Scale (Ware, Jr. et al., 1998), yet this scale is a mix of some positive states and some negative states. In contrast to the intention this method builds on the very common assumption that mental health and mental illness are just the opposite ends of the same dimension. In contrast to this viewpoint the World Health Organization has proposed another measure (Bech, Olsen, Kjoller, & Rasmussen, 2003), which builds on the assumption that positive mental health is different from the absence of mental illness. Positive mental health has been defined by the presence of some positive states: positive affects, positive attitudes towards oneself and towards other people, capacity to manage complex environments, interests in social life, etc. The WHO Well Being Scale captures some of these positive states. The aim of this paper is to investigate the discriminant validity of the MDI and WHO Well Being Scales for the use in the work environment research.

#### *2.4.2 Work life relevance*

Mental illnesses play an important role in work life. People with clinical depression are normally incapable of working and they are often excluded from the labour market. There is some evidence that risk factors in the work environment are higher than the risk of depressive moods in the work environment (Rugulies, 2002; Rugulies, Bultmann, Aust, & Burr, 2006). However, the problem is that this maybe is only the top of the iceberg. Possibly, people with low mental healthy but without a mental illness also in some degree are incapable of working, and maybe there are some interactions between mental health and work environment factors that determine later mental illness and exclusion from the labour market. Furthermore, we lack knowledge about different risk factors for mental health and mental illness.

#### *2.4.3 Methods*

Depression and depressive mood are measured by the MDI Scale, which consists of 12 items covering the common symptoms of depression. Examples of the items are “Have you felt low in spirits or sad?” and “Have you lost interest in your daily activities?” The scale can be used as a continuous scale, but there exist different ways to define operationally major and minor depression.

Positive mental health is measured by the WHO Well Being Scale, which consists of five items: 1. I have felt cheerful and in good spirits. 2. I have felt calm and relaxed, 3. I have felt active and vigorous, 4. I woke up feeling fresh and rested, 5. My daily life has been filled with things that interest me.

The following information about the psychometric properties is based on baseline (2004–2005) and the first follow-up study (2006) in the project SOSU (Work Environment and Health in the Danish Care for Elderly) (N = 9949)

#### *2.4.4 Distribution, internal consistency and stability*

Results from the SOSU baseline study showed that the MDI Scale had a very skewed distribution towards the low end. The skewness was 1.89 and the kurtosis was 5.05. The MDI Scale seemed to violate the normality assumption.

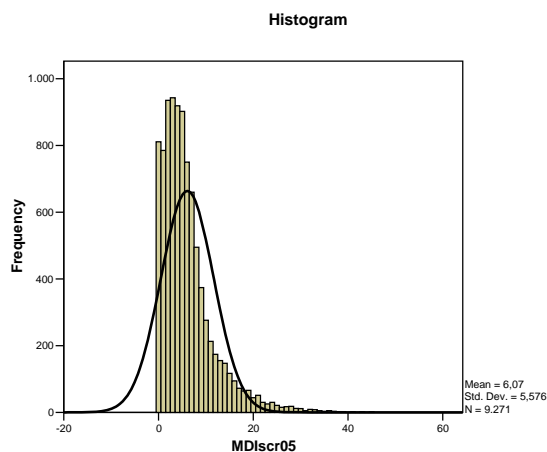


Figure 7. Distribution of the MDI scores

The MDI scale had a very high internal consistency (Cronbach's alpha = 0.87). Some data was generated on the stability, but has not been analysed yet. The distribution of the Well Being Scale showed that the values had almost normal distribution. The skewness was  $-1.05$  and the kurtosis was  $1.08$ . The internal consistency of this scale was also high (Cronbach's alpha = 0.87).

#### 2.4.5 Factorial validity

The exploratory factor analyses showed that for each scale one latent factor explained a large amount of the variance. For the depression scale this scale explained 46% of the total variance and for the well-being scale it explained 65% of the total variance.

For the depression scale there were some differences between the loadings on the latent factors, from 0.46 to 0.64, which indicates that there may be some problems with this scale. For the well-being scale the items loaded on the latent factor in very high degree, from 0.72 to 0.86.

#### 2.4.6 Discriminant validity

A confirmatory factor analysis shows that a one-factor solution did not fit the data well (high Chi-square = 9206,  $df = 90$  and high RMSEA = .101). The assumed two-factor solution was much better, but still not very good (Chi-square = 5623,  $df = 89$ , RMSEA = .079). The correlation between the two latent factors was high ( $r = -0.82$ ). The CFA indicated that positive well-being and depression are two separate but highly correlated factors.

The explanation for the only moderate fit of the assumed two factor solution seemed to be that two of the depression items were inversed positive: lack of energy and lack of interest in life. We tried to modify the

CFA and removed the two overlapping factors. This solution resulted in an even better fit with the data (Chi-square = 3180, df = 64, RMSEA = .070). The correlation between the two latent factors was a little lower, but still high ( $r = -0.78$ ).

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## 2.5 Intention to leave or stay

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### 2.5.1 Definition and theoretical background

Intention to leave or stay is defined as thoughts and plans for staying in the present workplace or to leave by taking early retirement or a job in another workplace.

### 2.5.2 Work life relevance

Turnover and early retirement is a very important issue for a society, and its employers and employees. The shortage of labour is associated with costs for the society and the employers and has been a strong motive for investigating the causes. Turnover can be described as a process in which dissatisfaction with the work environment is one of the first steps, followed by intention to leave which ultimately can result in actual turnover or early retirement. Hence, for the employees, turnover and early retirement is assumed to be an indicator of poor quality of work. The strongest predictor of turnover has been the intention to leave or stay at the workplace. This makes it possible to use intention to stay or leave as a proxy for actual staying or leaving. Further, it is important to study factors associated with these intention in order to increase opportunities early in the process for preventing actual turnover and early retirement.

### 2.5.3 Method

The question “How likely is it that within five years you will stay at your present workplace?” was assumed to be an adequate way of operationalizing *intention to stay or leave*. The five response alternatives were “very likely”, “fairly likely”, “maybe”, “not very likely”, and “not at all likely”.

The following information about the psychometric properties is based on baseline (2004–2005) and the first follow-up study (2006) in the project SOSU (Work Environment and Health in the Danish Care for Elderly) (N = 9949)

### 2.5.4 Distribution, internal consistency and stability

The distributions of the answers to the question mentioned above are shown in Table 9. They seem to be good, without floor and roof effects. The stability between the two rounds is relatively high,  $r = 0.56$ ,  $N = 6201$ .

**Table 9. Distribution of answers 2004–2005 and 2006**

	Distribution 2004–2005	Distribution 2006
very likely	13.3	14.2
fairly likely	24.4	23.6
maybe	37.0	32.5
not very likely	13.6	14.3
not at all likely	11.7	15.4

### 2.5.5 Factorial validity

Usually it is recommended to use scales with multiple items to measure psychological concepts. There are several reasons for such recommendations. First, it is not possible to estimate the internal reliability of a single-item measure with the normal method. Secondly, the increased use of structural equation modelling will required estimation of error variance.

In the present study we used a single-item scale. There are both practical and research related reasons for the use of a single-item scale. First, we wanted a questionnaire that was as short as possible to get a high response rate. Another reason is that the question we chose is supposed to have good face validity. However, it is important to make an estimation of the reliability of single-item measures in order to correct for the attenuation of effect sizes which happens in studies with single-item scales.

As far as we know there is no study of the question about how good a single-item measure of the concept intention to stay or leave is. In the related area of job satisfaction, a meta-analysis of the correlation between a single item about general job satisfaction and multiple-items measure of job satisfaction were found to be between 0.70 and 0.80 (Wanous, Reichers, & Hudy, 1997). Accordingly, we recommend the use of an estimated error of 0.75 when using structural equation modelling.

### 2.5.6 Construct validity

We tested the predictive value of the single item scale by looking for the correlation between the answers in the baseline and the work status by the first follow-up study 1½ years later (Table 10). The higher intention to stay is at baseline the higher is the remaining in the same workplace and the higher the intention to leave is an increasing number of the employees leave the workplace 1½ years later.

**Table 10. Association between intention to leave or stay in 2004–2005 and the actual work status at follow-up in 2006 (N = 7433).**

	Status after 1½ years (%)		
	At the same workplace	Another workplace	Out of work
very likely (5)	95.6	2.5	1.9
fairly likely (4)	95.2	3.6	1.1
Maybe (3)	88.1	8.1	3.7
not very likely (2)	74.5	14.9	10.6
not at all likely (1)	52.1	11.2	36.7
Total	84.9	7.5	7.6

### 2.5.7 Conclusion

The analyses in this section show that the chosen single item to indicate intention to stay or leave the workplace has high validity. Thus, it will be

appropriate to use this single item as a proxy for turnover in studies if it is not possible to obtain information about actual turnover.

## References

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## 2.6 Values in organization

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### *2.6.1 Definition and theoretical background*

In the last decade there has been increasing interest in the role which values play in organizations. This interest indicates that values in organizations have an important impact on employees' well-being and productivity. There is evidence that some central values in organization are supportive of well-being and job performance. In this respect, values such as justice, trust and social responsibility have been studied the most. Employees seem to have some agreement about how much they can trust their respective organizations and how they perceive justice in the organizations. This agreement can be interpreted as an indication of certain characteristics of the particular organization.

### *2.6.2 Work life relevance*

In a meta-analysis of 190 studies it was found that perception of justice was associated with two organizational outcomes: job performance and counterproductive work behaviour (Cohen-Charash & Spector, 2001; Colquitt, Conlon, Wesson, Porter, & Ng, 2001). Also individual outcomes such as job satisfaction and organizational commitment were associated especially with procedural justice.

### *2.6.3 Method*

Each of the value dimensions were measured by scale with three or four items as described in Table 11. Each item had five answer categories.

**Table 11. Items in the scales for measuring Values.**

Scale for "horizontal trust":	Do the employees withhold information from each other? (To a very large extent (Reversed scoring) Do the employees withhold information from the management? (To a very large ...) (Reversed scoring) Do the employees in general trust each other? (To a very large ...) 3-, 4-, 5- or 6-point scale?
Scale characteristics:	Correlation with the original trust scale with 9 items: 0.79. Non-responders: 113. Average: 68.6. SD: 16.9. Cronbach's alpha: 0.77. Item correlations with total scale: 0.48–0.69. Inter-item correlations: 0.41–0.68.
Scale for "vertical trust":	Does the management trust the employees to do their work well? (To a very large ...) Can you trust the information that comes from the management? (To a very large ...) Does the management withhold important information from the employees? (To a very large ...) (Reversed scoring) Are the employees able to express their views and feelings? (To a very large ...)
Scale characteristics:	Correlation with the original scale for trust with 9 items: 0.93. Non-responders: 87. Average: 67.0. SD: 17.7. Cronbach's alpha = 0.80. Item correlations with the total scale: 0.55–0.69. Inter-item correlations: 0.40–0.56.  The two scales for trust have a correlation of 0.57, which confirms that they do not measure the same thing.
Justice and respect:	These items were under the same heading on the top of the page as the items on trust.  Are conflicts resolved in a fair way? (To a very large ...) Are employees appreciated when they have done a good job? (To a very large ...) Are all suggestions from employees treated seriously by the management? (To a very large ...) Is the work distributed fairly? (To a very large ...)
Scale characteristics:	Correlation with the original scale of 9 items: 0.95. Non-responders: 93. Average: 59.2. SD: 17.7. Cronbach's alpha = 0.83. Item correlations with total scale: 0.61–0.72. Inter-item correlations: 0.48–0.66.
Inclusiveness, the social responsibility:	Same heading as the items on trust and justice.
Scale for social responsibility:	Are men and women treated equally at your workplace? (To a very large ...) Is there space for employees of a different race and religion? (To a very large ...) Is there space for elderly employees? (To a very large ...) Is there space for employees with various illnesses or disabilities? (To a very large ...)
Scale characteristics:	Correlation with the total scale of 7 items: 0.91. Non-responders: 99. Average: 67.5. SD: 16.3. Cronbach's alpha: 0.63. Item correlations with total scale: 0.35–0.45. Inter-item correlations: 0.21–0.41.

The following information about the psychometric properties is based on two Danish studies: The Danish Psychosocial Work Environment Study 2004 (N = 3074)

### 2.6.4 Distribution, internal consistency and stability

We found the distributions of both scales to be approximately normal, as the skewness and kurtosis for the scales are near to zero (Table 12).

**Table 12. Psychometric properties of the scales for measurement of Values in Organizations**

	Trust vertical	Trust horizontal	Social responsibility (7 items)	Justice (9 items)
N	3094	3094	3094	3094
Minimum	0	0	0	0
Maximum	100	100	100	100
Mean	66.9	68.6	67.9	61.7
Std. Deviation	17.1	16.9	15.1	17.0
Skewness	-0.50	-0.26	-0.32	-0.39
Kurtosis	0.48	0.05	0.36	0.34
Cronbach's $\alpha$	0.87	0.77	0.78	0.92

The Cronbach's alphas show that both scales have acceptable internal consistency. Information about stability is not yet available.

### 2.6.5 Factorial validity

The CFA analyses show that it is not appropriate to establish one scale on the basis of all 19 items. A one-factor solution does not show acceptable values on several fit indices (see Table 13). It is more appropriate to use the original three scales. Some of the modification indices point to the possibility of dividing the scale of trust into two: a scale for Vertical trust to measure the degree of trust between the management and employees, and a scale to measure the degree of mutual trust among employees. The analysis of this four-factor solution shows a better fit to the data. On the basis of these analyses we decided to create four scales to measure values in organizations.

**Table 13. Factor loadings and fit measures**

	Range of factor loadings	$\chi^2$	df	RMSEA	CFI	GFI	AGFI	NFI
1 factor, 19 items	0.32–0.86	7772.13	275	0.094	0.97	0.83	0.80	0.96
3 factors, 7, 7, and 5 items	0.41–0.86	6369.75	272	0.085	0.97	0.86	0.83	0.97
4 factors	0.47–0.88	4931.04	269	0.075	0.98	0.89	0.86	0.98

The results of the mutual correlation of the four scales are shown in Table 14. All of the correlations are strong. Especially the correlation between justice and vertical trust is very high, which indicates that there is a very close relationship between employees' perception of justice and their trust in the leadership.

**Table 14. Correlations between the four scales**

	Trust vertical	Trust horizontal	Justice (9 items)	Social responsibility (7 items)
Trust vertical		0.57 0.00	0.88 0.00	0.67 0.00
Trust horizontal	0.57 0.00		0.59 0.00	0.41 0.00
Justice	0.88 0.00	0.59 0.00		0.69 0.00
Social responsibility	0.67 0.00	0.41 0.00	0.69 0.00	

### 2.6.6 Construct validity

We expect that the four values are associated with leadership quality and that the correlation of vertical trust and justice with leadership are higher than the correlations of the two values. The two hypotheses are confirmed (Table 15), which we interpret as an indication of the validity of the four scales.

**Table 15. Correlations between leadership and the four scales**

	Quality of leadership (8 items)
Trust vertical	.703**
Trust horizontal	.464**
Justice	.780**
Social responsibility	.439**

\*\* Correlation is significant at the 0.01 level

## References

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## 2.7 Organizational commitment and meaning at work

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### 2.7.1 Definition and theoretical background

Employee identification with work tasks and with the work organization must be considered crucial when investigating positive factors at work. In the following we direct our attention towards an analysis of the psychometric properties of two scales gauging the concepts of organizational commitment and meaning at work.

The concept of *organizational commitment* has been the subject of numerous studies. Meyer & Allen (1997) distinguish between three types of organizational commitment – affective, normative and continuance commitment – that in different ways tie the individual to an organization. In this context we are primarily interested in the concept of affective organizational commitment.

The concept of *meaning at work* describes the subjective sense that people make of their work (Wrzeniewski, 2003). According to Pratt & Ashforth (2003) individuals experience meaning at work when the work roles and work context are considered purposeful and significant, and thus are in congruence with central aspects of individual identity.

### 2.7.2 Work life relevance

According to Fredrickson's Broaden-and-Build Theory concurrent experiences of positive affect have a positive long-lasting impact on individual adaptability, creativity, resilience, and well-being (Fredrickson, 2001; 2003).

High levels of affective organizational commitment and experiences of meaning at work can thus be construed as concurrent experiences of work-related positive affect that in turn will have a bearing on the quality of the working life of the individual.

In the literature, organizational commitment has been associated with increased well-being, organizational citizenship behaviour, increased job performance, retention, and lower absenteeism (cf. Meyer & Allen, 1997: 25ff). Furthermore, the experience of meaning at work has been found to have a positive impact on psychological well-being (Arnold, Turner, Barling, Kelloway, & McKee, 2007).

### 2.7.3 How we measure the concepts

Two scales measuring *meaning at work* and *organizational commitment* have been developed as part of the Copenhagen Psychosocial Question-

naire (COPSOQ). COPSOQ is a survey instrument that has been constructed for measuring several dimensions of psychosocial work environment and well-being (cf. Kristensen, Hannerz, Hoegh, & Borg, 2005).

The items that make up these scales are shown in Table 16. The items suggest that the COPSOQ-operationalization of the two scales measure two distinct dimensions of work identification. The *meaning at work* scale appears to measure respondents' identification with their actual work tasks, whereas the *organizational commitment* scale appears to tap into respondents' identification with the work organization.<sup>1</sup> In the study, the individual items were measured using a 5-point Likert scale ranging from "1 = To a very low extent" to "5 = To a very high extent".

**Table 16. Items in the scales for measuring Meaning at work and Organizational commitment in English and Danish (original language of the scales)**

Scale of Meaning at work	Skala for mening i arbejdet
Are your work tasks meaningful?	Er dine arbejdsopgaver meningsfulde?
Do you feel motivated and engaged in your work?	Føler du dig motiveret og engageret i dit arbejde?
Do you feel that you do an important job at work?	Føler du, at du yder en vigtig arbejdsindsats?
Scale of Organizational commitment	Skala for involvering i arbejdspladsen
Do you enjoy telling other people about your workplace?	Nyder du at fortælle om din arbejdsplads til andre mennesker?
Would you recommend a good friend to apply for a job at your workplace?	Ville du anbefale en god ven at søge en stilling på din arbejdsplads?
How often do you think about looking for another job? (reversed)	Hvor ofte tænker du på at søge arbejde et andet sted? (reversed)
Do you think that your workplace is of great personal significance to you?	Synes du, at din arbejdsplads har stor personlig betydning for dig?

The following analyses of the psychometric properties of the scales measuring meaning at work- and organizational commitment are based on the project Work Environment and Health in the Danish Care for Elderly. Data were collected through mailed questionnaires in 2005 (N = 9.949) and 2006 (N = 10.065) and the follow-up period ranged from 18 to 22 months (cf. Borg 2008).

#### 2.7.4 Distribution, internal consistency and stability

Table 17 shows the psychometric properties of the two scales under investigation. It is apparent from the Table that the *meaning at work* scale

<sup>1</sup> The concepts of *organizational commitment* and *meaning at work* were originally operationalized in the COPSOQ questionnaire bearing the scale names *meaning of work* and *involvement in the workplace* (cf. Kristensen et al., 2005). The scale measuring *involvement in the workplace* is conceptually similar to the concept of affective organizational commitment, so in order to align ourselves with the international literature in that area we decided to rename the scale *organizational commitment*. Also, we find the label *meaning at work* to be more precise than the original scale name of "*meaning of work*" and accordingly we have renamed that scale from the original COPSOQ name.

has a mean value of 77.8 and the *organizational commitment* scale has a mean value of 60.8. This implies that both scales are skewed to the right, and accordingly, they are not normally distributed around the centre of the scale (50). This point is also illustrated by the skewness indices in the Table that show that the *meaning at work* scale is particularly skewed. Table 17 furthermore shows that the Cronbach's alpha values are *c.*0.7 on both scales which implies a satisfactory level of internal consistency between the items that constitute the two scales.

The cross-lagged correlation between *meaning at work* and *organizational commitment* was 0.53 and 0.60 respectively, which indicates that experiences of *meaning at work* and *organizational commitment* are relatively stable over time – at least when measured amongst the staff in the elderly care sector in Denmark.

**Table 17. Psychometric properties of the scales for measurement of Meaning at work and Organizational commitment**

	Meaning at work	Organizational commitment
N	9.834	9.842
Minimum	0	0
Maximum	100	100
Mean	77.8	60.8
Std. Deviation	14.0	19.3
Skewness	-0.43	-0.36
Kurtosis	0.57	-0.13
Cronbach's alpha	0.70	0.75
Cross-lagged correlation	0.53	0.60

### 2.7.5 Factorial validity

In order to investigate whether the data fit a one- or two-dimensional model of identification with work we conducted a confirmatory factor analysis (CFA) on the seven items that constitute the two original scales from the COPSOQ-questionnaire.

The CFA-analyses show that it is not appropriate to establish one scale comprising all seven items. The fit-measures in Table 18 shows that the original two scales with respectively three and four items provide a better fit for the data than the one-factor model. All of the fit indices show that the two-factor solution is superior to the one-factor solution. The modification indices of the two-factor analysis indicate that the two scales could be even better if we let one of the items (Do you feel motivated and engaged in your work?) load on both latent factors, thus yielding a two factor solution with three and five items. The analysis with this factor solution showed an even better fit of the two scales.

**Table 18. Factor loadings and fit-measures**

	Range of factor loadings	$\chi^2$	DF	RMSEA	CFI	GFI	AGFI	NFI	Latent factor correlations
1 factor, 7 items	0.30–0.79	2304.47	14	0.14	0.92	0.93	0.86	0.92	
2 factors, 3 and 4 items	0.34–0.86	1331.79	13	0.11	0.95	0.96	0.91	0.95	0.78
2 factors, 3 and 5 items	0.57–0.74	609.95	12	0.07	0.98	0.98	0.96	0.98	0.54

Thus, the CFA analyses showed that it makes sense to distinguish between employee identification with the work tasks and identification with work organization as the results showed that a two-factor solution provided a better fit of the data compared to the one-factor solution – even though the item structure of the best fitting model differed from the item structure proposed in the original COPSOQ scales. However, despite these results, the remainder of the analyses will take their point of departure in the original COPSOQ scales.

### 2.7.6 Construct validity

The construct validity of experiences of *meaning at work* and *organizational commitment* were tested in a series of bivariate correlation tests. The available data also contain scales measuring the following indicators of psychosocial work environment exposures: emotional demands, demands to hide emotions, work pace, quantitative demands, influence at work, possibilities for development, quality of care, group participation, quality of leadership, predictability, role clarity, and role conflicts.

Organizational commitment correlated significantly with all of the abovementioned indicators of psychosocial work environment exposures ( $p < 0.0001$ ) and meaning at work also correlated with the cited psychosocial work environment exposures ( $p < 0.0001$ ) except quantitative demands ( $p = 0.1457$ ).

Other unpublished results from prospective multivariate multilevel analyses corroborate the construct validity of the two scales, as they are differentially related to the abovementioned psychosocial exposure variables when adjusting for demographic, tenure and job function.

When analysed on data from the Work Environment and Health in the Danish Care for Elderly study the construct validity of the *meaning at work* and *organizational commitment* is assured.

### 2.7.7 Discriminant validity

The confirmatory factor analysis showed that the scales of *meaning at work* and *organizational commitment* measure unique phenomena. This finding is substantiated in a bivariate correlation test that shows that the

two scales are strongly correlated (Pearson's  $r = 0.54$ ), albeit redundant variance also remains in both scales.

Furthermore, the data from the Work Environment and Health in the Danish Care for Elderly study also contain scales measuring self-efficacy, well-being and burnout. As these measures also tap into the psychological stature of the individual they constitute valid referents in an analysis of the discriminatory validity of the two scales that we are investigating.

A correlation analysis revealed that *meaning at work* is positively correlated with self-efficacy and well-being and negatively correlated with burnout. All correlations are moderately strong, which assures the discriminant validity of the *meaning at work* scale when compared to conceptually similar constructs.

A separate correlation analysis revealed that *organizational commitment* is positively correlated with self-efficacy and well-being and negatively correlated with burnout. The correlation between *organizational commitment* and self-efficacy is weak and the other correlations are moderately strong. The analyses thus show that the *organizational commitment* scale can be discriminated from conceptually similar constructs.

### 2.7.8 Conclusions

The analyses showed that *organizational commitment* and experience of *meaning at work* – in the COPSOQ operationalizations of meaning at work and organizational commitment – can be viewed as two distinct scales that measure different dimensions of work identification as the two scales passed the tests associated with factorial, discriminant and construct validity.

The concepts are highly relevant to positive psychology as they contribute to enhancing the quality of working life in contemporary organizations. It is important to note, however, that the results of these analyses are based on survey data from employees in the Danish elderly care sector, which means that the results are not necessarily generalizable to other professions and business sectors.

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## 2.8 Validation of self-rated recovery items against morning salivary cortisol

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The complete study is reported in “Relationships between self-rating of recovery from work and morning salivary cortisol” (Gustafsson, Lindfors, Aronsson, & Lundberg, 2008).

### 2.8.1 Theoretical background

To describe the associations between physiology and recovery, reliable methods to measure rest and recovery are needed. One of the most common methods to gain information on rest and recovery is to ask people to provide self-ratings in questionnaires. To determine whether the answers to such questions are associated with health, self-ratings can be evaluated with respect to established biomarkers of physiological functioning, such as cortisol.

Rest and recovery are fundamental to the allostatic load model that describes how the bodily systems strive to achieve stability and adaptation through change (McEwen, 1998). According to the allostatic load model, health-related problems can result from a too-high or too-frequently recurring physiological activation, or from an inability to shut off physiological activation when the stress exposure has ended. This means that recurring and long-term stress-related activation of various physiological systems, without any possibility for recovery, adds to the wear and tear of the body’s resources thereby increasing the risk for future health problems (McEwen, 1998). With respect to recovery from work, incomplete or insufficient re-

covery has been associated with an increased risk for allostatic load (von Thiele, Lindfors, & Lundberg, 2006).

This study is part of a larger project, with the overall aim to study modern working life in which people must themselves regulate their working hours and assume responsibility for their work (Allvin, Aronsson, Hagström, Johansson, & Lundberg, 2006).

### *2.8.2 Participants and procedure*

Data came from 12 female and 13 male healthy white-collar workers aged between 24 and 62 years. The data were analysed by linear regression analyses and variance analysis (ANOVA repeated measurement). The participants were part of a group of 169 employees of a government authority who were invited to participate in a study. Prior to the sampling of salivary cortisol, all participants completed a questionnaire that, in addition to other questions, asked for details on demographic information and rest and recovery (for details, see Lindfors, 2002a; 2002b). Measurements of salivary cortisol were carried out individually on two working days according to oral and written instructions from the investigators.

### *2.8.3 Rest and recovery from work*

Using a self-report measure of 15 questions of rest and recovery from work, the present study set out to investigate the predictive value of each item on salivary cortisol. Drawing on previous research (Sluiter, Frings-Dresen, van der Beek, & Meijman, 2001), poor rest and recovery were hypothesized to be associated with higher levels of morning cortisol.

The items were formulated to describe rest and recovery from work in terms of feelings of rest, recovery and fatigue, problems sleeping, work-related worry, and discomfort. These questions have been used in several previous studies (Aronsson & Gustafsson, 2005; Aronsson & Lindh, 2004; Aronsson, Svensson, & Gustafsson, 2003; von Thiele et al., 2006). Internal consistency (Cronbach's alpha) for all 15 rest and recovery items included in this study was 0.85.

### *2.8.4 Statistical analyses*

Using linear regression analysis adjusting for sex and age, the associations between self-ratings and cortisol were quantified and used to predict cortisol values in pmol/ml for each of the items. In addition, self-ratings for each item were used to dichotomize the sample into groups of recovered and non-recovered individuals. This categorization was used in repeated measures ANOVA (parameter estimates, t-tests), to analyse the average value differences in salivary cortisol levels for each item.

### 2.8.5 Results

Table 19 shows the regression coefficients (Beta) from linear regression between self-ratings of rest and recovery items and morning cortisol at the first two points in time. The strength of the coefficient decrease by length of recovery period (“rested in the morning”, “rested after a weekend”, “rested after a mid-long absence”, and “rested after vacation”). On the item “rested after vacation”, 21 participants answered that they were very often or quite often rested, which implies that almost all participants had recovered: only four participants reported clear recovery difficulties after taking a vacation. The small variation in recovery after a vacation means that the testing of this particular item in the present study can be called into question. In comparison with morning cortisol, the regression coefficients for the rest and recovery items and cortisol for other points in time during the day were considerably weaker and had lower significance levels.

Table 19 also shows self-ratings of the six significant items in relation to cortisol ( $p < .01$ ). For age, there was only a small effect on the association between “worry about something” and morning cortisol, while none of the analyses showed significant interaction effects with age. For two items (“rested after a weekend” and “worry about something”) an interaction with sex emerged for morning cortisol. While the women’s self-ratings of recovery predicted cortisol level, the men’s self-ratings did not. This is in line with previous research showing that women’s stress levels tend to increase after work and during the weekend (Lundberg, 2005; Lundberg & Hellström, 2002). The present findings may reflect the fact that the weekend – as seen in terms of rest and recovery – is experienced differently by women and men. However, this hypothesis needs to be tested in larger samples.

**Table 19. Results of linear regression of 15 questions on rest and recovery on cortisol at two points in time in the morning. Regression coefficients (Beta) show the change in cortisol level (pmol/ml) for each scale position.**

Item	Rest and recovery questions	Morning cortisol	
		15–30 mins after waking	09:00
		Beta	Beta
	Recovered/rested		
E6 <sup>a</sup>	Do you feel thoroughly rested when you start working in the morning?	1.8**	1.5**
E11 <sup>a</sup>	Do you feel rested and recovered when you return to work after a weekend?	2.7/-0.8 <sup>#</sup>	1.4*
E12 <sup>a</sup>	Do you feel rested and recovered when you return to work after a medium-long absence (e.g. long weekend, short vacation)?	1.2	1.4*
E13 <sup>a</sup>	Do you feel rested and recovered when you return to work after several weeks' leave from work or vacation?	-0.3	0.9
	Fatigue		
E8 <sup>a</sup>	Do you feel energetic during a working day?	3.7**	2.9**
E7 <sup>a</sup>	Do you feel very tired during the working day?	3.0**	2.2**
E10 <sup>a</sup>	Do you experience mental fatigue after a working day?	-1.3	-1.0
E9 <sup>a</sup>	Do you experience physical fatigue after a working day?	0.1	-0.1
	Sleep problems		
E17 <sup>b</sup>	Upon waking during the past week, how often have you felt that you have had sufficient sleep?	2.6**	1.8*
E16 <sup>c</sup>	During the past week, have you had difficulties sleeping (difficulties falling asleep, waking too early due to work) because work-related thoughts have kept you awake?	0.7	0.3
E14 <sup>a</sup>	During the past three months, have you had difficulties sleeping because work-related thoughts have kept you awake?	0.1	-0.1
E 19 <sup>d</sup>	How many hours a night do you normally sleep?	-0.2	-0.6
E18 <sup>e</sup>	How well do you normally sleep?	-0.1	-0.5
	Worry/discomfort		
E144B <sup>f</sup>	I often worry about something.	4.1/1.2 <sup>#</sup>	1.7**
E15 <sup>g</sup>	Do you sometimes feel uneasy on your way to work?	1.2	1.2*

\*  $p < 0.05$ ; \*\*  $p < 0.01$

<sup>#</sup> Interaction effect with sex ( $p < 0.05$ ) beta coefficients (women/men).

a. Very often (1), Quite often (2), Sometimes (3), Seldom (4), Never (5). Question E7 was reversed in the statistical analysis.

b. No mornings (1), Some mornings (2), Most mornings (3), All mornings (4). The item was reversed in the statistical analysis.

c. Not at all (1), One night (2), Some nights (3), Every night (4).

d. Number of hours.

e. Very poorly (1), Quite poorly (2), Varies (3), Quite well (4), Very well (5).

f. Scale from 1 to 5: Disagree completely (1), Agree completely (5).

g. Not at all (1), Seldom (2), A few days per month (3), One day per week (4), A couple of days per week (5), Every day (6).

The results of the regression analyses showed that high levels of cortisol in the morning were associated with insufficient recovery. After dichotomization of scores on the 15 items, two distinct groups emerged: the “recovered” and “non-recovered” groups. The recovered group had lower levels of salivary cortisol than the non-recovered group, with this pattern being repeated across all 15 items. Variance analysis showed significant ( $p < 0.01$ ) results for morning cortisol (15–30 minutes after waking) for the following six items: “rested in the morning”, “rested after a weekend”, “feel energetic during the working day”, “tired during the working day”, “sufficient sleep”, “feel uneasy on your way to work”, and “worry about something”.

### 2.8.6 *The reliability of recovery questions*

The test-retest reliability ( $R_{tt}$ ) has also been computed for all 15 recovery items (the retests were performed five to seven weeks after the first testing occasion). The participants were a group of occupational health and safety personnel (nurses, safety engineers, etc.,  $N = 154$ ) on further education training courses (Gustafsson & Aronsson, unpublished study). In that study the reliability of the six items that had high validity in relation to cortisol and varied between 0.51 (“Do you feel energetic during a working day?”) and 0.74 (“Do you feel thoroughly rested when you start working in the morning?”). Test-retest reliability for the item “recovered after vacation” was 0.58.

### 2.8.7 *Concluding comments*

To conclude, the findings show that self-ratings of rest and recovery are related to cortisol, particularly to morning cortisol, and that self-ratings provide important information on physiological recovery in terms of cortisol output. The result was based on a small group of white-collar workers and this may reduce the possibilities of generalizing the results to other groups of employees. However, studying such a healthy homogeneous group reduces the influence from confounding factors. Although the study included a smaller group, the statistical power was maximized by the solid design, which involved repeated measurements with each participant providing 12 saliva samples across two days. However, the conclusions concerning the causal directions between rest and recovery and cortisol output are, of course, limited due to the cross-sectional study design. To sum up, we conclude that – albeit with certain reservations pertaining to homogeneity of the sample – a number of the questionnaire items on rest and recovery from work predict physiological recovery in terms of cortisol output.

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## 2.9 Relationship between a long-term health measure and self-rated health and symptoms in the Swedish working population

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### 2.9.1 Purpose of the study

The purpose of the study was to construct a measure of good long-term health based on sickness absenteeism (SA)/sickness presenteeism (SP) and to investigate its relationship to self-rated health and self-reported symptoms (Aronsson & Gustafsson, 2002; 2005; Aronsson, Gustafsson, & Dallner, 2000; Aronsson, Gustafsson, & Mellner, 2009).

### 2.9.2 Sample

The analyses were performed on data from three Swedish projects with representative samples but with some differences in the subjects' age and type of employment.

#### Sample 1:

*Burnout in Sweden* (see Hallsten, Bellaagh, & Gustafsson, 2002). The total study group consisted of a representative sample based on a questionnaire supplementing Sweden's series of regular labour-market sur-

veys supplementing Statistics Sweden's series of regular labour market surveys (Arbetskraftsundersökningen). Data were gathered on two separate occasions. The first questionnaire was administered in the autumn of 2000 (Time 1), and was responded to by 4997 persons, giving a response rate of 68%. On follow-up during the autumn of 2001 the response rate was 86%. The most recent analysis was restricted to people in full-time paid employment and in the age range 20–65 years on both occasions of questionnaire administration. The final group for analysis was reduced somewhat further due to attrition with regard to the study's outcome variable, representing a combination of sickness absenteeism and sickness presenteeism, i.e. between Time 1 and Time 2, which gave 2297 individuals for the analysis (see also Aronsson & Lindh, 2004).

#### Sample 2:

*Working life cohort.* The second set of data was collected in 2004 by the National Institute of Working Life in Sweden (NIWL). The study group consisted of a random sample of 2767 employees, aged 25–50 years. The response rate was 59% (Berntson et al., 2005).

#### Sample 3:

*Boundaryless work.* The third study group consisted of a random sample of employees (N = 1889), aged 21–64, with response rate 63%, and data collected in 2005 (Allvin, Aronsson, Augustsson, & Mellner, in prep.).

### 2.9.3 Variables

The long-term health outcome measure was created by combining sickness presenteeism (measured in number of occasions) and sickness absenteeism (measured in days). Since a limited amount of sickness presence is not at all uncommon, we included subjects who had been present when sick on just one occasion a year among those with long-term good health. The long-term health measure was based on two items on sickness presence and absence.

#### Sickness presence

Has it happened over the previous 12 months that you have gone to work despite feeling that you really should have taken sick leave due to your state of health?

Five-point response scale: (1) Not relevant, haven't been sick over the previous 12 months; (2) No, never; (3) Yes, once, (4) Yes, 2–5 times, (5) Yes, more than 5 five times.

#### Days of sickness absence

How many days in total have you been away from work and on reported sick leave over the previous 12 months? Five-point response scale: None

(1); Fewer than 6 days (2), 6–10 days (3); 11–23 days (4), More than 24 days (5).

The operationalization of *good long-term health* was little different in the three samples because of differences in scales and distributions.

*Burnout in Sweden.* Individuals who had at most one occasion of sickness presence per year and at most one occasion of sickness absence (of a maximum of five days) per year.

*Working life cohort.* Individuals who had at most one occasion of sickness presence per year and no days of sickness absence per year.

*Boundaryless work.* Individuals who had no occasion of sickness presence per year (or had not been sick over the previous 12 months) and no days of sickness absence per year.

*Self-rated health.* Measured by the question “How do you rate your general state of health?” Responses were given on a five-point scale: (1) Good, (2) Rather good, (3) Variable, (4) Rather poor, (5) Poor.

#### 2.9.4 Statistical analysis

In the analyses we combined and dichotomized the presence and absence variables and this resulted in one long-term good health group and three other groups with different profiles. Because the outcome measure (long-term health) consisted of only one item no conventional psychometric tests could be carried out. Instead, we investigated the relationship between the measure of long-term health and self-rated health and some illness symptoms by comparing the proportion with good health (rested, few symptoms) in our four categories.

#### 2.9.5 Results

Tables 20–22 show clear relationships between long-term health and self-ratings of health and investigated self-reported symptoms. There are differences in the absolute level of self-rated health in the three datasets, but these may be ascribed to differences in the rating scales and distributions. The most interesting result is that the rank for the three sets of data is the same. Of the two intermediate categories, the group with high sickness presenteeism/low sickness absenteeism seems to have a somewhat more problematic health situation than the group with low sickness presenteeism/high sickness absenteeism. In order to test the stability of this rank order we divided the “Burnout in Sweden” data into seven broad occupational groups and the same rank was reproduced and the results were the same in relation to sex and age.

*Symptoms.* The same rank order between the four groups appears in relation to the investigated symptoms and recovery variables with one exception – the item where people were asked whether they thought they had more resistance to becoming sick than other people (Table 21). That

question was used only in one of the studies, so it is difficult to know whether result is random or stands for something more substantial.

There is a very systematic relationship between our long-term health measure and self-rated health. However, not all people in our long-term health category rated themselves as having a high level of health. This may reflect that sickness absence is a relational variable, which means that it also contains the relationship between an individual's state of health and job demands. In that group, probably their ill-health did not constitute a functional obstacle in relation to their tasks and therefore did not result in absence.

**Table 20. Associations between the various combinations of sickness absenteeism (SA)/sickness presenteeism (SP) and general state of health, muscle and joint complaints, and stomach complaints (based on Burnout in Sweden 2001, N = 2234) (percentage distribution)**

	Low SP/Low SA (N = 820)	Low SP/High SA (N = 200)	High SP/Low SA (N = 772)	High SP/High SA (N = 442)
Self-rated health <sup>1</sup>	57	34	26	12
- pain in muscles/joints <sup>2</sup>	14	28	34	51
- stomach complaint <sup>2</sup>	6	11	19	27

<sup>1</sup> Good/rather good <sup>2</sup> Several days a week

**Table 21. Associations between the various combinations of sickness absenteeism (SA)/sickness presenteeism (SP) and general state of health, recovery and fatigue (based on Boundaryless work 2005, N = 1871) (percentage distribution)**

	Low SP/ Low SA (N = 352)	Low SP/ High SA (N = 374)	High SP/ Low SA (N = 343)	High SP/ High SA (N = 787)
Self-rated health <sup>1</sup>	85	77	74	62
Health compared with others <sup>2</sup>	83	71	68	62
Clearly more difficult/harder to become sick than others	52	33	49	30
Rested in the morning <sup>3</sup>	75	67	56	44
Rested after a weekend <sup>3</sup>	84	80	70	60
Tired during the working day <sup>3</sup>	4	10	12	21
Feel energetic during a working day <sup>3</sup>	71	59	52	45

<sup>1</sup> Very good/good, <sup>2</sup> Good/rather good, <sup>3</sup> Very often/often

**Table 22. Associations between the various combinations of sickness absenteeism (SA)/sickness presenteeism (SP) and general state of health, recovery and fatigue (based on Working Life cohort 2004, N = 2276) (percentage distribution)**

	Low SP/Low SA (N = 491)	Low SP/High SA (N = 622)	High SP/Low SA (N = 237)	High SP/High SA (N = 926)
Self rated health <sup>1</sup>	95	90	84	75
Rested in the morning <sup>2</sup>	60	57	43	37
Tired and listless <sup>2</sup>	12	17	34	36
Sufficiently relaxed/rested <sup>2</sup>	60	59	42	38
Alert and rested <sup>3</sup>	52	43	29	24

<sup>1</sup> Very good/rather good, <sup>2</sup> Every day/Several days a week, <sup>3</sup> All the time/often

### 2.9.6 Some concluding comments

A first question concerns the criteria for long-term good health, which is the outcome of decisions about cut points in the sickness presence and sickness absence variables. Depending on those criteria one can end up with a very small group of people in excellent good health (cf. Machenbach, van den Bos, Joung, van den Mheen, & Stronks, 1994, who created a category of excellent health, which consisted of 8% of the population) or one can have a larger group with good health, as in our study. Further empirical studies may contribute to reveal advantages and disadvantages with different approaches. A second question concerns the use of a single item for measuring sickness presence and long-term health. This sickness presence measure is based on the number of times present when sick. A first development step is to introduce a question which also measures the number of days working when ill. For both measures, test-retest should be carried out with systematic variation in the length of the retrospectively rated period.

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## 3. Test of working model

### 3.1 Do engaged employees perform better at work? The motivating power of job resources and work engagement on future job performance.

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#### *3.1.1 Introduction*

Previous studies on the relationships between well-being at work and performance typically have examined the associations between burnout and job performance. However, according to Schaufeli and Enzmann (1998: 85–93) the existing few studies have shown that self-rated performance has correlated weakly with different dimensions of burnout and that with other-rated or objectively measured performance indicators the results are even more inconsistent and disappointing. More recently, in a critical review of 16 studies, Taris (2006) found that the meta-analytical correlations between exhaustion and different indicators of job performance were, as expected, negative. Also in the present review the evidence for the relationships between performance and two other dimensions of burnout (depersonalization and reduced personal accomplishment) was inconclusive.

With the emergence of positive work psychology and concepts such as work engagement, research on employee well-being and job performance is fast becoming a salient research topic. For example, in an outstanding study among 342 Spanish contact employees from 114 service units in hotels and restaurants, Salanova, Agut, and Peiró (2005) found that organizational resources and work engagement predicted service climate, which in turn predicted employee performance, and furthermore customer loyalty. Also in a study among Dutch employees (N = 2164) by Schaufeli, Taris, and Bakker (2006), work engagement was positively associated with different aspects of job performance. Moreover, using different operationalization of work engagement and based on 7939 business units, Harter, Schmidt, and Hayes (2002) found positive relationships between unit-level employee engagement and business-unit outcomes, such as customer satisfaction, productivity, profit, employee turnover, and accidents. The authors concluded that the relationships were large enough to have sufficiently extensive practical value for the organizations. Finally, Bakker, Demerouti, and Verbeke (2004) used the comprehensive Job Demand-Resources (JD-R) model to examine in-role and

extra-role job performance among Dutch employees (N = 146). They found that the disengagement component of burnout mediated the impact of job resources on extra-role performance. In addition, job demands predicted positively and directly and at the same time also negatively and indirectly via exhaustion in role performance. Finally, in that study job resources also negatively predicted exhaustion. The final model explained 8% of the variance of both indicators of performance.

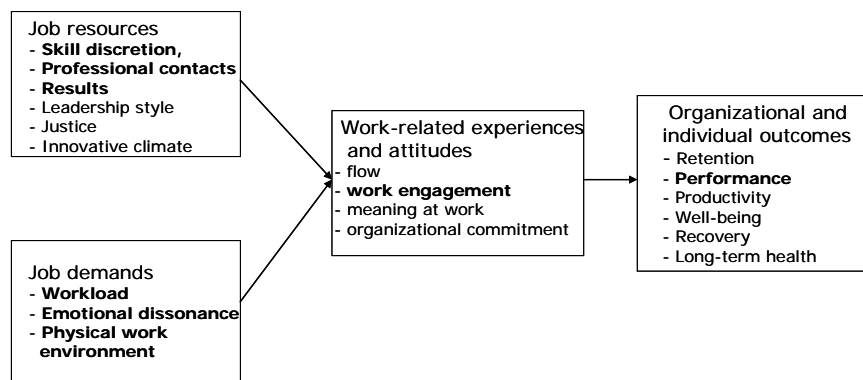


Figure 8. The focus and the variables of this sub-study

### 3.1.2 The present study

The present sub-study applied the JD-R model to investigate the positive processes influencing job performance (Figure 8). According to the JD-R model, two sets of working conditions may evoke two psychologically different, although related, processes (Demerouti, Bakker, Nachreiner, & Schaufeli, 2001; Schaufeli & Bakker, 2004): (1) an energy-sapping, health impairment process in which high job demands exhaust employees' mental and physical resources and may lead to burnout, and eventually to ill-health; and (2) a positive motivational process in which job resources foster engagement and positive outcomes, such as organizational commitment. In this study I first focused on the motivational process to investigate whether job resources would, through engagement, predict job performance (indicated by in-role performance, extra-role performance, and personal initiative). According to a recent review (Hakanen & Roodt, in press), most studies using the JD-R model to predict performance focus on the motivational process. Therefore, I further tested the model by including also job demands.

In contrast to Bakker et al.'s (2004) study which used colleague-rated measures on a heterogeneous, relatively small sample, the present study used self-rated performance measures in a homogenous, large sample of dentists. The dentist study also used a half-longitudinal design (predictors measured at T1 and the outcomes at T2). Moreover, work engagement (not the disengagement dimension of burnout) was measured in this study. Finally, I did not differentiate between performance measures but

instead investigated the overall performance as indicated by three aspects of performance.

Based on the working model (Figure 8) and the JD-R model, the following was hypothesized: (1) job resources via engagement would positively impact job performance; (2) this motivational process holds true even after adding job demands to the model; (3) the association between job resources and engagement is stronger than the association between job demands and engagement; and (4) the direct effect of job resources on performance is stronger than the corresponding impact of job demands on performance.

### 3.1.3 Participants

In 2003, a questionnaire survey was sent to every dentist who was a member of the Finnish Dental Association (N = 4588). In total, 3255 (71%) dentists responded to the questionnaire at the baseline, and 2555 of those identified (84%) participated in the follow-up three years later, in 2006. Of the follow-up respondents, 62% were employed in the public sector, while 38% worked in the private sector; 73.5% were women and 26.5% were men. The participants in the follow-up study still accounted for 57% of the whole profession in Finland. The respondents at T1 and T2 did not differ from the non-respondents at T2 with respect to the level of work engagement.

### 3.1.4 Measures

Three job resources were measured: *skill discretion* by Karasek (1979; six items;  $\alpha = .73$ ), and two scales by Gorter, te Brake, Eijkman, and Hoogstraten, (2006), i.e. *professional contacts* (four items;  $\alpha = .75$ ) and *long-term and immediate results* ( $\alpha = .87$ ).

Three job demands were included: *quantitative workload* (Karasek, 1979; three items;  $\alpha = .78$ ), *physical environment* (e.g. Hakanen, Bakker, & Demerouti, 2005; eight items;  $\alpha = .79$ ), and *emotional dissonance*, developed by Zapf, Vogt, Seifert, Mertini, and Isic (1999; four items,  $\alpha = .86$ ).

Work engagement was measured with the two core dimensions in the UWES, i.e. *vigor* and *dedication* (for details, see chapter 2.1).

Finally, job performance was measured with three scales: *in-role performance* (nine items,  $\alpha = .89$ ) and *extra-role performance* by Goodman and Svyantek (1999; seven items,  $\alpha = .86$ ), and a shortened version of *personal initiative* by Frese, Fay, Hilburger, Leng, and Tag (1997; four items,  $\alpha = .75$ ).

### 3.1.5 Results

Structural equation modelling was employed to investigate the hypothesized relationships. The fully mediated model in which work engagement mediated the effect of job resources on job performance fitted well with the data. However, a partially mediated model which also included a direct path from job resources to job performance fitted the data better than the fully mediated model ( $\Delta\chi^2 = 10.40$ ,  $\Delta df = 1$ ,  $p < .001$ ). Hence, job resources at T1 both directly and indirectly via engagement at T1 predicted job performance three years later (Figure 9).

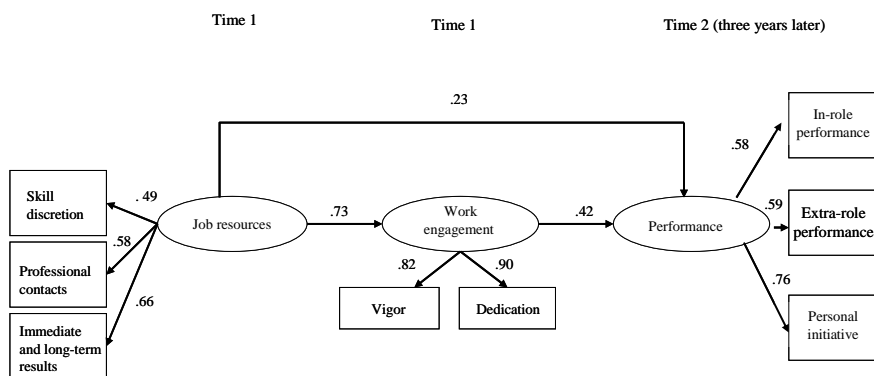


Figure 9. The best fitting partially mediated model with significant path coefficients  $\chi^2 = 221.21$ ;  $df = 17$ ;  $GFI = .96$ ;  $CFI = .93$ ;  $NFI = .93$ ;  $RMSEA = .094$

In the next step, job demands were added to the model. First, the fully mediated model again fitted appropriately with the data: job resources positively and job demands negatively influenced work engagement, which in turn positively impacted job performance. Second, comparing the fully and partially mediated models showed that, again, the partially mediated model fitted better with the data ( $\Delta\chi^2 = 25.03$ ,  $\Delta df = 2$ ,  $p < .001$ ). The results of this final model are shown in Figure 10. Even after adding job demands to the model, job resources influenced future job performance both directly and indirectly through work engagement. In addition, job demands also predicted job performance directly and indirectly via engagement, albeit negatively. Moreover, inspecting critical ratios for differences showed that job resources were more strongly related to engagement than job demands were (critical ratio for differences between the two parameters =  $-19.14$ ,  $p < .001$ ). Also the direct effect of job resources on performance was stronger than the corresponding effect of job demands (critical ratio for differences between the two parameters =  $-4.79$ ,  $p < .001$ ). Finally, the explained variances of job performance were 36% for the model not including job demands, and 41% for the model including both job resources and demands.

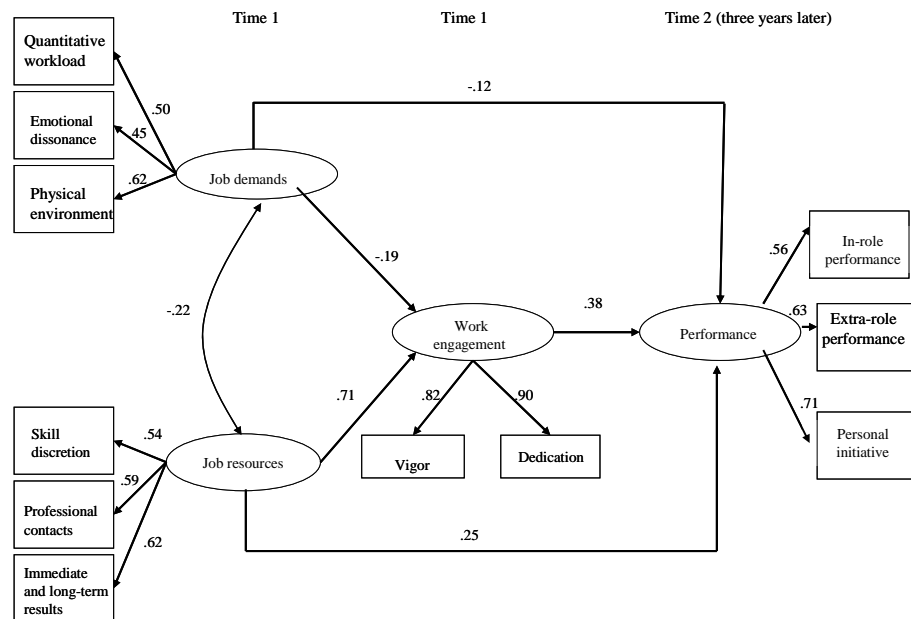


Figure 10. The best fitting partially mediated model including job demands with significant path coefficients  $\chi^2 = 565.23$ ;  $df = 38$ ;  $GFI = .95$ ;  $CFI = .91$ ;  $NFI = .90$ ;  $RMSEA = .079$

### 3.1.6 Summary

This sub-study supports our project's working model and the JD-R model. Previous studies that have used the comprehensive JD-R model have shown that the model can predict somatic health problems (Hakanen, Bakker, & Schaufeli, 2006; Schaufeli & Bakker, 2004), mental health (Hakanen, Schaufeli, & Ahola, 2008b; Parzefall & Hakanen, in press), turnover intention (Schaufeli & Bakker, 2004), and organizational commitment (Hakanen et al., 2006; Hakanen, Perhoniemi, & Toppinen-Tanner, 2008a), and in one study that used dimensions of burnout as mediators, also performance (Bakker et al., 2004).

The main finding of the present study was that job resources positively predicted engagement, which in turn positively influenced job performance over time. In addition, job resources had a direct impact on future performance. Furthermore, although also job demands negatively influenced engagement and job performance, these associations were weaker than the associations between job resources, engagement and job performance. This study also showed that true well-being at work – engagement – may have a considerable role in job performance.

In the study, three specific aspects of performance were combined into one global measure of job performance: (1) in-role performance – role-prescribed activities that contribute to formal task requirements and directly serve the goals of the organization (Goodman & Svyantek, 1999), (2) extra-role performance – altruistic and other not so formally pre-

scribed activities that support the organizational, social, and psychological work environment and that are based on employee predisposition and volition (Goodman & Svyantek, 1999); and (3) personal initiative (PI), that refers to active and initiative-taking behaviour that goes beyond the formal requirements at work. More specifically, PI is 1) consistent with the organization's mission, 2) has long-term focus, 3) is goal directed and action oriented, 4) is persistent when facing barriers or setbacks, and 5) is self-starting and proactive (Frese et al., 1997). As a characteristic, PI is positively associated with performing well in both formal and informal tasks (Fay & Frese, 2001). In previous studies the associations between well-being and performance have typically been rather weak, especially when global (and not specific) performance has been investigated (Demerouti & Bakker, 2006). For this reason, Demerouti and Bakker (2006) suggest that studies should use specific rather than global indicators of performance. In the present study, however, positive factors alone (including engagement) explained 36% of the variance of global performance. If other-rated or objective measures of performance had been used, the explained variances undoubtedly would have been smaller. To compare the results between global versus specific indicators of performance I also conducted post hoc analyses separately with different aspects of performance. The results confirmed that positive factors at work predicted all three aspects of job performance: in-role and extra-role performance, and PI. However, job demands only predicted in-role performance when separate analyses for each performance indicator were conducted. Thus, this finding further underlines the robustness of the association between positive factors at work and performance.

### *3.1.7 Conclusions*

This study supports our working model, showing that positive factors at work may have an important role in comprehensive job performance. Moreover, this role seems to be more important than the hindrance role of “negative” factors. In order to maintain and promote excellent levels of job performance it is salient for organizations to focus on job resources available to employees and when necessary improve them, and thereby foster employee engagement, commitment, and high-quality performance.

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## 3.2 Do better job resources mean higher job satisfaction and better work ability?

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### 3.2.1 Introduction

In the past, organizations were believed to work like machines, with a hierarchical flow of information from top to bottom. However, emphasis began to be increasingly placed on the interaction of the organization with its environment, and its maintenance of internal and external balance, and organizations came to be compared to living organisms. Recently, organizational culture, values, and beliefs have been regarded as more important, and organizations are now defined as cultures (e.g. Morgan, 1986). According to the cognitive approach, organizational culture is similar to the concept of organizational climate. In the context of positive job resources two concepts are of interest, innovativeness and empowering leadership (Bass 1999, Yukl 1999).

Learning organizations have structures that encourage individuals and groups to learn. This is very close to what is known as innovative organizational climate or innovativeness. Innovativeness is an interesting aspect of organizational culture (Moran, E.T & Volkwein 1992). West and Farr (1990) defined innovation as “the intentional introduction and application within a role, group or organization of ideas, processes, products or procedures, new to the relevant unit of adoption, designed to significantly benefit the individual, the group, the organization, or wider society”.

Few studies have, however, investigated how innovative organizational culture is associated with health and well-being. In a study of middle managers, job satisfaction was related to organizational climate factors such as human resource primacy (Kline & Boyd, 1991).

Innovative climate was better in managerial and expert work, and considered better by women than by men. Good innovative climate correlated positively with job satisfaction among men with higher educational levels, as well among both men and women with a lower educational level. Good innovative climate also correlated with a low level of distress symptoms among women with a lower educational level.

In a study of four Nordic countries, the innovative climate correlated positively with role clarity ( $r = 0.23$ ), positive challenges at work ( $r =$

0.39), own control of decisions ( $r = 0.37$ ), predictability of work over the coming month ( $r = 0.31$ ), supervisor support ( $r = 0.42$ ), co-worker support ( $r = 0.40$ ), empowering leadership ( $r = 0.48$ ) and social climate ( $r = 0.51$ ). Good innovative climate was also positively related to higher job satisfaction (Dallner et al., 2000).

The theory of psychological empowerment has been tested in the content of change-orientated leadership. Psychological empowerment refers to intrinsic motivation manifested in four cognitions, reflecting an individual's orientation to his or her work role: meaning, competence, self-determination, and impact (Thomas & Velthouse, 1990). Supervisors who reported higher levels of empowerment were regarded by their subordinates as more innovative, upward influencing, and inspirational (Spreitzer, De Janasz, & Quinn, 1999). As the notion of empowerment is based on research into alienation, participative management, and job enrichment (Spreitzer et al., 1999), empowering leadership is connected to various work characteristics measured by the QPS<sub>Nordic</sub> questionnaire (Dallner et al., 2000).

### *3.2.2 The present study*

The aim of the present study was to analyse how positive job resources such as innovative work climate and empowering leadership related to organizational and individual outcomes. The two measures of outcomes under study were job satisfaction and work ability. Their relation to work-related experiences and attitudes were analysed.

Job satisfaction usually refers to the subjective perception of the whole work situation including work itself, social relations and supervisory behaviour. Work ability indicates employees' evaluation of how capable and competent they are to perform a task and attain the goals set (Tuomi, Ilmarinen, Jahkola, Katajarinne, & Tulkki, 1998).

### *3.2.3 Subjects*

The study subjects were teachers from three Nordic countries: Finland, Norway and Sweden, ( $N = 1001$ ). The focus was on all age groups, but those over 55 years were somewhat over-represented. Both in Finland and Norway there were more female than male respondents (76% and 65% respectively), but in Sweden the proportion was equal (Pahkin, Björklund, Myckletun, Furunes, Gard and Linström 2008)

### *3.2.4 Measures*

The questionnaire method used – QPS<sub>nordicADW</sub> – was the Age Diverse Workforce version of a previously developed general questionnaire method

measuring job resources, psychosocial factors at work, work-related attitudes and experiences, and organizational and individual outcomes.

For the statistical analysis of the data, correlative analyses (Pearson's) were used to study the relationships between different scales. Particularly the interest was in the relations of two job resource factors, namely empowering leadership and innovative climate, and how they were related in the first phase to work-related experiences and attitudes, and secondly how these attitudes were related to two main outcome measures, job satisfaction and work ability.

### *3.2.5 Results*

The two outcome variables indicating well-being, job satisfaction and work ability, intercorrelated positively ( $r = 0.45$ ,  $p < .001$ ).

Next we analysed how the two job resource variables "innovative climate" and "empowering leadership" were separately related to work-related attitudes as well as to organizational and individual outcomes. Innovative climate correlated highly ( $r = 0.54$ ,  $p < .001$ ) with high organizational commitment and moderately with work motivation, but not at all with self-efficacy. Empowering leadership also correlated highly with organizational commitment ( $r = 0.48$ ,  $p < .001$ ), but had a rather low correlation with work motivation ( $r = 0.18$ ,  $p < .001$ ) and an almost insignificant relation to self-efficacy. The organizational commitment measures related highly to job satisfaction ( $r = 0.56$ ,  $p < .001$ ), but only moderately to work ability ( $r = 0.27$ ,  $p < .001$ ). Instead, work ability related highly to self efficacy ( $r = 0.50$ ,  $p < .001$ ). This means that the two job resource factors of innovative climate and empowered leadership have somewhat different contributions to job satisfaction and work ability.

### *3.2.6 Discussion and conclusions*

The two job resource factors, job satisfaction and work ability, were slightly dependent on each other but they contributed in different ways to the two central work-related outcomes the job satisfaction and work ability. In particular, self-efficacy was clearly behind work ability, but did not relate to job satisfaction, which seemed to be more dependent on organizational issues than inner motivation. It is concluded that the central issues of job satisfaction and work ability have different kinds of mechanisms behind them. This is an important implication when promoting the well-being and competence of employees.

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### 3.3 Resources and job performance: The mediating role of flow.

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#### 3.3.1 Introduction

The aim of this study was to investigate the impact of job and individual resources on job performance as mediated through flow. The present model thus tests parts of the working model (Figure 11). The highlighted text (bold font) in Figure 11 shows the aspects of the empirical model that will be investigated in this section.

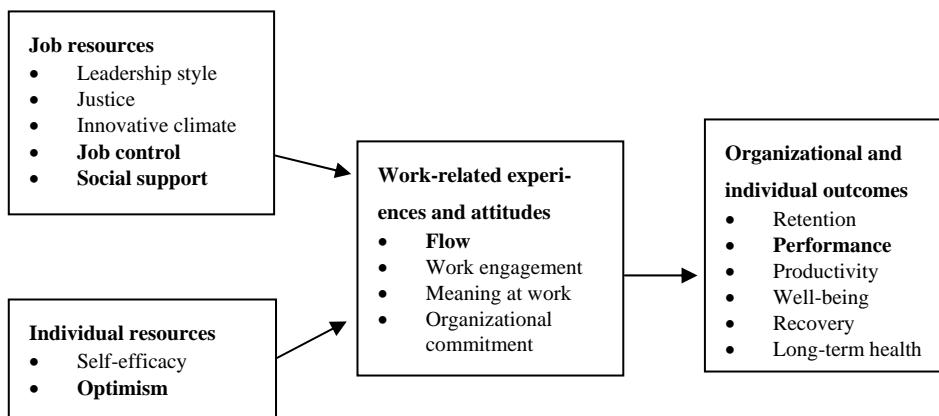


Figure 11. The working model

### 3.3.2 The present study

The present sub-study is partly based on the JD-R model and investigates how individual and organizational resources and flow influence job performance (Figure 11). Following the suggestions made by Bakker (2008), resources were defined as predictors of flow and job performance as an outcome, leaving flow as the mediating variable. Resources such as autonomy, control, social support, and also positive experiences such as flow, are all important features when attempting to create flourishing work environments. Redesigning work through facilitating positive factors may foster more productive workplaces. Schaufeli and Bakker (2004) emphasized that both organizational and individual resources (e.g. social support and perceived control) may lower job demands and thereby also reduce stress, burnout and possible negative health consequences. Resources can also contribute to intrinsic motivation, leading to growth, learning and development for employees (Schaufeli & Bakker, 2004).

The definition of job control (also called decision latitude) includes two components, decision authority and social support. Decision authority is a worker's ability to make decisions while working, and skill discretion refers to the variety of skills used by an employee when working. Social support, according to Karasek and Theorell (1990), is defined as overall levels of helpful social interaction available on the job from both co-workers and supervisors. Carver and Scheier (2002) argued that dispositional optimism is conceptually linked with expectancies of the future. Their expectancy-value model of motivation assumes that behaviour is aimed at the pursuit of goals which are viewed upon as either desirable or undesirable. People try to adjust their behaviour to what they view as desirable outcomes in relation to their motivation (Carver & Scheier, 2002). In the present study, job performance was defined and measured as overall self-perceived job performance (Kuvaas, 2006).

Flow is usually described as a state of mind where action and awareness merge (Csikszentmihalyi & Csikszentmihalyi, 1988). Most research to

date has approached this phenomenon through a state-oriented perspective, indicating that the experience is dependent on a person-situation fit rather than dispositional characteristics (Csikszentmihalyi, 1975; Jackson & Marsh, 1996; Kowal & Fortier, 1999). Most commonly, a match between challenges and skills is thought to be a premise, and the challenge-skill ratio (CSR) has been the dominating empirical approach. However, several attempts have been made to empirically operationalize flow in ways that do not depend entirely on the challenge-skill ratio of specific situations (for instance, see Jackson and Marsh, 1996, Flow State Scale). The work-related flow scale (WOLF) developed by Bakker (2008) is one such measure. Although Bakker theoretically draws on the work of Csikszentmihalyi, he defines flow as consisting of the three dimensions intrinsic motivation, intrinsic motivation, and absorption. Consequently, the items of the scale are oriented more towards a general tendency of being absorbed in work tasks, and post-evaluations of the cognitive and motivational characteristics of flow (Bakker, 2008). Based on the validation section of the previous report (published online in 2008), we applied this scale in testing our present model.

In previous research, flow has been treated both as a predicting variable and as an outcome. For instance, Straume (2008) found that flow predicted motivation, satisfaction and performance among employees. Intrinsically rewarding activities in general are thought to be favourable for higher levels of performance. Schmidt, Shernoff and Csikszentmihalyi (2007) investigated flow as an outcome variable and found that the challenge-skill ratio was among the weakest predictors. Although probably due to measurement errors rather than the nature of flow, these results nevertheless favour the testing of an alternative empirical model of flow such as the WOLF scale. In the Job-Demand Resources model (JD-R) proposed by Demerouti, Bakker, Nachreiner and Schaufeli (2001), both individual and job resources facilitate engagement and productivity. Following their line of thought, we believe that flow may function as a mediating variable between resources and performance.

Based on the working model of the Nordic Project (Figure 11), and the theory behind the JD-R model, it was hypothesized that social support and job control as organizational resources and optimism as an individual resource are positively related to flow and performance, and that flow functions as a mediating variable to performance.

### *3.3.3 Participants*

A Web-based questionnaire survey was conducted among employees in a banking group in Mid-Norway in 2007 (N = 360). The response rate was 51%, of which 52% of the respondents were women and 48% were men. Of the sample, 65% had a higher level of education, categorized as either a college or university degree. The mean age of the respondents was 50 years.

### 3.3.4 Measures

Two job resources were measured: job control relating to participation in decision making and use of one’s abilities (four items;  $\alpha = .71$ ), and social support relating to experiences of social support and help from leaders and colleagues (three items;  $\alpha = .74$ ). The responses were measured on five-point category scales ranging from 1 (very seldom) to 5 (very often). Both scales were taken from the “Job Content Questionnaire” (JCQ) (Karasek, 1985) and from a short version of “The Quality of Employment Survey” (Theorell, Michelsen, Nordemar, & Stockholm Music 1 Study Group, 1991).

Optimism and pessimism were measured by 10 items from the life orientation test – revised (LOT-R) (Scheier, Carver & Bridges, 1994). Four of the items were filler questions and were left out. Optimism was measured by three items ( $\alpha = .60$ ) and pessimism by three items ( $\alpha = .74$ ). The respondents indicated the extent of their agreement to each item using 5-point Likert scales ranging from (1) “strongly disagree” to (5) “strongly agree”. The pessimism scale was revised in the testing of the model.

Flow was measured by three indices: absorption (four items;  $\alpha = .81$ ), enjoyment (four items;  $\alpha = .94$ ) and intrinsic motivation (six items;  $\alpha = .79$ ) (Bakker, 2008). The scale ranged from 1 (never) to 7 (all the time).

Finally, job performance was measured with one scale (Kuvaas, 2006; 2007) (three questions;  $\alpha = .76$ ). The scale ranges from 1 (strongly disagree) to 5 (strongly agree).

### 3.3.5 Results

Zero-order correlations, means and standard deviations between the study variables are presented in Table 23. Optimism as an individual resource correlated with organizational resources at ( $r = .29$ ;  $p < .01$ ) for support, and ( $r = .40$ ;  $p < .01$ ) for decision making. Optimism was also positively correlated with flow ( $r = .40$ ;  $p < .01$ ), and job performance ( $r = .22$ ;  $p < .01$ ). Support was positively correlated with both decision making ( $r = .43$ ;  $p < .01$ ), flow ( $r = .36$ ;  $p < .01$ ), and job performance ( $r = .17$ ;  $p < .05$ ). Decision making correlated with flow at  $.53$  ( $r = .53$ ;  $p < .01$ ), and with job performance at  $.25$  ( $r = .25$ ;  $p < .01$ ). Finally, flow was moderately related to job performance ( $r = .34$ ;  $p < .01$ ).

**Table 23. Zero-order correlations of measured indicators**

	1.	2.	3.	4.
1. Optimism				
2. Support	.29**			
3. Decision	.40**	.43**		
4. Flow	.40*	.36**	.53**	
5. Job performance	.22*	.17**	.25**	.34**

Notes: N = 360; \* =  $p < .05$ ; \*\* =  $p < .01$

### 3.3.6 Measurement model

Our measurement model included support and decision making as organizational resources, optimism as an individual resource, and work-related flow and job performance. In line with the theoretical model suggested in our project, support and decision making were defined through a second order latent variable named organizational resources. The data fitted this model acceptably ( $\chi^2 [142, N = 360] = 333.22, p = .00, CFI = .91, GFI = .91, RMSEA = .06$ ).

### 3.3.7 The structural model

A full structural equation model was estimated with organizational resources and optimism as latent variables, both predicting flow and job performance. Organizational resources significantly explained variation in flow, ( $\beta = .68, p < .001$ ), and variance in job performance ( $\beta = .16, ns$ ). Optimism predicted flow ( $\beta = .16, p < .05$ ), but the zero-order correlation between optimism and job performance disappeared in the Structural Equation Model analysis ( $\beta = .01, ns$ ). Flow was a moderately strong predictor of job performance ( $\beta = .26, p < .001$ ), indicating that flow mediates the relation between organizational resources and optimism to job performance. The data had an acceptable fit with the full structural model:  $\chi^2 [142, N = 360] = 333.22, p < .05, CFI = .91, GFI = .91, RMSEA = .06$ . Factor loadings, residuals, beta weights, and correlations among latent variables for this model are presented in Figure 12.

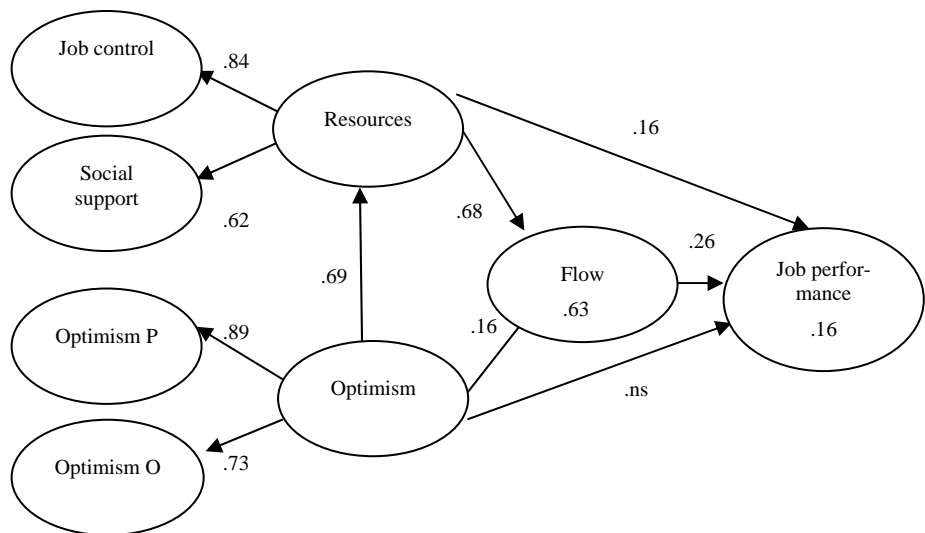


Figure 12. The best fitting partially mediated model ( $\chi^2 [142, N = 360] = 333.22, CFI = .91, GFI = .91, RMSEA = .06$ )

### 3.3.8 Summary and conclusions

The present sub-study supported our hypothesis and the working model of the Nordic project. The main finding of this study was that job resources (social support and job control) and individual resources (optimism) positively predicted flow, which in turn positively influenced job performance. The direct effect of optimism to job performance is not significant, and the direct effect of job resources to job performance is rather weak. The effect of flow on job performance is fairly strong. These results indicate that flow functions as a mediating variable between resources and job performance.

The study has certain limitations. Looking deeper into the results from the structural equation model, it is interesting to note that there is a strong association between job resources and optimism. Considering the strong relation between job resources and flow as opposed to the weak relation between optimism and flow, it is thus possible that optimism has a confounding effect on job resources.

Another possible limitation of the study is the measure of flow. Bakker (2008) built the WOLF scale on the flow theory as defined by Csikszentmihalyi and Csikszentmihalyi, (1988), indicating that a match between challenges and skills is present. However, the items do not include the challenge-skill ratio, are more framed towards a general tendency of being absorbed, and asks for post-evaluative responses on intrinsic enjoyment and motivation. It is questionable whether the scale actually measures flow, or whether it measures enjoyment and motivation. Future studies should take this issue into consideration.

Nevertheless, the present study adds valuable knowledge to the role of resources and flow on work performance. As a conclusion, the results support our hypotheses and indicate that positive resources, both at the individual level and the organizational level, may have an important role in the experience of flow at work and self-reported job performance. Consequently, it is important to strive for maintaining and building up resources in order to promote flow and job performance.

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### 3.4 Are work-related experiences of positive affect associated with employee well-being and the quality of the psychosocial work environment?

*Thomas Clausen*, National Research Centre for the Working Environment (NRCWE)

#### 3.4.1 Introduction

The aim of this section is to assess whether organizational commitment and experiences of meaning at work are associated with employee well-being on the one hand, and whether such work-related experiences of positive affect are associated with psychosocial work environment factors on the other. In assessing these associations we are also testing a part of the empirical model that was presented in the introduction. The highlighted text (bold font) in Figure 13 shows the aspects of the empirical model that will be investigated in this section.

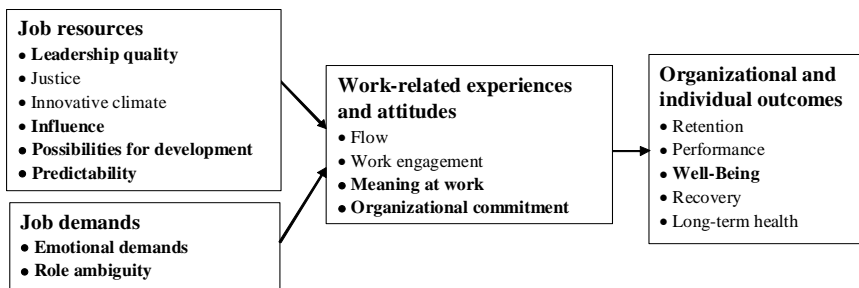


Figure 13. How section 3.4 contributes towards testing the empirical working model

The key concepts in this section are organizational commitment and experience of meaning at work, as these concepts are indicative of work-related experiences of positive affect of individual employees in regard to their work-organization and their work-tasks respectively.

Organizational commitment is a concept that has been the subject of analysis in numerous studies. In the most widespread conceptualization Meyer & Allen (1997) distinguish between three types of commitment that in different ways tie an individual and work organization – affective, normative and continuance commitment. In this context the concept of affective organizational commitment appears most relevant and according to Meyer & Allen (1997: 11), “affective commitment refers to the employee’s emotional attachment to, identification with, and involvement in the organization. Employees with a strong affective commitment continue employment with the organization because they want to do so’. In the literature, organizational commitment has been associated with a series of positive labour market outcomes, such as increased well-being, organizational citizenship behaviour, increased job performance, retention, and lower absenteeism (cf. Meyer & Allen, 1997: 25ff).

The concept of meaning at work has a somewhat more existential quality, as it describes the subjective kind of sense that employees make of their work tasks (cf. Wrzeniewski, 2003). According to Pratt & Ashforth (2003) individuals experience meaning at work when the work roles and work context are considered purposeful and significant, thereby affirming central aspects of individual identity. Furthermore, Pratt & Ashforth (2003: 313) describes meaningfulness as an “on-going, day-by-day, constantly unfolding phenomenon, not an end-state that is once-and-for-all-resolved’. Finally, Wrzeniewski (2003) states that meaningful work lives fulfil individual needs for purpose, values, efficacy, and self-worth, and hence the experience of meaning at work also contributes to individual well-being (see also Arnold, Turner, Barling, Kelleoway, & McKee, 2007).

Thus, following Schaufeli and Bakker’s Job Demands-Resources model (2004) it can be expected that a positive psychosocial work environment – i.e. a balance between job demands and job resources – will be associated with experiences of positive work-related affect (feelings of affective

organizational commitment and experiences of meaning at work). Furthermore, following their model, it is to be expected that experiences of positive affect in the workplace will be associated with the well-being of individual employees.

The Job Demands-Resources model thus describes a potential gain spiral where a positive psychosocial work environment induces experiences of positive affect (in the form of organizational commitment and experiences of meaning at work) that in turn translate into increased employee well-being. This gain spiral has similarities with Fredrickson's Broaden-and-Build Theory (2001; 2003) that posits that concurrent experiences of positive affect will have positive long-term impacts on individual well-being, resilience, adaptability, etc. that in turn will enhance individual capacity to engage in situations that produce positive affect.

Due to the cross-sectional nature of our data, however, we are unable to test any hypotheses regarding gain-spiral relationships between psychosocial work environment-factors, work-related experiences of positive affect (organizational commitment and experiences of meaning at work) and employee well-being. We are, however, able to test whether it is possible to detect cross-sectional associations between variables describing the psychosocial work environment, work-related experiences of positive affects and employee well-being. The existence of such association will thus support hypotheses regarding gain-spiral relationships between psychosocial work environment-factors, work-related experiences of positive affect and employee well-being.

#### *3.4.2 Methods*

This study was based on survey data from a cross-sectional of 9949 employees in the Danish elderly care services that was conducted in 2004–2005 (cf. Borg, 2008). The study assessed the associations between the scales shown in Table 24.

**Table 24. Overview of scales, sample questions and Cronbach's alpha values for the individual scales (cf. Borg, 2008; Kristensen, Hannerz, Hoegh, & Borg, 2005)<sup>2</sup>**

Scale name	No. of items	Sample question	Cronbach's Alpha
Well-being	5	How much time during the past 2 weeks have you been happy and in good spirits?	0.87
Organizational commitment	4	Do you enjoy telling others about your place of work?	0.75
Meaning at work	3	Do you feel that the work you do is important?	0.70
Emotional demands	3	Is your work emotionally demanding?	0.81
Role ambiguity	3	Do you know exactly how much say you have at work?	0.75
Influence at work	3	Do you have a large degree of influence concerning your work?	0.75
Possibilities for development	3	Do you have the possibility of learning new things through your work?	0.58
Leadership quality	5	To what extent would you say that your immediate superior is good at work planning?	0.89
Predictability	2	At your place of work, are you informed well in advance about, for example, important decisions, and changes of plans for the future?	0.76

All scales were measured with items on a five- or six-point Likert scale and were recoded into scales ranging from 0 to 100.

Each of the analyses was conducted as a two-step linear regression analysis and was adjusted for gender, age, cohabitation, children living at home, smoking status, BMI, job function (care work or non-care work), and tenure. The first step assessed the associations between indicators of the psychosocial work environment on the one hand and organizational commitment and meaning at work on the other. The second step assessed the associations between indicators of the psychosocial work environment, organizational commitment, and meaning at work on the one hand and well-being on the other. Combined, these two steps in the analysis formed a path-diagram that showed the associations between the indicators of the psychosocial work environment, the indicators of psychological attachments to the workplace, and employee well-being.

### 3.4.3 Results

The results of the analyses showed that experiences of positive affect in the workplace were associated with employee well-being on the one hand and indicators of psychosocial work environment on the other when adjusting for socio-economic factors, lifestyle and work characteristics.

<sup>2</sup> The scale "Role ambiguity" has been recoded from the original scale called "Role clarity". The scale measuring "Organizational commitment" was originally called "Involvement in the organization", but was renamed "Organizational commitment" due to its conceptual proximity to the concept of affective organizational commitment.

Figure 14 shows the statistically significant associations between the scales entered into the two steps in the analyses. It is evident from Figure 14 that organizational commitment and experience of meaning at work are strongly and positively associated with employee well-being. The figure also shows that employee well-being is directly and positively associated with leadership quality and influence, whereas we found direct negative associations between emotional demands and role ambiguity on the one hand and employee well-being on the other. Of the indicators of psychosocial work environment, we found a strong association between emotional demands and well-being, and also relatively weaker associations between role ambiguity, leadership quality, and influence on the one hand and well-being on the other.

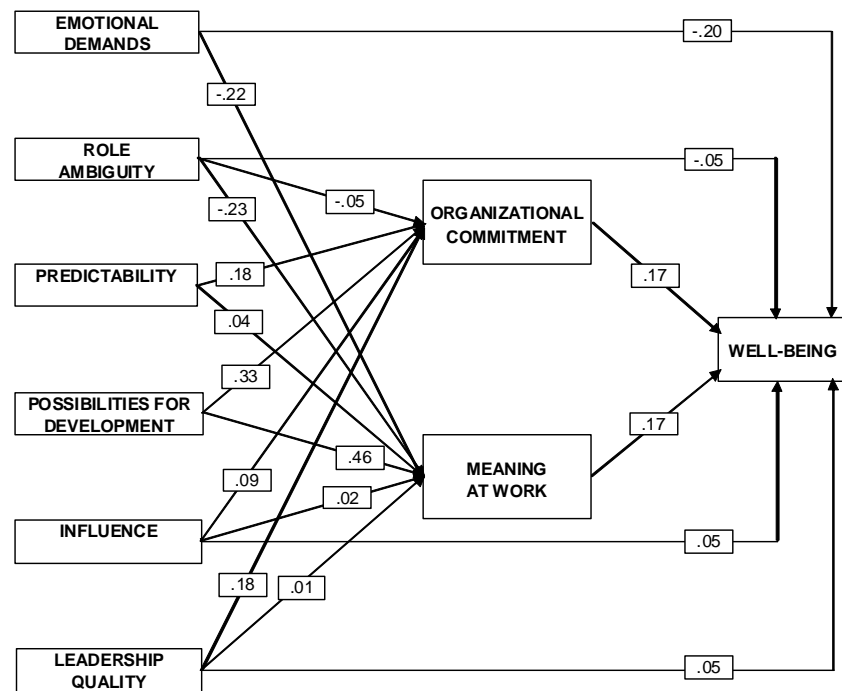


Figure 14. Path-diagram of statistically significant associations from stepwise multivariate regression analyses of the associations between indicators of psychosocial work environment, experiences of positive affect in the workplace, and employee well-being (Beta-coefficients);  $p < 0.0001$  where estimates are shown in bold font

Figure 14 also shows that experiences of predictability and possibilities for development are indirectly associated with employee well-being insofar as they are positively associated with our two indicators of work-related positive affect, that in turn are positively associated with employee well-being. A regression analysis that investigated the associations between the six indicators of psychosocial work environment and employee well-being revealed a direct association between predictability and possibilities for development and employee well-being (results not

shown), which thus indicated that these associations may be mediated by organizational commitment and experiences of meaning at work.

Furthermore, Figure 14 shows that experiences of positive affect in the workplace are associated with the six indicators of the psychological work environment. The path diagram thus shows that organizational commitment is negatively associated with emotional demands and role ambiguity, whereas a positive association is identified between predictability, possibilities for development, influence, and leadership quality. In addition, Figure 14 shows that experiences of meaning at work are positively associated with predictability, possibilities for development, influence, and leadership quality, and negatively associated with emotional demands and role ambiguity.

Finally, the model explains roughly 26% of the variance in employee well-being ( $R\text{-square} = 0.2568$ ). Furthermore, the six indicators of psychosocial work environment explained almost 47% of the variance in the meaning at work-scale ( $R\text{-square} = 0.4659$ ) and 43% of the variance in the scale measuring organizational commitment ( $R\text{-square} = 0.4284$ ).

#### *3.4.4 Discussion*

The results support the hypotheses put forward in our working model, as we found that affective organizational commitment and experiences of meaning at work were simultaneously associated with employee well-being and psychosocial work environment factors. Furthermore, the results show that experiences of positive affect in the workplace are associated with employee well-being independently of psychosocial work environment factors, as the analysis also can be construed as an analysis of the association between experiences of positive affect and employee well-being, when adjusting for psychosocial work environment factors. According to Lyubomirsky, King, and Diener (2005), frequent experiences of positive affect have been associated with a series of positive work-related outcomes, such as job performance, retention potential, and positive supervisory evaluations, and accordingly it appears to make sense for employers to facilitate a work environment that enhances the possibilities of employees to experience positive affect, which in turn may have a bearing on a number of positive organizational and individual outcomes.

Thus, in a wider perspective the results of the analyses contribute to the affirmation of the relevance of positive psychological reasoning as they point to the positive dynamics inherent in the associations between the quality of the psychosocial work environment, employee experiences of positive affect and employee well-being.

Further, the analyses lend support to the Job Demands-Resources model (Schaufeli & Bakker, 2004) as the results showed an association between indicators of the psychosocial work environment, experiences of positive work-related affect, and employee well-being. In addition, the

results pointed in the expected directions, as we found positive associations between organizational commitment and experience of meaning at work on the one hand, and employee well-being on the other. The results also showed that the two forms of positive work-related affect that we investigated were negatively associated with the job demand scales (emotional demands and role ambiguity) and positively associated with the job resource scales (predictability, possibilities for development, influence, and leadership quality), which is also in accordance with the predictions of the Job Demands-Resources model. Finally, the analyses showed that job demands were negatively associated with employee well-being whereas we found positive associations between indicators of job resources and employee well-being.

The analyses furthermore lend credence to Fredrickson's Broaden-and-Build Theory that points towards potential gain spirals associated with experiences of positive affect. Even though longitudinal data are needed in order to study such gain spirals, the identified associations are a necessary prerequisite for such gain spirals to occur. However, more research on this topic is needed in order to establish more thorough knowledge on such potential gain spirals.

The analyses also identify avenues for action in order to improve employee well-being. One course of action may imply job redesign in order to make the work tasks more meaningful, and also organizational action in order to improve affective organizational commitment amongst employees. Another course of action entails improvements in the psychosocial work environment in order to increase job resources and/or reduce the experienced job demands.

Finally, the results of these analyses must be interpreted with caution, as they were generated from cross-sectional data, which means that we do not have a temporal separation between our variables, which also precludes our possibilities for identifying causal associations between our variables. Furthermore, it must be kept in mind that the data are self-reported and that bias due to common methods also may occur.

#### *3.4.5 Conclusions*

The results of the analyses thus show that the psychosocial work environment is associated with organizational commitment and experience of meaning at work of employees in the Danish elderly care services. Furthermore, the results show that organizational commitment and experiences of meaning at work are associated with employee well-being even when adjusting for six indicators of psychosocial work environment. In addition, the results have relevance for workplace strategies aimed at improving employee well-being. Finally, the results support the conceptual framework put forward in the empirical working model presented in Figure 14.

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### 3.5 Job demands and job resources as predictors for turnover mediated by health and meaning at work and organizational commitment.

*Vilhelm Borg*, National Research Centre for the Working Environment (NRCWE)

#### 3.5.1 Research questions

In this section we want to test a part of our working model (see section 1.1 where the model is described in more detail). The question is how job resources and job demands predict turnover, and to what degree these associations are mediated by health and well-being and by perception of

meaningfulness in the work and organizational commitment. Further, we want to test whether these associations are mediated by intention to stay or leave the present workplace.

Our hypotheses are shown in Figure 15. Hypothesis 1 is that a) high job demands and high work-family conflicts are associated with high actual turnover, and b) these associations are mediated primarily by low health and well-being. Hypothesis 2 is that a) high job resources are associated with lower actual turnover, and b) these associations are mediated primarily by perception of meaning in work and organizational commitment. Hypothesis 3 is that all these associations are mediated by intention to stay or leave the workplace.

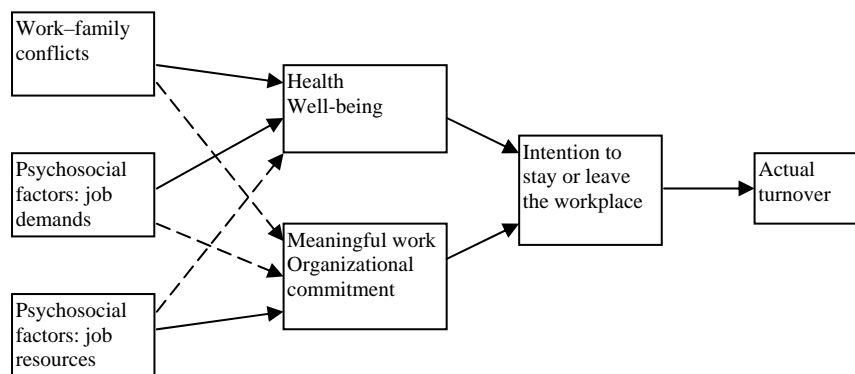


Figure 15. Hypotheses on the associations between job resources and job demands and actual turnover from the workplace after 1½ years

### 3.5.2 Method

The study sample consisted of employees who answered the questionnaire at baseline and from whom we received information from their employers about their status 1½ years later. The sample size was 9949, and 15.1% had left their workplace at follow up.

*Job resources* were assessed by five scales: influence at work, possibilities for development, quality of leadership, predictability, and role clarity. *Job demands* were assessed by four scales: quantitative demands, emotional demands, demands for hiding emotions, and role conflicts. *Work–Family Conflict* was measured by a scale based on four items.

We tested the hypotheses by stepwise logistic regression. In step one we included all job demands, job resources and work family conflicts, together with gender, age and tenure as covariates. In step two we tested three mediation models, one with health and well-being as mediators, another with meaningfulness and organizational commitment, and a third one with all four potential mediators. In step three we tested the hypothesis that intention to stay or leave mediates the significant associations from steps one and two. All of the predictors were standardized (z-value), and the regression models estimated odds ratios of 1 standard deviation

on all of the scales. The degree of mediation was estimated by computing the reductions in OR's from model 1 to the others models

Finally, we estimated the risk for actual turnover in each of ten risk groups on the basis of the significant risk factors in step one by using Hosmer & Lemershaw's goodness-of-fit method.

### 3.5.3 Results

The results of model 1 show that three of the job resources are associated with lower turnover rates and one of the job demands: role conflicts and work-family conflict are associated with higher turnover rates (Table 25, model 1). Hypotheses 1a) and 2a) were confirmed.

The results from step 2 (Table 25, models 2.1–2.3) show that health and well-being partly mediated the association between work-family conflict and turnover, and that meaningfulness and organizational commitment mediated fully the association between possibility for development and turnover and partly mediated all other associations. Hypothesis 1b) was not confirmed because health and well-being mediated the associations between job demands and turnover to a lesser degree than meaning at work and organizational commitment. Hypothesis 2a) was partially confirmed because the association between job resources and turnover was mediated by meaning at work and organizational commitment. Hypothesis 3 was confirmed, as almost all of the associations were mediated by intention to stay or leave. The only exception was that influence at work still had an independent effect on turnover.

**Table 25. Regression results. Turnover at follow-up predicted by work environment, meaning at work, organizational commitment, and intention to stay at baseline. OR's of one standard deviation of the predictors are shown. For models 2.1–2.3 and model 3 the reductions in OR are shown.**

	Model 1		Model 2.1		Model 2.2			Model 2.3			Model 3			
	OR	Sig.	OR	Sig.	reduct	OR	Sig.	reduct	OR	Sig.	reduct	OR	Sig.	reduct
Zinf	0.91	0.00	0.93	0.04	-0.25	0.92	0.01	-0.12	0.94	0.07	-0.33	0.91	0.01	-0.05
Zposdev	0.91	0.00	1.01	0.80	-1.11	0.93	0.02	-0.22	1.02	0.68	-1.18	1.01	0.79	-1.12
Zwfc	1.12	0.00	1.09	0.01	-0.19	1.07	0.04	-0.38	1.06	0.07	-0.45	1.02	0.58	-0.83
Zrolecon	1.08	0.03	1.05	0.17	-0.38	1.06	0.07	-0.16	1.04	0.23	-0.46	1.04	0.23	-0.44
Zquallead	0.90	0.00	0.95	0.17	-0.51	0.91	0.01	-0.11	0.96	0.21	-0.55	0.98	0.59	-0.80
Zhealth						0.92	0.01		0.92	0.01		0.95	0.12	-0.38
Zwb						0.93	0.03		0.96	0.20		1.00	0.98	-0.98
Zmean			0.92	0.03					0.93	0.07		0.95	0.25	-0.33
Zorgcom			0.85	0.00					0.85	0.00		1.10	0.03	-1.66
Zintent												0.46	0.00	

Notes: Zinf = influence (standardized), Zposdev = possibilities for development (standardized), Zwfc = Work-Family Conflict (standardized), Zrolecon = role conflicts (standardized), Zquallead = quality of leadership (standardized), Zhealth = self-rated health (standardized), Zwb = well-being (standardized), Zmean = meaningfulness of work (standardized), Zorgcom = organizational commitment (standardized), Zintent = intention to stay (standardized)

Figure 16 shows the results of the risk estimation. Employees in the highest 10% risk group based on the significant work environment factor have

a turnover rate of 37% compared with a turnover rate of 5% in the lowest risk group.

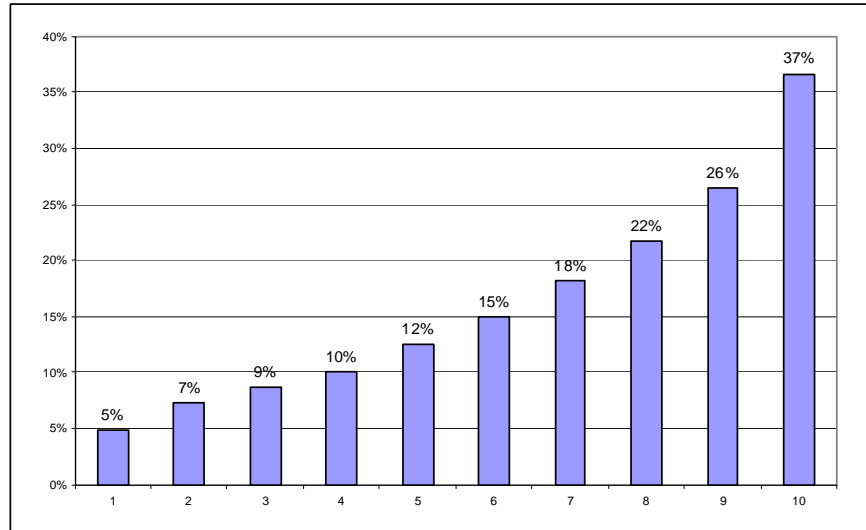


Figure 16. Turnover rate at follow-up in 10 risk groups based on risk estimation on the basis of significant work environment factors at baseline

#### 3.5.4. Conclusions

The study supports our working model showing that both job demands and job resources influence actual turnover from the workplace. Further, the analyses show that the association between the work environment factors and turnover are mediated by health and well-being and by meaning at work and organizational commitment.



## 4. Conclusions

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### 4.1 On the development of a positive work-life psychology

Within working life research as well as within work psychology there has been a long and strong tradition of focusing on risks, problems, diseases, and other negative aspects of the work environment. Modern reflexive social systems and organizations incorporate, internalize, and apply this knowledge, which creates new conditions for research and reflexivity, and so forth. There are similar processes on the individual level – people reflect and internalize knowledge which changes their perceptions, cognitions and action strategies. In that way our societies have gained much knowledge about what work conditions should be avoided or eliminated. This “elimination approach” has been rather successful, especially as a perspective for improving the physical work environment. Within the psychosocial field, the application of research into practice has resulted in what can be named psychological anti-demands: work should not be mechanically paced, monotonous, or over-stimulating or under-stimulating; work patterns should not be standardized; and so forth. This knowledge is very relevant in an era when work of that type dominates but is insufficient or inadequate for a working life where key issues for progress are motivation, cooperation and creativity. Research results from this elimination approach are quite instrumental and have been used in legislation and for decisions on work environment threshold values. However, the elimination or avoidance of exposition of negative states or factors does not always result in a positive situation because positive states are often something qualitatively different – not just the reverse. For instance, the absence of work dissatisfaction is not the same as work satisfaction, and absence of monotony does not necessarily mean meaningfulness or positive work-related work experiences.

In the Nordic welfare states, as in many other countries, there exists thinking and politics which hold that work should offer something more than an activity one does for money. According to this view, work should contribute to individual satisfaction, personal development, occupational skills, health, etc. In addition, employees are also expected to be

(pro)active agents, highly competent, and capable of learning and taking responsibility for top quality performance in their daily work. In this perspective, the hitherto dominating “eliminating approach” or “disease model” is evidently not sufficient. On the road to a more individualized and health and development oriented working life there is need for a research perspective that generates knowledge on how to form “healthy work” and “healthy workplaces”. The positive psychology movement is an inspirational source for occupational psychology to move in that direction. Most research within positive psychology has been carried out in the field of clinical psychology and there are relatively few studies or developed perspectives within occupational psychology. However, this does not mean that there is an almost total lack of a positive occupational psychology. Many traditional studies and projects within work life psychology use “positive concepts” and carry out research on positive outcomes. For instance, the main conclusion from the well-known demand – control model is not to reduce job demands when there is a balance but to increase an individual’s control and resources, which are positive concepts. This mixture is reflected in our working research model, which consists not only of core concepts in positive psychology, such as flow and optimism, but also of concepts from the more traditional occupational psychology and stress research.

## 4.2 Empirical studies of positive factors in a Nordic working life context

In the first report on our project (<http://www.norden.org/pub/sk/show-pub.asp?pubnr=2008:501>) the general framework for investigating positive factors at work was introduced. The primary aim of this second report and study has been to contribute to clear definitions of some positive psychology concepts by investigating their psychometric properties and some hypothesized associations between them in a Nordic working life context. More precisely, the aim of the study presented here has been twofold: (1) to validate some chosen positive work-related measures in Nordic datasets, and (2) to test our working model of positive factors at work, developed in the first report from different angles and using different types of datasets. As mentioned in the Introduction (section 1), positive psychology aims to promote positive outcomes on three levels: individual, organizational, and societal. In this phase, our working model has focused on the individual level but also covered some organizational aspects through concepts such as leadership quality, justice and innovative climate.

In the first part of this report the validated measures included *positive states and experiences at work*: flow, work engagement, meaning at work, and organizational commitment, *job resources*: values (trust, justice, and social responsibility), innovative climate, and empowering leadership, and

*personal resources*: optimism. Moreover, we validated several positive outcomes, such as positive mental health, long-term health, recovery, and intention to stay. The second part consisted of five studies testing our working model. All of the studies included different types of job resources which, on the basis of these studies and also supported by several previous studies, can act as “energizers” of employees and consequently as triggers of positive processes leading to employee well-being and positive individual and organizational outcomes. Three of the five studies presented here also included measures of job demands which, if high, are assumed to have a negative impact on employee well-being and organizational outcomes. Even after taking into account the negative impact of job demands, our results still showed the power of positive factors and processes that may lead to, for example, good performance at work, employee well-being, and staff retention. One of the studies showed that in addition to job resources also a personal resource, optimism, may have a salient role in employee well-being. All of these results are consistent with the findings of studies directly employing the Job Demands-Resources model (Demerouti, Bakker, Nachreiner, & Schaufeli, 2001).

Our studies also included several positive mediators, such as engagement, flow, meaning at work, and organizational commitment, which are desirable outcomes in themselves. Triggered by job and personal resources, these mediators may further enhance other positive outcomes, of which we focused on job performance and job satisfaction, positive mental health, work ability, and retention (instead of turnover). All in all, the results of these studies support our working model and the assumption of “resource caravans” and cumulative resource gains, i.e. resources, whether personal, social, material, or related to conditions, tend to aggregate and form so-called “resource caravans” (Hakanen, Perhoniemi, & Toppinen-Tanner, 2008; Hobfoll, 1998; 2001). Therefore, the major challenge in developing working conditions is to promote good qualities, namely resources and strengths in employees and in organizations.

### 4.3 Final words

The insights from the study concern many different questions and aspects, and as always in research some questions have been answered and new questions have been raised. We hope that our first attempt to identify positive occupational psychology concepts and to create a model for testing these concepts will inspire other researchers and students to use the items and scales. In that way, experience will be accumulated and new innovative ideas will emerge.

As exemplified above, we do not think that a positive occupational psychology perspective is in conflict with the traditional and established work psychology or disease model – the role is rather to contribute to a

new working life research front with a strong potential for generating knowledge for preventive measures. The Nordic welfare states, with their view that work should contribute to personal growth and health, should have a special interest in research and knowledge for such a development.

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# Sammenfatning

Denne rapport indeholder resultater fra projektet „Positive faktorer i arbejdet“, der er finansieret af Nordisk Ministerråd. Projektet baserer sig på et samarbejde mellem forskere fra følgende nordiske lande: Norge (Psykologisk institutt, Norges teknisk-naturvitenskapelige universitet (NTNU) og Institutt for ledelse og organisasjon, Handelshøyskolen, BI), Sverige (Institut for Psykologi, Stockholms Universitet), Danmark (Det Nationale Forskningscenter for Arbejdsmiljø (NFA)), og Finland (Det Finske Institut for Arbejdsmiljø (FIOH)). Formålet med projektet er at bidrage til udviklingen af teori og metode om positive faktorer i arbejdet i en nordisk arbejdsmiljøsammenhæng. Formålet med denne rapport er på den ene side at validere udvalgte måleinstrumenter af positive faktorer i arbejdslivet på baggrund af nordiske spørgeskemadata, og på den anden side at teste den begrebslige model om sammenhængen mellem positive faktorer i arbejdslivet, der blev udviklet i den første rapport fra dette projekt (<http://www.norden.org/en/publications/publications/2008-501>).

I den første del af denne rapport testes validiteten og reliabiliteten af de spørgeskemainstrumenter, der er blevet anvendt til at måle forskellige positive begreber. Valideringsstudierne indeholder en kort præsentation af begrebernes teoretiske baggrund og deres relevans i arbejdslivet, hvorefter forskellige aspekter af måleinstrumenternes validitet (factorial validity og construct validity) undersøges. De validerede måleinstrumenter måler positive tilstande i arbejdslivet, personlige og arbejdsrelaterede ressourcer, samt en række positive arbejdsrelaterede og organisatoriske udfald. I den anden del af rapporten fokuseres der på at analysere fem forskellige aspekter af den begrebslige model, der blev udviklet i den første rapport fra projektet. Disse fem analyser fokuserer på forskellige typer af arbejdsrelaterede ressourcer og tre af de fem analyser inkluderer ligeledes forskellige mål for arbejdsrelaterede krav, der, hvis de er for høje, kan have negativ indflydelse på medarbejdernes trivsel samt en række organisatoriske udfald. Resultaterne viser, at positive faktorer i arbejdslivet medfører en række positive resultater i forhold til arbejdspræstationer, trivsel i arbejdet, samt mulighederne for at fastholde medarbejdere. En af analyserne viser herudover, at personlige ressourcer – i dette tilfælde optimisme – har stor betydning for medarbejdernes trivsel. Analyserne viser endvidere, at positive tilstande i arbejdslivet, som fx involvering i arbejdspladsen, engagement, flow, og oplevelse af mening i arbejdet ligeledes har betydning for arbejdspræstationer, trivsel i arbejdet, samt mulighederne for at fastholde medarbejdere.

Sammenfattende kan det siges, at resultaterne af analyserne støtter vores begrebslige model, og at det er en stor udfordring for de nordiske

velfærdsstater at bidrage til at de positive faktorer, der er blevet identificeret i den positive arbejds- og organisationspsykologi i stigende grad bliver en integreret del af arbejdslivet i de nordiske lande.

# Tiivistelmä

Tämä raportti perustuu Pohjoismaiden Ministerineuvoston rahoittamaan ”Positiiviset tekijät työssä” -projektiin. Projekti on pohjoismainen yhteishanke, johon osallistuivat Norja (Norjan tiede- ja teknologiayliopiston psykologian osasto, Norjan liiketalouden kauppakorkeakoulu), Tanska (Työelämän kansallinen tutkimuskeskus), Ruotsi (Tukholman yliopiston psykologian osasto) ja Suomi (Työterveyslaitos). Hankkeen päätavoitteena on ollut kehittää työn myönteisiä tekijöitä koskevia menetelmiä ja teoriaa sovellettuna pohjoismaisiin työolosuhteisiin. Tavoite on ollut kaksitahoinen: 1) validoida tiettyjä keskeisiä työn positiivisia tekijöitä mittaavia menetelmiä pohjoismaisissa tutkimusaineistoissa ja 2) sen jälkeen testata eri aineistoissa hankkeen ensimmäisessä raportissa kehitettyä teoreettista mallia työn positiivisten tekijöiden keskinäisistä suhteista. Hankkeessa hyödynnetyt projektit, aineistot ja asteikot on esitelty pohjoismaisen projektin ensimmäisessä raportissa (<http://www.norden.org/en/publications/publications/2008-501>).

Tämän raportin ensimmäisessä osassa on testattu valittujen positiivisten muuttujien reliabiliteettia ja validiteettia. Tässä osassa esitellään tarkasteltujen asteikkojen teoreettinen tausta ja käsitteiden määritelmät, perustellaan valittujen käsitteiden merkitys työelämälle sekä esitetään tulokset myös menetelmien faktori- ja rakennevaliditeetista. Validoidut menetelmät koskevat myönteisiä tiloja ja kokemuksia työssä, työn voimavaroja, yksilöllisiä voimavaroja sekä näiden monia oletettuja myönteisiä seurauksia. Raportin toisessa osassa esitellään viisi tutkimusta, joissa hankkeessa kehitettyä teoreettista mallia on eri tavoin testattu. Kaikki nämä tutkimukset sisältävät erityyppisiä työn voimavaroja ja kolmessa tutkimuksessa tarkastellaan myös työn vaatimuksia, joilla oletetaan olevan kielteisiä vaikutuksia työntekijän hyvinvointiin ja organisaatioon.

Tulokset osoittivat positiivisten tekijöiden ja prosessien voiman ja sen, että ne voivat johtaa esimerkiksi hyvään työssä suoriutumiseen, työntekijöiden hyvinvointiin ja työntekijöiden jatkamiseen samassa työpaikassa ja työelämässä ylipäätään. Yksi tutkimuksista osoitti, että työn voimavarojen lisäksi yksilöllisellä voimavaralla, optimismilla, voi olla keskeinen merkitys työhyvinvoinnille. Tutkimukset osoittivat myös, että monilla positiivisilla työntekijöiden tiloilla ja kokemuksilla, kuten työn imulla, uppoutumisella („flow“), työn merkityksellä ja sitoutumisella on ns. välittävä rooli positiivisten työolojen ja yksilöllisten ja organisatoristen seurausten välillä: kun työssä on riittävästi energisoivia voimavaroja, lisäävät ne myönteisiä työhön liittyviä tunteita ja asenteita, joilla edelleen on myönteisiä seurauksia työpaikalle ja työntekijöille. Yhteenvetona tulokset tukivat oletettua tutkimusmalliamme. Keskeisenä haasteena pohjoismaisissa hyvinvointiyhteiskunnissa onkin edistää työntekijöiden ja -organisaatioiden voimavaroja ja vahvuuksia.