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## **Working Conditions and Wellbeing**

A multilevel analysis of 34 European countries

Master's thesis in Sociology

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## ***Preface***

This thesis concludes five years of sociology studies at NTNU in Trondheim. I came into sociology at the age of 40, but being a student at this stage in life has been like finding the fountain of youth.

I would like to thank my old co-workers at the nursing home, as well as the extremely knowledgeable people at the local union, for awakening my interest in the study of working conditions. Without this experience, it is very unlikely this thesis would have ever been written.

I would like to thank my fellow students and “coffee sociologists” for endless hours of discussion at the university canteen. I feel like I have learned at least as much from my talks with you as I have from the books and articles I have read.

I would like to thank all the gracious staff at the Department of Sociology and Political Science for their help through these years. The administrative staff has answered every question and helped me out with every problem I’ve had along the way. The professors, adjuncts and teaching assistants have answered all my questions every time I have sent an email or knocked on a door. I am very grateful for all the guidance, counselling and advice I have received. Special thanks go out to my advisor, Professor Terje Andreas Eikemo, who has supported and encouraged me in the endeavour of this thesis.

Last, but not least, I am forever indebted to my family for all their help and support. Without their patience and sacrifice, I would not have been able to pull this off.

I would like to share the credit for the current work with all the people I have mentioned above. I alone am responsible for all remaining flaws.

Trondheim, May 2014,

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## Summary

This paper studies the effects of working conditions on wellbeing in 34 European countries. The background for the study is an interest in work as a social determinant of health, in this case mental health as captured in the concept of wellbeing.

Working conditions are theorized at three levels. At the micro level, the psychosocial theories on stress and the work environment are reviewed; the demand-control-support model, effort-reward imbalance, organizational justice and emotional labour. The physical environment is also covered. At the meso level, social class is theorized as relational versus positional, and its relationship to the social gradient is discussed. At the macro level, two alternative typologies are compared. First, the typology of welfare state regimes based on Esping-Andersen (1990). Second, the typology of what I refer to as *working conditions regimes*, based on the Work Security Index (Roskam 2009).

The thesis uses data from the European Working Conditions Survey. The technique of multilevel analysis is applied using a random intercept model, showing that around 5.7% of the variation in wellbeing stems from the national level.

The results show that psychosocial theories such as the demand-control-support model, effort-reward imbalance, organizational justice, as well as the physical environment all have a significant influence on wellbeing, while emotional labour does not. Occupational class has a significant effect for lower classes. At the national level, there are more significant differences between the working conditions regimes than among the welfare states regimes. In terms of effects sizes, the psychosocial models are about as influential as the working conditions regimes, while class appears to have relatively modest influence on wellbeing.

Working conditions regimes thus emerge as a viable alternative to welfare regimes when studying health related inequalities in the field of working conditions.

The theoretical basis for the working conditions regimes is discussed, and there appears to be need for further theorizing and empirical research on this relatively new concept. Justice is proposed as a key framework influencing wellbeing at an institutional level, beyond the psychosocial. The thesis also argues that structural explanations to national differences in wellbeing are in need of further research.



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# 1. Introduction

*“Labour is, in the first place, a process in which both man and Nature participate, and in which man of his own accord starts, regulates, and controls the material reactions between himself and Nature... By thus acting on the external world and changing it, he at the same time changes his own nature.”* (Marx, [1867] 1967:177-178)

## 1.1. Background

The background for this thesis is an interest in work as a social determinant of health, in this case specifically, mental health as captured in the concept of *wellbeing*. Work is implicitly or explicitly deemed as a central factor in shaping health in general by a large number of writers from Marx onwards. As we can tell by the quote above, Marx saw the human condition in industrialized society as shaped by, and embodied in, the commodification of labour (Morrison 2006). Labour is also widely seen as the prime expression of class position in society. Marx held the distinction between labourer and capitalist as the foundation for capitalist society and class struggle. Even non-Marxists such as Weber saw work in a class perspective, determining life chances for the individual, as a source of status and privilege (Ritzer & Stepnisky 2014:127-128).

The argument has been made that the nature of work has changed, and that the Western economies have entered into a post-industrial society (Doogan 2009, Bambra 2011). The toxic fumes of the factories have allegedly been superseded by other health risk factors. In particular, the *psychosocial work environment*, which I will elaborate further on in chapter two, has received widespread attention. Karasek & Theorell’s work (1990) on job demands and job control has perhaps been particularly influential. The concept of *stress* has been extremely important within this field, and I will review this as well in chapter two. This “new world of labour” places new kinds of demands on worker’s minds, and affects their mental health. These ideas will be very important in the current writing.

The concept of health can be construed in many ways, and it is in many ways an all-encompassing concept, as defined by the WHO (1946): *“Health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity.”* This definition divides the concept of health into three different categories. Arguably, these categories overlap, but in terms of medicine, somatic and mental health are broadly separated into two different education and treatment systems. Diseases perceived as stemming from the body are usually treated by the physicians and surgeons, whereas diseases perceived as

stemming from the mind are usually treated by the psychiatrist and the psychologist. I will be focusing on the issue of mental health, but from a mainly sociological rather than psychological perspective.

Health as a social phenomenon has been gaining interest as a field of research in later years. In particular, social inequalities in health have received widespread attention, such as Wilkinson & Pickett's (2009) claim that social inequality is in itself bad for public health. Less attention seems to have been given to the specific field of social inequalities in mental health.

Mental health is often referred to as a research field in the psychological domain. However, sociology actually has a long tradition of investigating this field. The current study takes inspiration from Durkheim's ([1897] 2002) classic study of suicide. Durkheim was not interested in individual (psychological) causes of suicide; rather, he was interested in why suicide *rates* were different in different countries (Ritzer & Stepnisky 2014:92). Durkheim's answer was that the difference in suicide rates could not be found within the individual minds of different people, rather, it must be found in the *societies*, and *between* them. Similarly, I wish to study differences in wellbeing rates between countries, in addition to individual and class related differences.

## **1.2. Research question**

The current study thus undertakes to research how working conditions affect mental health as expressed in the concept of wellbeing. The data is gathered from 34 different countries in Europe. I expect to find differences at the individual level, mainly due to psychosocial factors. I expect to find class differences in work-related wellbeing. I also expect that there will be systematic variation between countries, due to structural differences in welfare, legislation and organization of the labour markets. The overall research question encapsulates all these levels, and is phrased as follows:

*What are the effects of working conditions on wellbeing in Europe?*

I plan to explore this question in the following way: First, I will give an overview of the dominant theories on the nature of work in the 21st century. The concept of "working conditions" will then be explored, and I will then proceed to an overview on the concept of wellbeing as it pertains to working life. I will review theory and research on micro, meso and macro level determinants of work-related wellbeing.

To explore individual and structural differences in wellbeing, I will apply the method of linear multilevel analysis on survey data from 34 European countries, using wellbeing as a continuous measure, before presenting results, a discussion and a conclusion.

## **2. Working conditions and wellbeing: theory and research**

I will begin this chapter with a brief discussion on the importance of perspective in social research, before doing a short review on the ideas of the changing nature of work in the 21<sup>st</sup> century. I will then delineate what is meant by the terms working conditions and wellbeing. A major part of the chapter will then deal with psychosocial theories and stress as well as the physical work environment, which are seen as the closest to the individual level. The last third of the chapter deals with structural approaches. At the meso level, I will discuss social class as a determinant of wellbeing. At the macro level, I will present welfare state regimes and the alternative typology of what I will call *working conditions regimes*, based on the Work Security Index of Ellen Rosskam (2009). For each of the theories, I will present an integrated account of the theory, evidence from empirical research, as well as expectations based on theory and evidence. I will conclude the chapter with presenting an overall model of working conditions and wellbeing, and sum up the expectations.

### **2.1. A sense of perspective**

Social theorist Niklas Luhmann argued on the importance of perspective in social research, and that all researchers have a blind spot: “*An observer cannot see what he cannot see*”, says Luhmann (1997). I therefore wish to present my point of perspective, so that others might observe my blind spot. I will link this discussion to Weber’s notion of *value-free sociology* (Ritzer & Stepnisky 2014:122).

While doing research for this thesis, I came across the book “Unhealthy Work”, edited by Schnall, Dobson and Rosskam (2009). This book has gathered theory and evidence on the connections between work and health. While reading the introductory chapter, I was reminded of the importance of perspective. The book gathers results from research worldwide, but it is written by Americans, and importantly: to a large degree *for* Americans: “*This book focuses on the detrimental health effects... particularly in the United States, albeit with the aim that this knowledge can be applied in the developing countries as well*” (Schnall et al 2009:6). The book stresses how the concept of *individualism* (ibid:10) affects the way working life is talked and thought about in the American context: Health is seen as an individual responsibility, with individual causes, rooted in lifestyles choices. The very idea of

pointing towards societal effects of health can be controversial in the USA. The entire book, then, must be read in this light: Its readers must be convinced to accept an alternative view of the world. It is my view that this does not in itself detract from the quality of the book, to the contrary: It aides the reader to know where the author is standing, what kind of world he or she is writing in and about. Thus, I wish to present my own sense of perspective in this undertaking.

This thesis is written (for the most part) at a desk at a local university in Norway. Here, in this environment, the view that society influences health, and that work plays an integral part in this process, is rather widely accepted. Norwegian society as a whole is a very different context from the USA. Norway is to a large degree a corporatist regime, where the government works in strong tripartite collaboration with labour unions and trade organizations (Østerud 2007). Norway has one of the world's strongest labour protection laws, a high unionization rate, and a strong welfare state (Levin et al. 2012) where workers are highly *decommodified* to use Esping-Andersen's (1990) term, that is: workers are strongly protected in the labour market, and not seen as commodities that can be laid off at the employer's whim.

However, the scope of the present study deals with the entire European labour market. Thus, it is a very much Norwegian perspective on Europe. This even extends to the author: I spent some ten years working as a health care assistant, and later on a skilled health labourer, at a local nursing home. For two years I was union representative at my workplace, before I went on to study sociology. This experience has definitively shaped my outlook, presumably both in conscious and subconscious ways. I ask the reader to keep this in mind.

The European labour market is a very diverse mixture, consisting of countries with different economies, resources, political regimes and cultures. I can lay no claim to know details about each of the 34 countries included in the analysis here. Thus, the thesis will be using generalizations, such as categories and typologies. Much of the aim will be investigating these generalizations and typologies, to find out whether there are systematic differences between groups of countries.

Doogan (2009) argues that western capitalist societies have seen a shift towards *neoliberalism*, roughly defined as policies towards economic liberalizations, free trade and open markets, privatization, deregulation, and enhancing the role of the private sector. Norway is not totally unaffected by the sweep of neoliberalism, and working life is changing even here. However, as of today, Norway is still very much a calm island, which has escaped

the storms affecting many European (and world) countries in the aftermath of the financial crisis that started in 2008.

Thus, the perspective is quite different from Schnall et al (2009). Rather than a single nation (certainly with variation among its many states), with a singular philosophy of individualism (in itself a very broad generalization), seen from within, I am dealing with a multitude of nations, possibly sharing some common “European” traits, seen from a very Norwegian perspective, that is a perspective where worker’s health has been a public concern for many years.

Now, to connect this to the role of values in social research, rather briefly, Weber ([1903-1917] 1949) said: “*it should be constantly made clear... exactly at which point the scientific investigator becomes silent and the evaluating and acting person begins to speak.*” Thus, Weber’s idea of *value neutrality* in research not only refers to an aim of doing objective research, but also the caution that social scientists should exercise in making value judgments. By stating the sense of perspective here, I hope the reader is made aware of my value judgments.

## **2.2. The nature of work in the 21st century**

Before proceeding, I will flesh out three concepts that are vital to the understanding of the research question. I will do this by answering three questions: What *is* work? What *are* working conditions? And finally, what *is* wellbeing?

I begin by considering what might appear a banal, yet fundamental, question: What *is* work? Merriam-Webster’s (2014a) dictionary lists no fewer than 11 definitions of the word. I will review the first definition, which captures the basic meaning of the term as applied here. Work is here basically defined as: “*activity in which one exerts strength or faculties to do or perform something*”. The term then has no less than three subdivisions:

- a) sustained physical or mental effort to overcome obstacles and achieve an objective or result.
- b) the labour, task, or duty that is one's accustomed means of livelihood.
- c) a specific task, duty, function, or assignment often being a part or phase of some larger activity.

The point I wish to make is that working, by its very definition, is something that all humans do. People have always “worked” for their survival, from the earliest hunter-gatherers, to the nomadic and residential farmers, to the industrial workers of the industrial revolution. This understanding is implicit in the first subdefinition. However, it was the

industrial revolution which brought about the widespread understanding of the second subdefinition, namely that work is separated into a social category of its own, as a means of livelihood. The modern concept of “work” is intimately tied to the rise of industrialization and capitalism. In the feudal societies of Europe, most people were bound by serfdom: They lived off the land, exchanging or bartering goods, while being obligated to work a substantial fraction of the time for their landlord, usually around 10%, or giving away a similar substantial fraction of their yield to the landlord (Doogan 2009, Morrison 2006, Polanyi ([1944] 2001).

The modern concept of work involved the commodification of labour, in that workers could “sell” their labour time to factory owners, and be paid hourly wages (Polanyi [1944] 2001). This transformation is arguably the foundation of the concept of a “modern” society, as well as a foundation of the discipline of sociology itself. Early sociologists took the transformation of work as the basis for forming their theories and analyses of modernity (Cf Ritzer & Stepnisky 2014): Marx argued that modern society was defined by the class conflict between the workers and the capitalists. Durkheim argued that new divisions of labour in society fundamentally changed the way society was held together, in what he called the change from mechanic to organic solidarity. Max Weber argued that work was a central characteristic in class positioning and determining life chances. As I will review later, Marx’s and Weber’s concepts of class are very much relevant today in terms of worker’s health and wellbeing.

In strictly economic terms, work is understood as a contractual relation, wherein a worker sells his time to an employer, and receives money in return. This definition has been criticized, in that it does not take into account that there is an asymmetry of power inherent to most work contracts: That is, the employer has more power and money than the individual worker, and in practice often defines the terms of the contract (Ellingsæter 2009:70-71). As Polanyi (1944) argued, work should thus been seen as a fundamental social relation that involves much more than an exchange where both parties maximize their profits.

The view of work as a social relation also underpins the concept of the *psychological contract*. A term originally introduced by organizational researcher Chris Argyris (1960), it was defined by Rousseau (1989) as the “*mutual beliefs, perceptions, and informal obligations between an employer and an employee*”. As I will review later on, the psychological contract in turn underpins two influential theories on work and health, namely Siegrist’s (1996) theory of effort-reward imbalance, which highlights the importance of social reciprocity in work

relations, as well as the theory on organizational justice (Hammer 2011), which can be seen as a specialized type of effort-reward imbalance.

“Work”, then, is presently mainly understood as a contractual and social relation, wherein a worker agrees to sell his time and knowledge to an employer, and in return receives money and other material and social benefits, mainly in the form of wages and salaries. The psychological contract extends the formal contractual relation. The question of power is central in the social relation.

### **2.3. Changes in the world of work**

The world of work is not a static place. Changes in the economy, in technology, in politics, in society in general, all these things and more affect the world of work. I have already pointed out some classic viewpoints on the effect that industrialization and the introduction of capitalism has had on work, but to provide some context for the current research question, I will do a very brief historical outline of two major narratives on the changes in the world of work.

Perhaps the most important grand narrative is the history of *Fordism*, shortly defined as the era of standardized mass production that characterized industrial economies for a large part of the twentieth century (Blyton & Jenkins 2007:81). A lot of concepts that we take for granted in working life originated or came to bloom under Fordism: Industrial mass employment under fixed, full-time contracts (for males), the assembly line mode of production inspired by Taylor and Fayol, the rise of an affluent working class.

The second grand narrative I will touch upon is *post-Fordism* or *postindustrialization*. The main gist of this narrative is that standardized mass production gives way to the flexible specialization made possible by new technology, the rise of the service industry and the rise of the women’s labour market (Blyton & Jenkins 2007:84). It also signals the end of the standardized full time employment contract, and the rise of the flexible and precarious labour market. This is a contested theoretical field, where for example Doogan (2009) claims that the effects of postindustrialization have been greatly overstated.

Another contextual issue is very recent: In 2008, two years before the data for this study was collected, Europe (and the rest of the world) was struck by the greatest financial crisis since the 1930s (Madsen & Øyen 2010), which has had a devastating effect for employment in Europe to this day, with unemployment rates in the EU rising from around 6.5% in 2008 to around 10.5% in 2014 (Eurostat 2014a). It is hard to tell how much of an influence this has had on working conditions at the time of the survey, but a fair assumption



would be that the countries that were the most affected by the crisis would perform worse in wellbeing scores. A popular measure of economic conjunctures is the growth rate of the Gross Domestic Product (GDP). The average GDP growth rate in the EU was -4.5% in 2009, and the countries with the largest negative growth rate were Latvia (-17.7), Lithuania (-14.8), and Estonia (-14.1), followed by Finland (-8.5), Slovenia (-7.9), Croatia (-6.9) and Hungary (-6.8) (Eurostat 2014b).

These are some of the most important contexts work and the changes in work are understood by. Moving on to the second main question from chapter 2.2, exactly what do we mean when we speak of “working conditions”?

#### **2.4. The concept of working conditions**

Eurofound (2011), coincidentally the organization responsible for collecting the survey data to be analysed here, uses the following definition of working conditions:

Working conditions refers to the working environment and aspects of an employee’s terms and conditions of employment. This covers such matters as: the organisation of work and work activities; training, skills and employability; health, safety and well-being; and working time and work-life balance (Eurofound 2011).

Working conditions are by this definition pretty much all-encompassing, they can be construed as all things that are related to work, and, by extension, to much of human existence. The link between work, health and wellbeing is present even by definition.

To make the concept of working conditions more manageable, it is usually broken down into two categories which seem to be pretty much agreed upon in the literature (cf Bambra 2011, Schnall et al. 2009, Arnold & Randall 2010, Eiken & Saksvik 2011): the *physical work environment* and the *psychosocial work environment*.

The literature is not always explicit when it comes to defining exactly what constitutes these environments. The *physical* work environment is the least ambiguous of these concepts, as it refers to the material, objective surroundings that the worker is exposed to in the workplace. The physical work environment is subdivided by Bambra (2011) into chemical, environmental (noise, vibration, injuries) and ergonomic hazards. The *psychosocial* environment can loosely be defined as nonmaterial psychological and social processes occurring at the workplace, or as a result of exposure there (ibid).

I will go into the concept of the psychosocial in some depth, in chapter 2.6. For now, I wish to highlight that these categories must be seen as analytical tools rather than objective truths. The physical might very well influence the psychosocial, and vice versa. The division

between the two is not cut and dried. For example, Bambra (2011:63-66) discusses the effects of repetitive work and shift work under the heading of the physical environment, while simultaneously referring to stressors associated with these types of work. The concept of a stressor is intimately tied to the theories of the psychosocial, as I will review in the section on stress theory, chapter 2.6.2.

Given this broad overview, I will now turn to the third main question from chapter 2.2: What is wellbeing?

## **2.5. Theorizing wellbeing**

I will lay out this chapter as follows: First, I will present the concept of wellbeing, and discuss how it relates to mental health. Then I will review the use of subjective measures in health related research.

WHO (2013b) defines mental health as “*a state of well-being in which every individual realizes his or her own potential, can cope with the normal stresses of life, can work productively and fruitfully, and is able to make a contribution to her or his community.*” WHO conceptualizes wellbeing very much as an *emotional* state of feeling cheerful, calm, relaxed, active and vigorous (WHO-5 2014). I will return to the issue of emotions in chapter 2.6.4.

Arnold & Randall (2010) state two main sources of wellbeing, both are based on ancient Greek concepts. *Eudaimonia* is a Greek word that Arnold & Randall translate into having a sense of purpose and doing something meaningful. *Eudaimonia* thus translates to work being its own reward and a source of wellbeing in itself. *Hedonism*, on the other hand, rests on the idea that wellbeing is achieved by maximizing pleasure. In this perspective, work itself has to be pleasurable, or else it can be seen as a means of receiving external rewards such as money, status or power. The two models are not mutually exclusive. I would argue the WHO definition rests heavily on a eudaimonic understanding, as it emphasises self-realization, productivity and contributing to the community.

In line with the definition of health in general, it is worth noting that the concept of wellbeing is a *positive* one: “*Health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity*” (WHO 1946). The concept of wellbeing can be placed within the emerging field of *positive psychology*, which seeks to counter the notion that psychology has been preoccupied with mental problems, and instead focuses on optimal human functioning (Christensen 2011).

When we add these definitions up, the logical conclusion is that *health is by definition a state of wellbeing*. Furthermore, WHO defines mental health as a state of mental wellbeing, separating it from the physical and the social domain. I choose to see this as more of an analytical separation than an empirical one. Mental illnesses, such as depression, can have very palpable physical effects such as increased risk of, for example, cardiovascular disease, stroke, diabetes and obesity morbidity (Penninx et al 2013), as well as social ones, such as absence of intimate partnerships, lack of social networks and job loss (Steger and Kashdan 2009).

The issue of health is thus always embedded in a physical, mental and social context. As Dahlgren and Whitehead (1991) point out, health is determined at three levels; first by the general socio-economic, cultural and environmental conditions, second by social and community networks and third by individual lifestyle factors.

Another way of viewing it, is by looking at health through Engel's (1980) *biopsychosocial* model, which posits that no disease can be understood in purely biological terms, but must always take into consideration the psychological context, for example that patients may respond very differentially emotionally to treatment, and the social context, for example that people of low income and education may not have the same access to health care as people of higher income and education.

The point I wish to make clear is that even though wellbeing is experienced at an individual level, as a psychological and emotional state, it is still subject to social determinants. Social determinants have been found to be the prime reason for inequalities in health (WHO 2008). So it follows that inequalities in wellbeing should also be attributable to social conditions.

It should be pointed out that the conception of wellbeing as a measure of mental health has been criticized. I will briefly address this criticism by citing a passage from Kecmanović, (2010):

The assessment of whether an individual is mental healthy [sic] cannot be delegated to the individual whose mental health is the object of assessment, to their estimation of whether or not they for example have a positive attitude ... A serious imperfection of such a subjective or, or more accurately, subjectivist way of assessing one's mental health, is the fallout of equating subjective wellbeing (happiness) and mental health (Kecmanovic 2010).

Kecmanović argues that subjective wellbeing might be *a* measure, but not *the* measure of mental health. The criticism goes towards the use of subjective measures of health in general, a topic I will address in the next chapter.

The criticism of wellbeing as a measure of mental health also goes towards a criticism of the whole field of positive psychology as a whole. I will not be going into this debate specifically, as it is beyond the scope of this thesis. Rather, some of these issues will be dealt with in the section on criticism of the psychosocial perspective towards the end of chapter 2.6.

When it comes to empirical research on subjective wellbeing, the general finding is that income, the state of health, employment, and social relationships are particularly important for wellbeing in Europe, with only some minor differences across countries (Fleche et al. 2011).

### 2.5.1. Wellbeing as a subjective measure

The WHO-5 is a *subjective measure of health*. The topic of subjectivism versus objectivism is major point of discussion within the philosophy of social science, and I will touch only very briefly on the basic ideas to illuminate the ramifications for this study. Ritzer & Stepnisky (2014:A-13) very briefly define the subjective as *something that occurs only in the realm of ideas*, whereas the objective relates to *real, material events*. Now, following up on Kecmanović (2010):

In the current context, there are two important considerations to be made concerning subjective measures. I will address these concerns rather briefly, as they are topics for a thesis in themselves.

The first consideration is: To what extent does a subjective measure of health reflect an underlying objective health status? The answer seems to be: it depends. The issue is complicated from the outset, as the very notion of measuring objective health data seems to be prone to subjective errors, that is, errors in reporting (Johnson et al. 2009). Next, the general finding appears to be that there is a social gradient even in the reporting of health: less educated people tend to underreport their health conditions (Mackenbach et al. 1996, Lindebom & Van Doorslaer 2004, Johnson et al. 2009).

The second consideration is closely related to the first: Are subjective health measures comparable between countries? Lindeboom and van Doorslaer (2004) suggest that “*the problem may be particularly pronounced for comparisons across cultural groups with different norms and expectations*”.

Where does that leave the current research project? Given the reservations and objections that might be raised against wellbeing as a measure of mental health, the research project might appear to be doomed at the outset. On the other hand, it could be argued that

the current data set might not be a perfect and objective source of data on wellbeing among European employees, but it is probably the *best*. To my knowledge, there is no other source of data on working conditions that is collected by asking the same questions in the same way in 34 European countries.

As the WHO World Health Report of 2001 states, the whole range of unhappiness and suffering due to poor mental health is not measurable. Quality of life measurements such as wellbeing are the best proxies available (WHO 2001). Fleche et al. (2011) also found cultural differences are not major drivers of differences in life satisfaction.

I ask the reader to take note that I will be using wellbeing as a continuous measure. This is unusual in health-related studies, which tend to focus on the dichotomy of being ill or not ill. These studies tend to use the odds ratio (OR). Very briefly, odds ratios larger than 1 indicate a higher probability of being ill, and ratios lower than 1 a lower probability (Ringdal 2007). Results from previous studies are therefore not directly comparable. We can compare the significance of the findings, and their direction, but not their magnitude. The reasoning behind using wellbeing as a continuous measure is that the concept does not delineate a clear distinction between what constitutes “good” and “bad” values of wellbeing. The issue is further reviewed in chapter 3.4.

## **2.6. Psychosocial theories**

I will begin this chapter by laying out some of the basic assumptions of psychosocial theory, and review the central concept of stress. Then I will present theories and findings on the major psychosocial models, as well as expectations for the current study, before finishing this chapter with a review of the critique of the psychosocial concepts.

### **2.6.1. Separating and fusing the psychological and the social.**

Psychosocial theories are dominant in the field of work-related health research (Bambra 2011). What exactly does the word “psychosocial” mean? Merriam-Webster (2014b) suggests that it has two specific meanings: 1.) *involving both psychological and social aspects* and 2.) *relating social conditions to mental health*.

As it happens, both of these definitions have validity in the present undertaking. However, I will try to aim for a singular definition, which necessitates some discussion.

The aim of this paper is to investigate the relationship between working conditions and wellbeing. Working conditions are things that exist external to the individual, where the individual has a limited degree of control and power over those externalities. In this regard, working conditions are very much like Durkheim’s *social facts* (Cf Ritzer & Stepnisky

2014:77). However, mental health is something that is experienced within the mind of the individual. At the individual level, workers may very well respond rather differently to the working conditions they are exposed to. This leads to a fundamental question: what is the relationship between the individual (psychic) and the working conditions (the social)? Or as Gordon & Schnall (2009:6) put it: How does the social enter the body?

The concept of the psychosocial rests heavily on the assumption that there is a dialectic relationship between the psyche and the surroundings. In psychological terms, there is a *transactional* relationship (Arnold & Randall 2010:439) between the individual and the environment. Epistemologically, you could argue that it is hard to separate them, because in terms of the social category of work, the individual is embedded in his or her work environment and vice versa.

The concept of the psychosocial, then, may not be as much about fusing the individual with, or separating it, from the environment. Instead, the point may be more about the *exchanges* and *interactions* that take place between the worker and the working environment.

More concretely, Bambra (2011:74) uses the following definition:

The ‘psychosocial work environment’ is a collective way of referring to psychological and social influences on health, such as time pressure, monotonous work, social reciprocity, job control and autonomy, fairness, work demands, job security, as well as social contact between co-workers and supervisors (Bambra 2011:74)

Furthermore, Bambra makes the sociologically relevant point that the psychosocial work environment is “*a meso-level factor, akin to family or community, which acts as a bridge between the structural and agency determinants of health*” (2011:74). This statement necessitates a clarification on the terms used for the levels of analysis. In the current study, the psychosocial work environment is considered as the micro level of analysis. I read Bambra as saying that the psychosocial exists at the interactional level, which is typically referred to as a micro level in sociological terms.

The transactional nature of the psychosocial is very much apparent in one of the fundamental concepts of psychosocial theory, namely stress. I will review this concept in some detail.

### 2.6.2. Stress

What is stress? Reviewing the literature, there seems to be no one answer to this question. I will start off by using a relatively simple definition, and then discuss points relevant to the current research.

Arnold and Randall (2010:713) define stress as “*the unpleasant, and potentially damaging, emotional state that arises when a person perceives the demands placed upon them exceed the resources available to them to cope with those demands*”.

The modern use of the word is often attributed to endocrinologist Hans Selye, who introduced the term into medicine in 1926 (Everly & Gating 2013). Selye himself continued to work on a definition of the term throughout his life. He is attributed as saying towards the end of his life: “*Everyone knows what stress is, but nobody really knows*” (Humphrey 2005:ix).

There seems to be fairly widespread agreement that stress is about individuals’ response to the environment (Bambra 2011, Gordon & Schnall 2009, Arnold & Randall 2011): The environment places demands on the individual. In stress theory these demands are referred to as *stressors*, a word that Selye himself is said to have invented (Everly & Gating 2013). Some degree of demand is seen as normal and natural, and perhaps even beneficial in psychological terms. But at some point, the individual is not able to cope with “the normal stresses of life”, and at this point, stress, understood in medical terms, occurs. The word stress, then, is usually implicitly understood to mean *unhealthy* stress.

But from there on, the concept takes on a lot of complexity. As one critic of Selye argued in 1951, based on Selye’s own writings, the argument behind the existence of stress was circular: “*Stress, in addition to being itself, was also the cause of itself, and the result of itself*” (Rosch 2002). This statement highlights the complexity: Stress can be seen as an *outcome*, as a *process* and as a *cause* (ibid.).

Arnold and Randall’s definition (2010:713) to some degree encapsulates all these aspects: Stress is a “state”, that is, an *outcome*. Stress is a *process* in that it is part of an ongoing appraisal, and a *cause* in that it can be damaging to health.

Stress can of course also be viewed from a *biological* viewpoint. The reasoning is that stress triggers the release of certain neurotransmitters, which in turn leads to physiological responses (Bambra 2011:76). I will not be following up on the biology of stress, as it lies way outside the scope of the current work.

Arnold & Randall (2010:436-442) claim that there are two main categories within psychological stress research. The *structural approach* focuses on how *external* psychosocial working conditions cause stress, and adversely affect health. Note that in psychological terms, “structural” refers to all things that exist outside the individual, whereas in sociological terms it usually refers to some kind of social structure beyond face to face interaction. Demands, control and support at work are of particular importance in the structural models,

as in the work of Karasek and Theorell (1990). The *transactional approach* focuses on the psychological mechanisms of the stress process. This approach highlights the role of perception, individual differences and coping, as well as how the individual receives feedback from the environment. Arnold and Randall place Siegrist's (1996) Effort-Reward-Imbalance model within the transactional realm. Both of these important theories will be reviewed in the next two chapters.

I will be pursuing both of these approaches. However, Gordon and Schnall (2009) make a few interesting points about the study of stress in a public health context that I find particularly salient:

### 2.6.3. The connection between stress, work and health.

Gordon and Schnall (2009) argue that stress is a fundamental pathway between the social world and the body. They propose a general model of stress consisting of six points:

- 1.) Stress is best understood as a *process* originating in environmental demands and stressors which...
- 2.) if evaluated or experienced as threatening will *trigger*....
- 3.) immediate emotional and physiological *reactions*, which if repeated and prolonged will give rise to
- 4.) biological and behavioural *effects*, which in turn can lead to
- 5.) long-term health *consequences*, such as chronic disease and eventually death.
- 6.) Throughout the stress process, other factors, either within us or the environment may protect or *buffer* people.

The model is slightly abridged from Schnall and Gordon (2009:6) to highlight the scope of this thesis.

Point one, as well as point six, can be seen as referring to the psychosocial environment, in the reference to environmental issues. Points two to five relate to the concept of wellbeing in the reference to individual experience of the environment.

Schnall and Gordon (2009:7) also address Arnold & Randall's (2010) structural/transactional axis, albeit in a slightly different way. They divide theories on stress along a subjective/objective axis. *Subjective* theories on stress tend to favour the idea that the body's reaction to stress depends on the individual's perception or appraisal of stress. A person has to experience something as stressful for it to be defined as stress. Gordon and Schnall, on the other hand, are proponents of an *objective* point of view. They see work stressors as an objective part of the work environment. *Chronic* encounters with work



stressors will lead to stress for *most* people, *most* of the time and in *most* places. They argue that recent research (Johnson 2005) shows that bodily arousal can take place even when subjects do not *report* situations as stressful. Thus, they argue that we should focus on the *stressors*, and not so much on the self-reported measures of stress. Furthermore, they argue that survey questions should be geared at evaluating *workplace conditions*, and not the *emotions* the workers subjectively experience.

In this thesis, I will be envisioning workplace conditions as having a causal effect on the emotional state of wellbeing. This might seem at odds with the position of Gordon & Schnall, but as they point out, working conditions might not be *perceived* as stressful to actually *be* stressful. The effects of working conditions need not be conscious to have a real effect on wellbeing as an *outcome*. Thus, I see my point of view as well aligned with Gordon & Schnall.

#### 2.6.4. Stress and mental health

So far, an argument has been made that working conditions are an important (and objective) source of stress, and thus contribute significantly to wellbeing. There seems to be little disagreement that stress is a universal part of the human experience, as is pointed out in WHO's (2013b) definition of wellbeing, where individuals are expected to "cope with the normal stresses of life". That begs the question: Just how much stress is unhealthy? And following up on this: To what extent does the WHO measure of wellbeing predict poor mental health? The wellbeing index is not an epidemiological measure. Rather, it is a positive measure that covers the entire spectrum of how humans experience life.

The discussion of exactly which levels of wellbeing that can be seen to constitute mental illness go beyond the scope of this paper. Given that wellbeing is not an accurate epidemiological measure, it cannot be used to predict mental illness directly. However, it makes sense to review the general effects of stress on mental health. People with low scores of wellbeing are implicitly defined as to be at higher risk of mental illness.

Dobson & Schnall (2009:113) argue that when stress becomes a prolonged or chronic experience, it can result in psychological distress. The most common diagnoses related to this distress are *depression*, *anxiety* and *burnout*. Given that this is not a medical or even psychological research project, I will not delve deeply into the medical or psychological processes. However, it makes sense to review some theory and evidence on these phenomena.

From a sociological perspective, sickness and disease are rarely seen purely as objective, biological processes, nor are they seen as entirely individual experiences. Rather,

sociology tends to favour the notion that many health related phenomena are *social constructions*, briefly defined as the way individuals and groups contribute to producing perceived social reality and knowledge (Berger & Luckmann 1966, Conrad & Barker 2010). Some illnesses are particularly embedded with cultural meaning, which is not directly derived from the nature of the condition. This shapes how society responds to those afflicted and influences the experience of that illness. All illnesses are socially constructed at the experiential level, based on how individuals come to understand and live with their illness. Medical knowledge about illness and disease is not necessarily given by nature, but is constructed and developed by claims-makers and interested parties (ibid.).

This can be recognized in the descriptions of mental health conditions. For example, the WHO (2012a) uses the following definition of depression: “*Depression is a common mental disorder, characterized by sadness, loss of interest or pleasure, feelings of guilt or low self-worth, disturbed sleep or appetite, feelings of tiredness, and poor concentration.*”

It is noteworthy that this definition exclusively describes depression by its *symptoms*, and as such, the diagnosis of depression can be seen as a social construction. This must of course not be read as implying that depressive symptoms are not real and objective facts, rather, the social construction lies in defining what symptoms constitute the diagnosis. As the WHO (2012b) also points out on the causes of depression: “*Depression results from a complex interaction of social, psychological and biological factors.*”

The use of symptoms (often clustered together) to form diagnoses has been a contentious point in the field of psychology. For example, the American Psychiatric Association has been criticized for using symptom-based diagnoses in its “Diagnostic and Statistical Manual of Mental Disorders” (DSM), leading the National Institute of Mental Health, the world's largest funding agency for research into mental health, to withdraw support for the manual. This particular incident is seen as part of a drive towards a more biologically founded understanding of the psychological field (Lane 2013).

*Anxiety* is similar to depression in that it is commonly defined as an *emotional state* with physiological signs, for example increased heart rate or sweating, where emotions are typically characterized by tension, nervousness, worry and apprehension (Dobson & Schnall 2009:115).

*Burnout* is a syndrome characterized by emotional exhaustion, a sense of depleted energy and lack of emotional resources (Dobson & Schnall 2009: 115).

Common to all these descriptions is the importance of *emotions*. Ritzer & Stepnisky (2014:365) outline two major perspectives on emotions as social phenomena. On the one

hand, the *organismic* model sees emotion as largely biological, and argues that some emotions are universally shared. This is a rather objectivist perspective on emotion. The *interactional model* argues that social factors also enter interactively into the experience of emotion. This is more of a subjectivist position, which lands mental health and mental illness in the territory of social construction.

I will return to the issue of emotions in the chapter on *emotional labour*. But I will now do a review of the psychosocial theories of the working environment, starting with the demand-control-support model, and continuing with effort-reward imbalance, organizational justice and emotional labour.

#### 2.6.5. The demand-control-support model

The *demand-control support model* (DCSM), also referred to as the *job strain* model, is a well-established concept in the field of work related health (Bambra 2011, Arnold & Randall 2010, Schnall et al. 2009). Initially, the model was established by Karasek and Theorell (1990), and included the dimensions of demand and control. **Job demands** refer to external demands placed on the worker. For example, the requirement to work hard and fast to keep up with production would be a typical job demand. By themselves, job demands are expected to increase stress. **Job control** consists of two components. First, *decision latitude* is a measure of the ability of the worker to make decisions on his own regarding work, and also the influence the worker carries in general at his or her workplace. For the assembly line worker, high job demands are thus usually accompanied by low control, whereas an independent professional, such as a private lawyer, would have a lot of control over what kind of clients and what kind of cases he or she took on. Second, *skill utilization* refers to the extent that a worker is able to apply his knowledge in his everyday work. For example, a registered nurse could wind up doing routine work and have little opportunity to apply skills, whereas he or she could also be working at an emergency ward, and face unexpected and varied circumstances every day.

Johnson & Hall (1988) expanded on this theory, and added the third dimension of **social support**. They argued that co-workers and managers were important parts of the psychosocial environment, and that their support would be important mediators to reduce the effects of stress. Eiken & Saksvik (2011) have argued that the original notion of social support ignores the possibility that workplace bullying and harassment could have a *negative* effect.

When it comes to empirical research, the DCSM has established itself as a standard reference model in the field of psychosocial research. In terms of mental health, it appears that most studies have an epidemiological focus: they focus on common mental disorders such as anxiety, depression and burnout. Stansfeld and Candy (2006) conducted a meta-review of research on the psychosocial work environment and mental health. Their finding was that all elements of the job strain model were associated with common mental disorders: low decision authority (OR 1.21), low decision latitude (OR 1.23), psychological demands (OR 1.39), job strain (a combination of high demands and low control) (OR 1.82) and low social support (OR 1.32).

In terms of the structural/transactional axis, Tennant's (2001) meta-review found that occupational stressors remained as independent predictors of depression, even taking into consideration individual differences in coping strategies. Furthermore, Dobson and Schnall (2009:120) argue that the evidence is strong that job stressors can cause depressive symptoms *even in people who have no such pre-existing symptoms* (my emphasis).

In the context of the present study, the expectation is therefore that higher job demands by themselves decrease wellbeing, while job control and social support increase it. The combination of high demands and low control ("*job strain*") should be associated with lower wellbeing. Conversely, jobs that combine high demands with high control should be associated with increased wellbeing.

#### 2.6.6. The effort-reward imbalance model

The *effort-reward imbalance (ERI) model* was developed by Johannes Siegrist (1996). It is still very much a stress-based model, but Siegrist wanted to shift the focus away from the issue of job *demands*, and focus on job *rewards*. He argued that stress in the workplace resulted from a mismatch (imbalance) between the *efforts* workers made, and the *rewards* they received from their employer, thus the name of the theory. The theory is placed in the transactional field by Arnold & Randall (2010:440), as it emphasises employee's cognitive evaluation and assessment of efforts and rewards.

The ERI is based on the concept of *social reciprocity* in the work contract. This is defined by Siegrist (2005:1033) as "*the mutual co-operative investments based on the norm of return expectancy, where efforts are assumed to be equalised by respective rewards*". A lack of reciprocity is seen as leading to stress. Note that the concept of reciprocity is closely related to the idea of distributive justice, which I will cover in the next chapter.

The employee's efforts are determined by two factors: *Extrinsic* and *intrinsic* demands (Siegrist 1996, Eiken & Saksvik 2011). Extrinsic demands are the demands placed by the employer, and as such are analogous to the demands in the DCSM. Intrinsic demands are the individual demands and ambitions or the personal motivation in the job tasks. According to Siegrist, high efforts are caused by intrinsic demands. See figure 1 below for a graphic representation.

Employer rewards are grouped in three categories: money, esteem and status control. Status control involves job security and career opportunities.

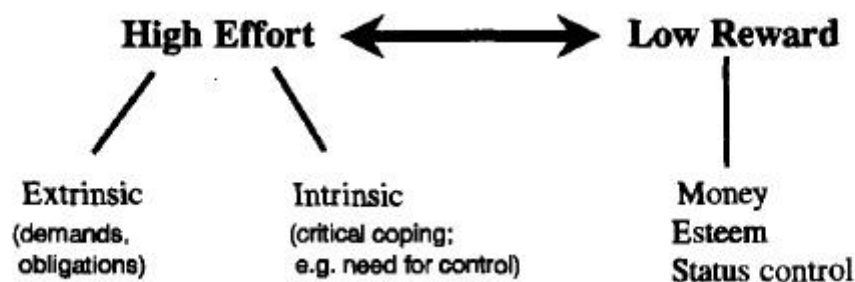


Figure 1: Effort-reward imbalance (from Siegrist 1996).

In the case of an imbalance, many employers can restore the balance by adjusting their efforts. However, there may be situations where this is not possible. Siegrist (1996) argues that three situations are particularly “toxic” in terms of a high imbalance: First, if there are no options to restore the imbalance, such as if you are in a low status job. Reducing your efforts might result in losing the job, which might be viewed as a riskier situation than maintaining their current one. Second, there might be strategic reasons for maintaining an imbalance, such as a desire for a promotion. Thirdly, Siegrist highlights *overcommitment* as a particularly important source of stress for the individual. Overcommitment is a coping strategy centred on trying to control all the factors of the environment. This is linked to psychological factors such as personality.

When it comes to the results of empirical research on ERI, Siegrist (2005:1033) himself argued in a review of longitudinal studies that “*people who experience failed reciprocity at work are twice as likely to suffer from depression... compared to those who are not exposed*”.

In terms of the relationship between the job strain model and ERI (Marmot et al. 2005), ERI was found to be better suited to assess stress in jobs featuring “person-based” interactions, typical of service and professional jobs.

Van Vegchel et al's (2005) metareview found that the "extrinsic" hypothesis was well supported: High efforts and low rewards increase the risk of poor health in general. The "intrinsic" hypothesis found more inconsistent support.

Stansfield and Candy's metareview (2006) found a connection between ERI and depression/anxiety. Studies which include both the DSCM and the ERI indicate that the ERI explains most of the variation in depressive symptoms (Dragano, He, Moebius, Jöckel, Erbel & Siegrist 2008).

Based on previous research, the expectation is that a situation where efforts are proportionally larger than rewards will negatively affect wellbeing. Previous research also suggests that ERI might be more influential towards wellbeing than the demand-control-support model.

#### 2.6.7. The organizational justice model

*Organizational justice* is a more recently developed psychosocial model. As the name implies, it focuses on fairness, justice and equity in the workplace (Bambra 2011:79). The term itself is frequently attributed to Greenberg (1987). However, Greenberg himself based his ideas on a larger number of ideas from the fields of sociology and psychology, according to Hammer (2011).

Before I delve into the details on different types of justice, the basic question is: How does the concept of justice affect health, and specifically, mental health? Or, phrased in another way, how does injustice cause stress? One possible answer to this question is to view organizational justice as a specialized form of effort-reward imbalance, as indeed Siegrist himself does (1996, 2005). He argues that a sense of unjust treatment constitutes a violation of the expectation of social reciprocity, which will affect psychological factors such as self-efficacy, self-esteem and sense of belonging, which are argued to be essential for health and wellbeing (Hammer 2011:342). There is a discussion in the literature on whether ERI and organizational justice should be seen as complementary or redundant models (Kivimäki et al 2007). Kivimäki's findings suggested that they should indeed be viewed as complementary.

This makes sense from the perspective of seeing rewards, material or nonmaterial, as a specialized form of justice. To be justly *rewarded* might not be the same as to be justly *treated*. Also, as the name implies, there is a more structural perspective to organizational justice than to ERI. As Bambra (2011:80) puts it, it can be seen as "applying more political concepts to the workplace". According to Elovaino et al. (2002:105), organizational justice points to features of the work environment such as "*organizational consistency, accuracy,*

*ethicality, managerial decision making, procedures used, and discrimination in organizations.”*

With these considerations in mind, I will now do a short review of the concept of justice as applied to the workplace, based mainly on Hammer (2011). Hammer identifies three types of justice:

*Distributive justice* is the fair distribution of outcomes. According to Homan’s (1974) exchange theory, individuals have two expectations when they are engaged in exchange. First, that the rewards you receive will be proportional to your costs. Second, your net profits will be proportional to your investment. Blau (1986) argued that fairness was learnt as a norm or value through socialization. People expected a “fair rate of exchange”, that is, a normative standard that defines what a fair reward for a service rendered is. Lerner (1975) argued individuals have a psychological need to believe that we get what we deserve, what he called “a belief in a just world”.

If our expectations of distributive fairness are challenged, we experience what Festinger (1957) called “cognitive dissonance”, that is, a state of tension that arises when we hold two cognitions that are psychologically inconsistent. This tension, then, is a source of stress.

Hammer (2011) then argues that we have developed rules or norms for distributive justice. The *equity* rule says that outcomes should be proportional to investments. The *equality* rule says that outcomes should be shared equally among recipients. The *need* rule says that rewards should be based on individual needs, and is found primarily in public welfare, according to Hammer. These rules can conflict with each other, and there is argument on what rule should have primacy. There are also cultural differences. A strong individualist culture, such as the USA, tends to favour the equity rule, whereas a more collectivist culture, such as Norway, tends to favour the equality rule. As I will argue later on in chapter 2.8.3, welfare state regimes are very much based on different sorts of assumptions of distributive justice. The same goes for the working conditions regimes, chapter 5.7.

Adams (1963, 1965) argued that people rate justice in two ways: First, people compare their outcomes to their contributions, much as the ERI suggests. Second, people make *social* comparisons using reference groups or individuals.

*Procedural justice* refers to the fairness of procedures used to determine outcomes. Hammer argues that this is a question of *perception*, which places the issue of fairness in the subjectivist tradition. To be perceived as fair, procedures should satisfy six criteria: *Consistency* means that the exact same procedures shall be used for different people at different times. *Bias suppression* requires that the decision maker’s own preferences should

not be allowed to dictate the outcome. *Accuracy* means that decisions should be made on correct information. *Correctability* means that affected parties should be allowed to respond to judgements made during procedures. *Representativeness* requires that decisions be based on opinions on all those affected by the outcome. *Ethicality* means that procedures should be in accordance with ethical and moral rules.

*Interactional justice* refers to how people are treated when they are informed about outcomes. This goes beyond a strict appraisal of gains and losses in an exchange, or whether the correct bureaucratic procedures were applied. Fairness also includes being treated with dignity and respect by the bearer of news, bad news in particular, as well as receiving adequate explanations of decisions. Hammer (2011:350-351) highlights the importance of interactional justice during organizational changes, particularly with regards to the experience of uncertainty and insecurity among workers.

In standard research on organizational justice, based on Niehoff & Moorman (1993), special emphasis is placed on the manager's role. I will apply another perspective. There are two reasons for this. First, the current data set does not contain a large number of questions on the manager's role, and those that do tend to overlap heavily with the concepts of demand, control and support. Second, Niehoff & Moorman's conceptualization rests heavily on the presumption that the manager carries the primary responsibility for justice in the workplace. My conceptualization is *institutional*, that is, I will focus on the institutional arrangements that support justice in the workplace, much in the same way that Roskam (2009) does in identifying institutions as process indicators in the Work Security Index. I would argue that the prime institutional source of justice in the workplace is employee representation.

Empirical research has shown that the relational and to some extent the procedural dimensions of justice have been found to be particularly salient in their impact on mental health (Bambra 2011:80). British civil servants exposed to poor relational justice were found to be at higher risk of mental illness after 3-5 years in the Whitehall longitudinal study (Ferrie et al 2006). The same was the case in a study of Finnish public employees in a similar study, showing correlations with symptoms of mental illness 2-4 years later (Kivimäki et al. 2007). To my knowledge, there is no research on the effects of institutional arrangements of labour unions and organization on wellbeing.

The expectation is thus that the experience of injustice in the workplace should negatively affect wellbeing. As my conceptualization is not directly comparable with previous research, further expectations are hard to define. The general theories on justice will



also serve as a framework for discussing the macro structural differences between countries, in particular with regards to welfare states and working conditions regimes.

#### 2.6.8. Emotional labour

*Emotional labour* is a relatively new concept within occupational health, and has been less researched. Dobson & Schnall (2009:122) define it as “*a particular kind of emotion that employees are paid to perform as part of their job*”. It is also referred to as “*the management of human feeling*” (ibid.). Emotional labour is typically divided into job-focused and employee-focused. *Job-focused emotional labour* refers to the frequency, duration, variety and intensity of customer interaction. *Employee-focused emotional labour* refers to the regulation of emotions.

When it comes to empirical research on emotional labour and wellbeing, the employee-focused concept of *emotional dissonance* has been identified as particularly detrimental (Hülshager & Schewe 2011). This involves the difference between the worker’s internal emotional state and the emotion that is required to be performed, in particular when this involves hiding negative emotions.

The expectation is thus that a high degree of employee-focused labour resulting in emotional dissonance should affect wellbeing negatively.

#### 2.6.9. Criticism and limitations of the psychosocial perspective.

The various models presented here, as well as the concept of the psychosocial in itself, have been criticized, particularly from the neomaterialist perspective. *Neomaterialism* can be loosely defined as the view that material living conditions are still the prime determinants of health, the “neo” prefix points towards new understandings of material inequalities in the form of diets and housing conditions, which, when added up, make substantial contributions to inequalities in health (Elstad & Dahl 2009).

Neomaterialism versus psychosocial theories echo the opposition between objectivism and subjectivism that I have touched upon before. Neomaterialists echo Karl Marx in saying that it’s the working conditions themselves that matter, and not the worker’s subjective appraisal. From a neomaterialist viewpoint, psychosocial theory lacks a structural perspective.

Interestingly, a different kind of criticism comes from the field of psychology and argues that the demand-control-support model is *too* structural, and does not take into account well enough that individuals cope differently with stress (Arnold & Randall 2010). Some

individuals might carry a preference for low demands, and it would thus be more stressful for them to be subjected to high demands than for adventure-seeking individuals.

In line with the arguments made in the introduction on the physical, social and psychological dimensions on health, I would like to argue that separating the psychosocial dimensions from the physical is hard to do in practice. The psychosocial demands of the assembly line worker are very much intertwined with the physical demands. The separation must be seen primarily as analytical, as I have argued in the case on wellbeing.

## **2.7. The physical work environment**

The physical work environment, as conceived of here, is a tangible, material world. On the one hand, it should be fairly obvious that this milieu can have tremendous influence on health in the broadest sense, somatic health in particular. Chemical hazards, noise, vibrations, injuries, ergonomics, all these factors are well known to cause health problems. With regards to mental health and wellbeing, the connection is not as clear-cut. Again, the concept of stress appears to be the crucial link between the physical environment and wellbeing.

As I pointed out previously, some parts of the work environment might not be so easily placed in the physical versus psychosocial category. Bambra (2011:65) places shift work within the physical environment, as will I in the next chapter.

However you choose to categorize it, Bambra (2011:47-48) argues that the physical work environment has been neglected in recent years. This might be due to an increased focus on the psychosocial theories. However, Bambra argues that in the EU, one in six workers might be exposed to chemicals, and a third might be exposed to noise, heavy loads and repetitive work. More than 15% of EU workers are involved in shift work. These numbers are presumably distributed differently across European countries, where recent EU member states in the East have not come as far as Western countries in implementing work security measures.

In terms of chemical hazards, the vast majority of empirical research seems to focus on somatic health, such as risk of cancer. Noise is also mostly studied in relation to somatic conditions such as high blood pressure. However, an experimental study suggests noise is a source of stress (Bambra 2011:58, Wayne et al 2002). Repetitive work emerges as a prime candidate for causing stress, however research tends to focus on musculoskeletal conditions. Shift work is another well-known source of stress. A prime reason for the negative effects of shift work appears to be the issue of *work-family conflict*, a role conflict that has been shown to be associated with higher risk of depression (Bambra 2011:66, Frone et al 1997). In terms

of the physical work environment and wellbeing, most of the research points towards a clear link in terms of somatic diseases.

The expectation for the current study is not quite as clear-cut, as there are fewer studies on the relationship between the physical work environment and wellbeing. However, the concept of stress is again identified as a crucial pathway between the outside world and the mind. The inference can be made that poor physical working conditions will negatively affect wellbeing by causing stress.

### 2.7.1. Working hours

Working hours can be seen as both a part of the physical and the psychosocial work environment, in that they are objective measures that exist outside of individual appraisal, as well as being sources of stress at an individual level. Any which way you look at it, empirical research shows that longer and unusual working hours are known to cause poor physical and mental health due to greater exposure to noxious stressors (Dobson & Schnall 2009:124-125).

The expectation is thus that overtime work and high shift work should be associated with poorer wellbeing. Expectations for part time work are uncertain.

## 2.8. Structural approaches:

A point raised by Gordon and Schnall (2009:8) is that in the context of the U.S., the dominant approach to work stress focuses on getting individuals to change their behaviours. They argue that working conditions in and of themselves, such as high demands, still place workers at higher health risks, independent of their individual life styles and health behaviours. This points forwards to the need for an alternative to individualist explanations. I will offer two such alternative explanations. I will start by reviewing the importance of social class for worker's health. Then I will review two perspectives on differences in health at the national and transnational level. The first of these is how welfare states affect health, using Esping-Andersen's (1990) well-established typology. The second is Ellen Rosskam's (2009) Work Security Index, which creates a typology of what I will call *working conditions regimes*. Current research suggests that work-related health issues might not follow welfare regime lines (Bambra et al. 2014) but rather cluster around other characteristics.

### 2.8.1. Working conditions and social class

*“Social class position is a powerful predictor of illness and death from many forms of both chronic and infectious diseases”*, says Johnson (2009:37). The concept of class is intimately tied to work, as hinted at in the introduction. As Johnson (2009:38) puts it, *“It is*

*through work, and the work of our parents, that we enter into the life chances and circumstances of a particular social class.*” I will therefore review the concept of social class and its impact on health, based on Johnson (2009), with some additional material.

The concept of class is a key issue in sociology, and therefore a point of much debate. I will present two different views on class, based on the classic division between Marx and Weber.

The classical Marxist position is subject matter in most sociology textbooks (cf Ritzer 2014), so I will make this outline rather brief. According to Marx, industrial society is by definition a class society, where the primary class division is between capitalists and proletariat, or between owners and workers. The capitalists own the factories (“the means of production”), and exploit the workers of the proletariat, who are bound to the factories as they do not own the means of production. Industrial society is thus defined by a power struggle and inherent conflict between the two classes. Johnson (2009:38) defines this as a *relational measure* of class.

The Weberian position does not take the capital/proletariat dichotomy as its foundation. Rather, Weber takes a *graded* approach (Ritzer 2014). Weber identified a new emerging class that did not fit neatly into the Marxist schema: The professional classes that did not own the means of production, but rather were in possession of intellectual capital that gave them leverage in the relations to their employers. Weber used the concept of *life chances* as the basis for class, referring to individuals’ inequality in access to social and material resources. The Weberian position has been highly influential, and forms the basis of the concept of *socioeconomic status* or *position*. Socioeconomic position is usually calculated as an accumulated score based on income, education and occupation. Johnson (2009:38) refers to this as a *positional measure* of class. This is the dominant approach in public health research, and it is the one I will use here. The argument has been made that just as in Weber’s graded approach, there is a *social gradient* in health: Common measures of inequalities in health such as mortality and morbidity are closely associated with socioeconomic position (Cf. WHO 2008).

However which way you conceptualize class, the evidence is strong that health in general is closely tied to class position. Health increases gradually with socioeconomic position, this is referred to as the *social gradient of health* (WHO 2008).

Johnson (2009:42) argues that hazardous work organization exposures are differentially distributed along class lines. This class differential may be an important part of the explanation for the class gradient in cardiovascular disease (CVD). CVDs are among the

most heavily researched topics within work-related health, but what about the relationship between working conditions, class and mental health? There seems to be relatively little research linking working conditions, class and mental health directly, so here some inferences have to be made. Psychosocial theory underpins the importance of stress in work-related wellbeing. So the question can be rephrased as: Are there class differences in exposure to stress? Research seems to indicate that this is the case, however the two most common models of work stress, the job strain and the ERI models, suggest that class should be understood more relationally than positionally: Job strain does not increase or decrease with the social gradient (Choi et al 2005). Rather, the results suggest that class characteristics are polarized: The managerial and professional class experience little job strain, whereas the working class (lower-level service, clerical, sales and manual workers) experience high job strain. Regarding ERI, the findings suggest that higher occupational grades have higher probability of reducing ERI than lower grade workers over time (Chandola et al 2005). None of these studies, however, look specifically into mental health and wellbeing.

The expectations for the current study are as follows: Based on the current knowledge, it appears that there are indeed class differences in working conditions. These differences might not follow the social gradient, but rather point towards a more Marxist understanding of class differences in working conditions and wellbeing: Upper classes of managers and professionals could report substantially higher wellbeing, compared to lower classes.

### 2.8.2. Wellbeing at the national level

The organization of the welfare state has been found to be hugely influential on population health in general (Bambra 2011:40-45). In particular, as Bambra (2011:44) points out, there has been a surge in research on the issue of health inequalities across welfare state regimes, following Mackenbach et al's (1997) ground-breaking study, which found that inequalities in mortality and morbidity were present within all Western European countries. Less light has been shed on the differences in mental health and wellbeing across Europe.

There are several issues here that need to be explicated. First, I will briefly review current theories on welfare state regimes (WSR) based on Esping-Andersen (1990), as well as suggest an alternative framework of *working conditions regimes* (WCR) based on the Work Security Index (WSI) (Roskam 2009). Then I will do a short review on measures of health and health inequalities, discussing implications for the study of working conditions and wellbeing along the way.

### 2.8.3. Welfare states and typologies

Esping-Andersen (1990) claims that the basic requirement for a welfare state is that it grants social rights to its citizens. Typically, this includes the rights to some sort of health care system, education and some system of social security. Historically, welfare states have been based upon two different principles, which are usually combined in different ways today. The Beveridge model initiated in Britain had its focus on relief for the poor, and thus set social rights at minimum levels. The Bismarck model initiated in Germany had its focus on social stability, and included generous rights for state employees to ensure loyalty towards the state (NOU 2011).

Esping-Andersens' central claim is that welfare states have developed in different ways, and the main characteristic governing these differences is the way that responsibilities are divided between the state, the family and the market. He thus created what has become a well-established typology: In the *liberal* regimes (such as the UK) the state provides only a minimum of welfare, individuals have to buy welfare services in the market. The *conservative* regimes (such as Germany) place less emphasis on the market; however, the state offers welfare on the basis of earnings. Additionally, the family has a greater role in the provision of welfare, for example in child care, which leads to a gendered labour market. The *social democratic* regimes (such as Norway) are characterized by generous state benefits, with little emphasis placed on families and markets.

Previous research has in the main supported Esping-Andersens typology, although there is discussion on which countries belong to which regimes, as well as whether the typology should be extended (e.g., Arts & Gelissen 2002). For example, Ferrera (1996) adds the *Southern* regime (e.g. Spain), a rudimentary system of welfare provision, with diverse income maintenance schemes ranging from the meagre to the generous a limited health system of partial coverage. The family and voluntary sector are prominent. Ferreras typology has proven to be the most accurate empirically within health research, according to Bamba (2011:34).

In the current context, an important issue is the inclusion of Eastern European countries. The formerly communist countries (Czech, Estonia, Hungary, Poland, Slovakia, Slovenia) have been grouped together into *Eastern* welfare regimes, however Eikemo & Bamba (2008) argue that economic upheaval have reformed them from universalist towards a more liberal system. I interpret this as meaning that it still makes sense to identify the Eastern European countries as a separate category, although the discussion points towards a

dynamic rather than a static understanding of welfare regimes; the development described by Esping-Andersen is a continuous phenomenon.

In this thesis, I will use the following typology, based on Bambra (2007) and Eikemo and Bambra (2008), see table 1 below:

*Table 1: European welfare state regimes*

<b>European welfare state regimes</b>
(ranked by levels of social protection 1-5, high–low)
1. Scandinavian (Denmark, Finland, Norway, Sweden) Characterised by universalism, comparatively generous social transfers, a commitment to full employment and income protection; and a strongly interventionist state. The state is used to promote social equality through a redistributive social security system. Unlike the other welfare state regimes, the Scandinavian regime type promotes an equality of the highest standards, not an equality of minimal needs and it provides highly decommodifying programs.
2. Bismarckian (Austria, Belgium, Germany, France, Luxembourg, Netherlands) Distinguished by its ‘status differentiating’ welfare programs in which benefits are often earnings related, administered through the employer; and geared towards maintaining existing social patterns. The role of the family is also emphasised and the redistributive impact is minimal. However, the role of the market is marginalised.
3. Anglo-Saxon (Ireland, UK) State provision of welfare is minimal, social protection levels are modest and often attract strict entitlement criteria; and recipients are usually means-tested and stigmatised. In this model, the dominance of the market is encouraged both passively, by guaranteeing only a minimum, and actively, by subsidising private welfare schemes. The Anglo-Saxon welfare state regime thereby minimises the decommodification effects of the welfare state and a stark division exists between those, largely the poor, who rely on state aid and those who are able to afford private provision.
4. Southern (Greece, Italy, Portugal, Spain) The southern welfare states have been described as ‘rudimentary’ because they are characterised by their fragmented system of welfare provision which consists of diverse income maintenance schemes that range from the meagre to the generous and welfare services, particularly, the health care system, that provide only limited and partial coverage. Reliance on the family and voluntary sector is also a prominent feature.
5. Eastern (Bulgaria, Croatia, Czech Republic, Hungary, Lithuania, Latvia, Poland, Slovenia, Slovakia) The formerly Communist countries of East Europe have experienced the demise of the universalism of the Communist welfare state and a shift towards policies associated more with the Anglo-Saxon welfare state regime notably marketisation and decentralisation. In comparison with the other member states of the European Union, they have limited welfare services.
For a map showing the typology visually, please refer to figure 2a, chapter 2.9.
<i>Adapted from Bambra (2007), Eikemo and Bambra (2008).</i>

Just *how* does the organization of the welfare state influence public health? Bambra (2011:41) points towards several possible explanations: policies aimed at narrowing income equalities, policies towards gender inequality, policies towards social cohesion and integration – all influence public health. Bambra (Bambra 2011:41) also highlights Wilkinson and Pickett's (1990) theory that higher levels of social equality in and of themselves are beneficial to population health. However, Bambra (2011:41) argues that one must take into consideration "*the entire approach to accumulation, legitimation and reproduction*".

In terms of mental health, Carpenter (2000) argues that one must consider the way the mental health care system is organized, as well as the larger social discourse. This is a subject worthy of a lengthy treatise of its own. But to put it briefly, different welfare regimes have had different policies towards organization of mental health care. Traditionally, mental health care was given in the asylum. Carpenter argues that a number of factors have led to the deinstitutionalisation of mental health care, with more of mental health care taking place in the secondary care system within local communities. This can be seen as a "normalization" of mental illness, however it can also be seen as a part of a rationalization process to cut costs and to reintegrate people into the labour market. Differential access to mental health care across welfare regimes might influence public mental health, although the causal direction might not be so easy to identify.

I would like to add another perspective. At the individual level, the psychosocial theories highlight the importance of stress. How could the organization of the welfare state influence the occurrence of stress, specifically in the field of work? I would like to suggest that the answer lies in the concepts of commodification and decommodification of labour. As I have pointed out previously, Marx and Polanyi both saw the commodification of labour as harmful to the human condition. As Polanyi put it:

Labor is only another name for a human activity which goes with life itself, which in its turn is not produced for sale but for entirely different reasons...(Polanyi [1944] 2001:75)...  
The alleged commodity "labor power" cannot be shoved about, used indiscriminately, or even left unused, without affecting also the human individual who happens to be the bearer of this peculiar commodity (ibid:76).

Esping-Andersen's (1990) decommodification can thus be seen as a reversal of the stressful commodification process, and welfare states thus protect against stress.

Another perspective would be to see the welfare state as an institutional mechanism for justice. Esping-Andersen (1990) claimed that the welfare state was by nature a system of stratification. All welfare states have to deal with the issue of the poor. As I have touched



upon already, there are two main strategies undertaken to deal with poverty. One is the Beveridge based model of needs-based transfers to people below the poverty line, the other is the Bismarck based model of universal access to welfare services based on earnings. The issue of which system is most effective in reducing poverty has been a major point of discussion among social scientists for many years (Korpi & Palme 1998). The evidence points towards the social democratic regimes as being most successful at reducing poverty and social inequality, particularly in the field of health (Bambra 2011). It follows that a higher sense of fairness and justice in the Scandinavian countries should contribute to less stress and a higher sense of wellbeing at the national level.

Empirical research on the relationship between welfare states and health has been relatively widespread in later years. Different studies use different measures of health; infant mortality rates, low birth weight, life expectancy and self-reported health (Bambra 2011:40-41). The tendency across studies is still the same: Scandinavian countries rate on top on most measures. Then there is a gap, where the liberal, conservative and southern countries cluster somewhat together, scoring slightly differently across various measures. Eastern countries tend to perform drastically worse on most measures compared to the rest (Bambra 2011:42-43).

The current thesis probably has the most in common with studies on self-reported general health, such as Eikemo et al. (2008). It has proven harder to find studies dealing with the issue of mental health and wellbeing across welfare regimes, even for specific mental illnesses such as depression, anxiety and burnout.

Dragano, Siegrist and Wahrendorf's (2011) study among older European employees found that in the Liberal and Southern welfare regime, effects of quality of work on depressive symptoms were relatively strongest.

Leveque et al (2011) found that the link between hardship and depression increases with age in Southern and Eastern European countries and decreases with age in strength in Anglo-Saxon welfare states.

The expectation for the current study, based on previous research, is that the degree of workplace stress varies by welfare states, due to the various degrees of decommodification between regimes, and the differences in distributive mechanisms. The notion of decommodification implicitly suggests that working conditions are better in the Scandinavian regimes, getting progressively worse through the liberal, conservative, southern and eastern regimes.

#### 2.8.4. Working conditions regimes

Recent research (Bambra et al. 2014) has suggested that work-related health outcomes might not cluster around welfare state regimes. Rather, there might be other mechanisms at play that form the basis of a new typology of what I will refer to as *working conditions regimes* (WCR). This typology is based on the Work Security Index (WSI), as presented by Ellen Rosskam (2009). The original purpose of the index is “*an attempt to create a benchmarking system for identifying how well a country is performing at a national level, relative to others, in providing work security to its employed population*” (Rosskam 2009:315).

The concept of *work security* needs to be fleshed out. In response to the changing nature of work in the 21st century, Rosskam argues that work security should be seen as a *universal right*, and should include a number of protections against accidents, discrimination on the basis of gender or ethnicity, violence etc. There should also be positive protections such as provision of paid sick and maternity leave, health and safety regulations, and restrictions on night work to name a few (Rosskam 2009:314).

Rosskam argues that occupational health and safety should be monitored beyond the level of the individual workplace, because systems of surveillance often do not exist in workplaces, and if they do exist, they do not by themselves contribute to national level measures of worker protection (2009:315).

##### 2.8.4.1. The Work Security Index

I will now describe The Work Security Index (Rosskam 2009), which is the basis for the typology of working conditions regimes. The WSI is derived from information on 95 countries. Three groups of indicators were used to create the index.

First, there are 11 *input indicators* based on the institutional or legal elements necessary for work security (Rosskam 2009:317). These consist of relevant International Labour Conventions (legally binding once ratified) on the protection for pregnant and disabled workers, limiting working time and night work, providing paid vacation, as well as scores based on national laws on: occupational health and safety, establishment of occupational health services, protection against discrimination based on gender, ethnicity or disability, maternity protection and paid vacation leave. International Labour Conventions provide *minimum* standards, and national laws might be in place even if a country might not have ratified a convention.

Second, there are three *process indicators* which measure whether the essential mechanisms or structures are in place to implement the laws and regulations contained in the input indicators (Rosskam 2009:318). The first is the level of government expenditure on worker's compensation, which is often indicative of whether a structure is in place for workers to make claims. The second is the existence of disability or invalidity benefits provided to workers injured in work-related accidents, and the third is the existence of bipartite or tripartite occupational health and safety boards or committees.

Third, there are five *outcome indicators* in the index, used to gauge whether a country is actually and effectively implementing laws and regulations (inputs) and whether mechanisms and structures (processes) work as they should (Rosskam 2009:319). The indicators are: work related fatal injury rate, estimated levels of fatal injury under-reporting, the share of wage employment out of total employment, average working time and annual paid leave.

The index was scored by summing input, process and outcome scores, with outcome given double weight in the scoring.

Interesting in this context, the index is based on clustering countries according to their degree of performance on the various indicators. Thus, the WSI has a conceptual similarity with the welfare regime theory. Four distinct clusters were identified, which I will refer to as *working conditions regimes* (WCR).

*Pacesetters* include countries that rank high on all three indicators, and can be seen as models in achieving a high level of work security. The cluster is made up entirely of Western European countries, with strong legislation, effective mechanisms and good outcomes. Pacesetter countries included here are: Belgium, Denmark, Finland, France, Germany, Italy, Luxembourg, Netherland, Norway, Portugal, Slovenia, Spain and Sweden.

*Pragmatists* include countries that perform well on the outcome indicators, but poorly in the input and process indicators. These countries may have weak or non-existent legislation to protect worker's health, yet they still perform rather well in outcomes. Pragmatist countries included here are: Austria, Czech Republic, Estonia, Greece, Hungary, Ireland, Latvia, Lithuania, Poland, Slovakia, and UK.

*Conventionals* include countries that perform poorly on outcome indicators, yet do well on the input and process indicators. Laws and regulations are in place, but are not put into practice. Conventional countries included here are: Croatia.

*Much to be Done* (MTBD) countries perform poorly on all three indicators. Alarming, two thirds of all the 95 countries in the index fell into this cluster. MTBD countries in the EWCS are: Albania, Bulgaria, Romania and Turkey.

The regimes are shown on a map in figure 2b, chapter 2.9.

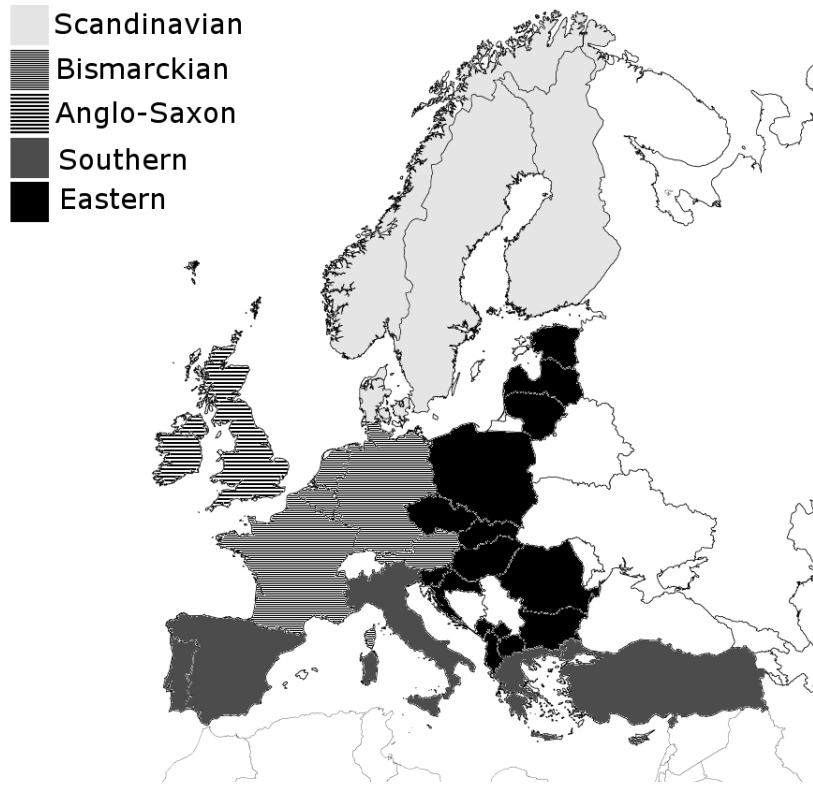
From a Norwegian perspective, Norway had ratified 105 conventions by 2002, 89 of which were in force, compared to 84 ratifications and 65 in force in the UK, and 30 ratified and 23 in force in Albania (ILO 2003). Norway introduced the world's first national work environment act in 1977, placing limitations on working hours, has a state work directorate with policing authority, over 50 weeks of maternal/paternal leave, four weeks of paid vacation, with one additional week included in many tariff agreements. Norway also has a high degree of union membership, as well as strong tripartite collaboration (Levin et al 2012). This is in stark contrast to the conditions in some of the countries of Eastern Europe. For example, as of 2004, Latvia had no restrictions on hours of work or night work, no maternity protection, no laws against discrimination of workers, a high level of injury underreporting and no establishment of occupational health services (Roskam 2009:324).

When it comes to empirical research, the Work Security Index is a relatively new measure, and to my knowledge, Bambra et al's article (2014) is the first study to review health differences between working conditions regimes. Their somewhat surprising finding was that there was no evidence that the Scandinavian welfare regime protected against the adverse health effects of poor working conditions. However, the typology based on the WSI did produce significant results between the working conditions regimes.

Thus, an alternative expectation to the welfare regime theory is that the Pacesetters will do best, followed by the Pragmatists, Conventionals and the Much-to-be-done countries. There is a possibility that the WSI might be a better instrument to differentiate between the effects of working conditions in Europe.

## **2.9. Comparing the welfare states and working conditions regimes.**

Figure 2 below shows the two typologies compared on a map. Countries in white are not part of the analysis.



*Figure 2a: Welfare regimes.*



*Figure 2b: Working conditions regimes.*

## **2.10. Control variables: demographics and previous health.**

This study focuses on the effects of working conditions, and due to a larger number of work-related theories, the number of control variables were kept limited. Income is seen as indirectly captured in the class analysis, the same goes for education, as the ISCO-88 I based on skill levels. Unemployment is not an issue here, and the effects of social relationship are limited to the effects of social support at work. *Women* are expected to report lower wellbeing than men (Boye 2009), and Boye also reports that wellbeing is expected increase with *age*. I will not theorize these further here, as the primary issue is the general theories on the working environment, of which none of the included have a specific interest in the questions of age and gender.

Next, it is fair to assume that *pre-existing health concerns* influence wellbeing substantially. In particular, reported depression, anxiety and burnout are by definition indicators of poor mental health. Somatic illness is also highly associated with poor wellbeing (Cohen et al. 1998). I will therefore create a measure of baseline health. As this measure will be based on self-reported data collected at the same time as the rest of the survey, it depends on patient recall. This is a common method in epidemiological studies, but it is known to be potentially subject to upward bias, meaning that pre-existing health conditions may be overstated (Wilson et al 2012).

Including these measures might very well reduce the effects of the other variables, as excluding them would inflate the same effects. The aim of this study is to study the general effect of working conditions on wellbeing, and I have thus found it most useful to report the effects of known health conditions separately.

## **2.11. Theoretical summary and analytical model**

Summing up the theories so far, we have reviewed the micro level psychosocial theories of demand-control-support, effort-reward imbalance, organizational justice and emotional labour. These can be seen as embedded within the physical environment. Social class has been proposed as a meso level factor beyond the individual level. Two macro level approaches have been suggested, the welfare state typology and the working conditions regimes. Wellbeing can be seen as embedded within all these levels. Thus, we get a model that is analogous to Dahlgren & Whitehead's (1991) health model. I will call this the Work & Wellbeing model, which is illustrated below in figure 3.

Take note that although organizational justice is shown here at the first level, my interpretation of justice goes beyond the source material, and that justice can be seen as a phenomenon beyond the individual and organizational level, and influence wellbeing even at the macro level.



*Figure 3: Work & wellbeing model.*

The expectations can be summed up briefly in this way. For the individual level theories: high job demands, effort-reward imbalance, low organizational justice, high emotional labour, challenges in the physical environment, long and irregular working hours – all these things will contribute negatively towards wellbeing. Wellbeing is expected to improve either relationally or positionally according to the position in the class hierarchy. Wellbeing is expected to vary between either welfare or working conditions regimes, with either Scandinavian or Pacesetter countries on top and Eastern or Much-To-Be-Done countries at the bottom.

### **3. Methods and data**

I will start off by presenting the research design, the data source and the sampling strategy employed. Next, I will describe the selection and coding of items for the analysis. After this, a presentation on the scoring of items, as well as a discussion on validity, reliability and generalization follows. At the end of this chapter, I will review the theory on multilevel analysis.

#### **3.1. The quantitative research design**

I will now do a brief review on the choice of research design. As Ringdal (2007:93) points out, any short and stylized description of research methods is always too simple, so this is a very general overview.

As should be clear from the presentation of the concept of wellbeing, I will be using a quantitative research design. The study is based on a cross sectional survey. The design was chosen due to interest in comparing working conditions in Europe. According to Bamba (2011:48), the current dataset is a unique source of comparative information.

As Ringdal (2007:91) points out, a quantitative strategy builds on the epistemological basis of seeing social phenomena as stable, making measurement meaningful. Also, quantitative designs tend to be theoretically driven and deductive in nature. Causal explanations are emphasised, as opposed to the inductive strategy favoured in qualitative research, which also favours intentional explanations. As theories on working conditions are relatively well developed, a quantitative design fits well in. The research question also implies a search for causal explanations. The choice of research design thus seems well founded. That is not to say that a qualitative research design based on interviews or observation, based on induction, a search for intentional explanations or interpretation of meaning could have yielded interesting data on working conditions and wellbeing.

#### **3.2. Data**

The data was drawn from the 2010 European Working Conditions Survey (EWCS 2012), which is a cross-sectional representative survey organized by the European Working Conditions Observatory (EWCO 2013), using a multistage, stratified random sampling method, with an overall response rate of 44%, ranging from 31% in Spain to 74% in Latvia. The survey covers 34 countries, all of which were included in this analysis. The data was supplied by the UK Data Service (2014).



The sample was primarily chosen on the basis of respondents identifying themselves primarily as *employees*. Self-employed workers, with or without employees, were excluded from the analysis. The chief reason for this is that a large number of theoretically interesting questions relating to the psychosocial work environment were only asked employees.

It is in my view an unnecessary shortcoming of the data that only employees were asked some of the questions. A slight rephrasing of the questions could accommodate all groups of workers. For example, Siegrist (2013) has changed a question in his ERI questionnaire from “*I receive the respect I deserve from my superiors*” to “*I receive the respect I deserve from my superior or a respective relevant person*”.

The items were coded and tested in SPSS 21. The multilevel analysis was carried out in Stata 13.

### **3.3. Missing data, mean imputation and final sample size.**

Several of the variables in the analysis are scales and indices. The default method of listwise deletion in SPSS while coding posed a serious challenge, as thousands of cases were deleted. To deal with this, the method of mean imputation was applied. This involved substituting missing values with mean values of the remaining items. A criterion was established wherein at least half the items had to be included to produce a mean value, in accordance with Ringdal (2007:34). In the case of wellbeing, this meant that at least three out of five items had to be included to avoid case deletion.

There are several more advanced imputation techniques available, but it was beyond the scope of the current undertaking to explore all these possibilities. Acock (2012) lists two serious limitations to mean substitution. One, there may be systematic differences between those who answer an question and those who do not, as people who answer are more likely to have average values than those who do not answer, meaning that scores appear to be nearer the average than their true value. Two, this drastically reduces variance and the explanatory power of the computed variable.

On the other hand, I would argue that the implications of using listwise deletion are very much the same. If missing data are correlated with more extreme responses, listwise deletion will also reduce the variance of the data set. The decision was therefore made to stay with imputation by mean values.

Filtering out due to missing items yielded a total sample size of 32.366. The number of respondents from each country varied from 420 to 3040, with an average number of 952.

### 3.4. Measuring wellbeing

The WHO has developed an index to measure mental wellbeing, known as the WHO-5 wellbeing index, which is widely used and has been reported to have high validity in a wide range of applications (Bech 2004), although there is still ongoing research into its usefulness. See for example Hajos et al (2013) for a discussion on using the WHO-5 on diabetes patients, or Löve et al (2013) for its use in a Swedish cultural context. Both studies found the WHO-5 to be psychometrically sound.

The WHO-5 consists of five items, asking respondents to indicate whether over the last two weeks they have felt: 1) cheerful and in good spirits, 2) calm and relaxed, 3) active and vigorous, 4) woke up feeling fresh and rested and 5) their daily life has been filled with things that interest them. The responses are Likert scale items ranging from “All of the time” (scoring 5 points), “most of the time” (4 p.), “more than half the time” (3 p.), “less than half the time” (2 p.), “some of the time” (1 p.) to “at no time” (0 p.). A maximum score of wellbeing thus adds up to 25 points, whereas a total lack of wellbeing adds up to zero. The distribution of the wellbeing scale is presented below in figure 4. The grand mean for employees in all 34 countries is 15.46 (N=32.366, SD 4.90). In terms of internal consistency, the current measure has a Cronbach’s alpha of 0.881, making it a reliable measure in statistical terms (Ringdal 2007:87). I will summarize the issue of validity in chapter 3.8.

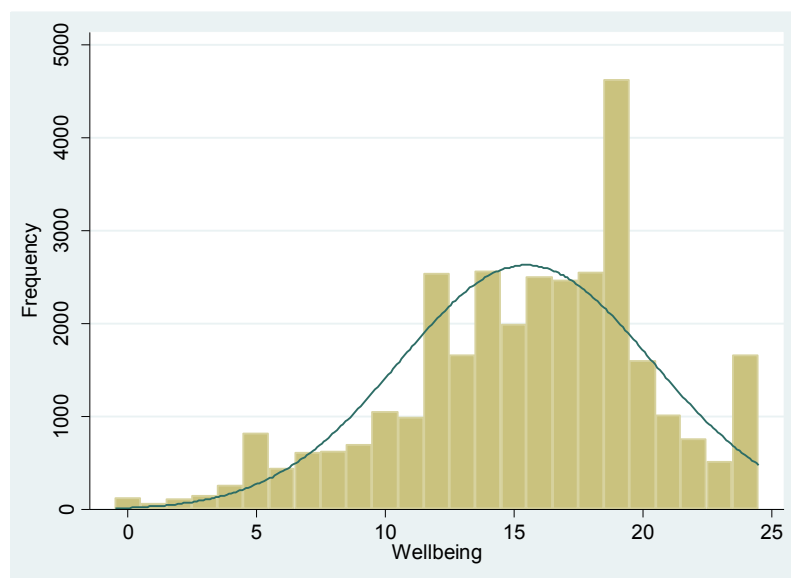


Figure 4: Distribution of wellbeing among employees in the EWCS.

A brief note on the relationship between wellbeing and mental illness: Bech (2004) suggests that a raw score below 13 on the wellbeing scale is grounds for further investigation.

In the current sample, this includes some 22% of respondents, which does cause some grounds for concern.

#### 3.4.1. A note on the measures of health and inequality

Although the psychosocial theories, such as the DCSM, operate at the individual level, there is still an implicit notion of social inequality present. Karasek and Theorell (1990) hypothesized that health was dependent on occupational status: The higher the occupational status, the better the health. The lower the status, the less control and the more demand is experienced by the worker. As such, the DCSM is a theory of health inequality, in that it refers to the systematic difference in health between socioeconomic classes (Bambra 2011:12).

Medical literature tends to favour objective measures of health, such as morbidity or infant rate mortality (Bambra 2011: 15). Wellbeing is a self-reported measure, and as I have noted in the section on wellbeing theory, there is some discussion on the use of self-reported health measure in cross-national comparisons.

However, there is also the issue of absolute vs. relative measures of health. Wellbeing, as conceived here, is an absolute measure in that it predicts the actual outcome at the individual level, on a scale. Relative inequality measures compare the percentage difference in ill health or mortality between groups (Bambra 2011:16). Mackenbach and Kunst (1997) discuss no fewer than twelve such measures of health inequality. The question on inequality in wellbeing is theoretically very interesting, but it is beyond the scope of the current work to investigate this further.

As the issue here is the effect of working conditions on wellbeing, I will for now stick to the absolute measure, keeping in mind the possible limitations of such a perspective. Using the absolute measure, we can't measure inequalities in wellbeing within countries. We can also not tell whether these inequalities are larger or smaller in one country compared to the other.

### 3.5. Operationalizations

I will now review the operationalizations of all the explanatory variables. I will review issues of validity for each of them, and summarize the findings in chapter 3.8.

#### 3.5.1. Operationalization of the DCSM

The theoretical concepts of job demands, control and social support are relatively simple. But what exactly constitutes a job demand? According to Bambra (2011:77), job

demands can be conceptualized as time pressure, high work pace, high work load and conflicting demands. Job control includes decision authority (control over workload), and skill discretion (variety of work and skill development and utilization). Support includes support at the individual level from colleagues and supervisors. The EWCS does not identify these concepts in the questionnaire, so they have to be constructed.

The Center For Social Epidemiology (2013) lists some typical items that are used to measure job demands and job control, see table 2 (next page). The Center For Social Epidemiology bases its work on Karasek et al's (1998) Job Content Questionnaire (JCQ). This questionnaire is copyrighted, and I have not been able to secure a copy. There are both similarities and differences in the approach of the EWCS and the JCQ. The items appear to be fairly similar across both surveys. However, the JCQ bases its survey on Likert scales with 4 options, whereas the EWCS uses a combination of dichotomous items and items with 4-7 options. The scoring systems are thus not compatible.

The items were examined using SPSS version 21, with the intention of creating summated rating scales for job demands, control and support. A true rating scale needs to be *unidimensional*, that is, all the items included in the scale need to relate to the same underlying latent variable (Ringdal 2007). The items were thus subjected to a *principal components analysis* (ibid.), defined as a analysing set of observations of possibly correlated variables with the intention of combining them into a set of values of linearly uncorrelated variables called principal components.

#### 3.5.1.1. DCSM: Principal components analysis

Items for the intended scale were selected on a theoretical basis, using items similar to available items from the JCQ, and subjected to a principal components analysis (PCA) (Ringdal 2007). According to Ringdal (2007:324), a PCA should ideally be done on continuous variables. However, Ringdal argues that it is common to apply PCA to ordinal variables, as long as they are assumed to measure an underlying continuous variable, which the constructs of demand, control and support very much can be argued to be. The question of whether it is acceptable to include dichotomous items in a PCA is a matter of some debate, but Kolenikov and Angeles (2005) state that discrete data do not pose major problems.

The results from the PCA are interesting, in that the selected items for job demands are reported as containing three separate dimensions, skill utility contains two, social support contains two and decision authority contains no less than four separate dimensions. The results are summarized in table 3. The items are grouped according to their components in

Table 2: Demand and control items (Center For Social Epidemiology 2013)

<b>Psychological job demands</b>
My job requires working very fast
My job requires working very hard
I am not asked to do an excessive amount of work*
I have enough time to get the job done*
I am free from conflicting demands that others make*
<b>Job control (the sum of equally weighted subscales a and b)</b>
<i>a) Decision authority</i>
My job allows me to make a lot of decisions on my own
On my job, I have very little freedom to decide how I do my work*
I have a lot of say about what happens on my job
<i>b) Skill utilization</i>
My job requires that I learn new things
My job involves a lot of repetitive work*
My job requires me to be creative
My job requires a high level of skill
I get to do a variety of different things on my job
I have an opportunity to develop my own special abilities
<i>(Items marked * are scored in reverse)</i>

table 3 (next page), based on factor loadings of 0.4 and above, in accordance with Ringdal (2007:327).

### 3.5.1.2. DCSM: Creation of the indices

The implication from the principal component analysis is that as far as the EWCS data go, job demands, job control and social support are not underlying latent variables, and can thus not be expressed as true scales (Ringdal 2007:319). They can, however, be *indexed*. An index is a measure where the indicators shape or cause the latent variable (ibid.).

Even though the factor analysis revealed that one or two items were statistically sufficient to create the indices (based on factor loadings > 0.4), as many items as possible were included. This was done to make the indices more robust against the effects of mean imputation, and to capture as much variance as possible. In the case of component 1 of the job demands index, for example, this meant including six items.

All the items were scored in the same direction and scaled in the same range, to coincide with the widest range of the items. For example, an item in one of the components might be scored 0 to 6. Thus, dichotomous items were given the values of 0 or 6 to be equally weighted in the summation of the index.

The components were then weighed equally and summated, creating indices for job demands, job control and social support, all ranging from 0-24.

*Table 3: Components of the DCSM factor analysis*

---

***Job demands components***

**Component 1**

- Is your pace of work dependent, or not, on the work done by colleagues?
- Is your pace of work dependent, or not, on numerical production targets or performance targets?
- Does your main paid job involve meeting precise quality standards?
- Does your job involve working at very high speed?
- Does your job involve working to tight deadlines?
- Is your pace of work dependent, or not, on automatic speed of a machine or movement of a product?

**Component 2**

- How often do you have to interrupt a task you are doing in order to take on an unforeseen task?
- How often have you worked in your free time in order to meet work demands? (Last 12 months)
- You have enough time to get the job done (Reversed from original item.)
- You experience stress in your work.
- Your job requires that you hide your feelings.
- Is your pace of work dependent on direct demands from people such as customers, pupils, patients, etc?

**Component 3**

- Is your pace of work dependent, or not, on the direct control of your boss?
- 

***Job control: Decision authority components***

**Component 1**

- Are you able to choose or change your order of tasks or your methods of work?
- Are you able to choose or change your methods of work?
- Are you able to choose or change your speed or rate of work?

**Component 2**

- How are your working time arrangements set? (Reversed from original item)
- (Is there) Difficulty taking an hour or two off during working hours to take care of personal or family matters?
- You have a say in the choice of your working partners.
- You can take a break when you wish.

**Component 3**

- Generally, does your main paid job involve assessing yourself the quality of your own work?
- You are able to apply your own ideas in your work.
- You can influence decisions that are important for your work.
- Generally, does your main paid job involve solving unforeseen problems on your own?

***Job control: Skill utility components***

**Component 1**

- Generally, does your main paid job involve monotonous tasks? (Reversed )
- Your job gives you the feeling of work well done.
- You have the feeling of doing useful work.

**Component 2**

- Generally, does your main paid job involve complex tasks?
  - Generally, does your main paid job involve learning new things?
- 

***Social support components***

**Component 1**

- Your immediate manager / supervisor - Encourages you to participate in important decisions.
- (You are) Involved in improving the work organisation of your department.
- Your colleagues help and support you.
- Your manager helps and supports you.
- You are consulted before targets for your work are set.

**Component 2**

- In general, your immediate manager / supervisor - Respects you as a person.
  - In general, your immediate manager / supervisor - Is good at resolving conflicts.
  - In general, your immediate manager / supervisor - Is good at planning and organising the work.
-

For the **job demand index** ( $M=10.10$ ,  $SD=4.30$ ), the first two components were used. The third subcomponent was dichotomous, and thus skewed the distribution seriously. It was decided that it was better to drop the third component altogether to retain the relatively normal distribution of the index.

For the **job control index** ( $M=14.05$ ,  $SD=4.67$ ), two subindices were created. The first subindex was for *decision authority*, the second subindex for job control was *skill utilization*. The decision authority and skill utilization subindices were then equally weighted and summated to create the final job control index.

For the **social support index** ( $M=17.94$ ,  $SD=5.28$ ), two components were included. The items “your manager helps and supports you” and “your general manager respects you as a person”, were interestingly enough singled out as belonging to separate components. Also interesting is the fact that the analysis did not differentiate between support from coworkers as opposed to managers.

Ringdal (2007:335) argues that it does not make sense to compute reliability scores such as Cronbach's alpha for indices, and that the content validity is based on a subjective assessment by the researcher (Ringdal 2007:87). My subjective assessment is that the various components do indeed relate to the theoretical concepts of demand, control and support, although the distinctions between them can be a matter of debate. For example, for the skill utility components of job control, component one could easily be seen as a measure of job satisfaction in general, whereas component two could be seen as measure of satisfaction with job variety.

Distributions for the three indices are shown below in figures 5-7.

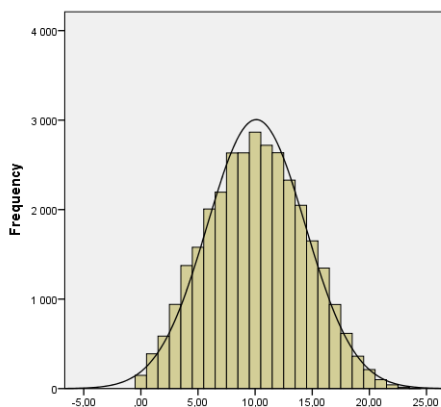


Figure 5: Job demands distribution.

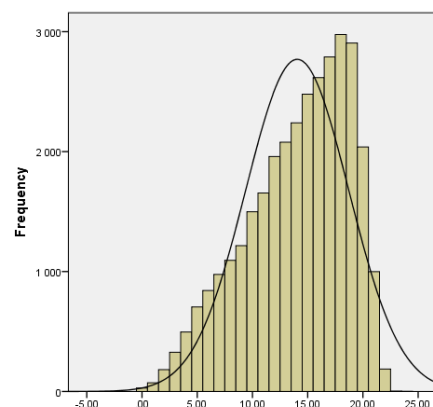


Figure 6: Job control distribution.

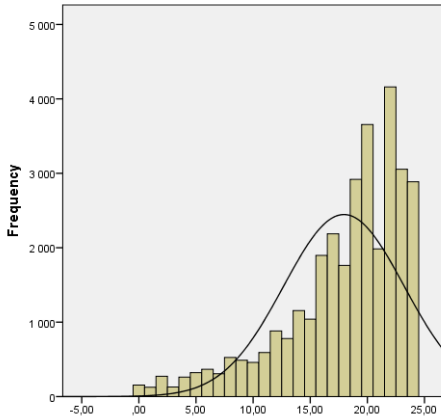


Figure 7: Social support distribution.

### 3.5.1.3. DCSM: Discrimination and harassment

In addition to the Social Support index, two indices were created to highlight the possible role of *negative* social support. First, an index was created on a series of yes/no questions on discrimination in the work place. The items covered discrimination on the basis of age, ethnicity, nationality, gender, religion, handicap or sexuality. (Take note that this could easily have been theorized as organizational justice, as it refers to unfair treatment in the workplace.) The items were summated to form an index of 0-7, using mean values of at least four answers for missing items. Due to an extremely uneven distribution, shown below in figure 8, it was decided that it was a better solution to dummy code all respondents answering yes to one or more discrimination questions into one group.

Second, an index was created on the issue of *harassment* in the workplace. Six yes/no items covered verbal abuse, unwanted sexual attention, threats, physical violence, general harassment and sexual harassment. Mean values of at least four items were used to create a summated index ranging 0-6. This distribution also proved to be extremely skewed, as shown in figure 9, and scores of one and above were dummy coded into one group.

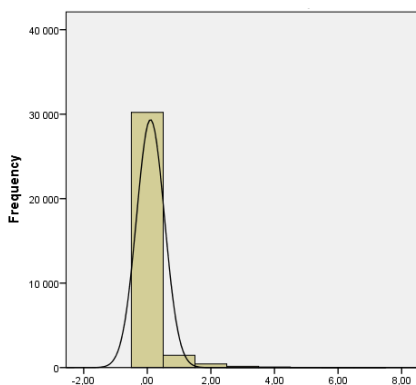


Fig. 8: Original index of discrimination

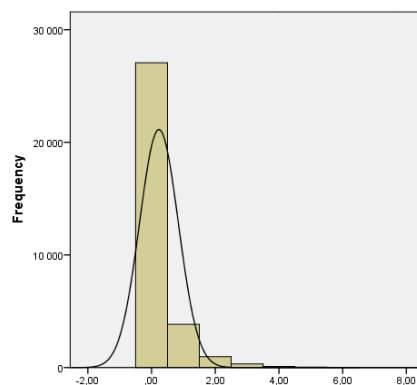


Fig. 9: Original index of harassment



### 3.5.2. Operationalization of effort-reward imbalance

Due to limitations in the data material, I will not be able to provide a standardized measure of ERI, but rather a proxy measure. The issue of overcommitment, for example, will not be analysed, as the data set did not include any fitting items.

ERI is a simple enough concept, in that it theoretically represents a relationship between efforts and rewards. For example, if a person scores a total of one on efforts and one on rewards, efforts and rewards are in balance. This can be described as a fraction of  $1/1=1$ . Following this, any efforts that are *less* than one, for example 0.9, while keeping rewards the same, results in a relationship of  $0.9/1=0.9$ . This must be understood as a *positive* ERI. Conversely, if efforts are increased to 1.1, while keeping rewards the same, the relationship is  $1.1/1=1.1$ . A number *larger* than one must thus be seen as a *negative* ERI. An *increase* in the ERI ratio should therefore be expected to *decrease* wellbeing.

How do you measure ERI? This is not as simple. Siegrist (2013) has developed a specific questionnaire to measure efforts and rewards, which has been psychometrically tested and validated. The EWCS does not use this standardized questionnaire. Based on the available items, I have therefore constructed a version of ERI that is inspired by Siegrist.

The original ERI questionnaire has six items that covers efforts, which are used to create a summated efforts scale. For the reward scale, Siegrist has devised three subscales measuring esteem, promotion and security. The ERI questionnaire uses Likert items with four categories ranging from strongly agree to strongly disagree. The ratio between efforts and rewards is then multiplied by a correction factor to adjust for unequal number of items, resulting in scales with different ranges.

I have employed a similar strategy. However, for several of the ERI items, no suitable substitute could be found, so some of the items had to be excluded. This pertained to a few single items in the efforts and rewards scale. Information on the concept of overcommitment was dropped from the analysis. The scores were not originally standardized between items. In some instances, items had to be reversed. Items were then standardized to score 1-7, with higher numbers indicating higher efforts or rewards. This meant that dichotomous items from the survey (originally scoring 1-2) were given values 1 or 7. Items were weighted equally and summated. The two final scales were then brought into the same range of 1-25 to facilitate simple calculation of the ratio.

In table 4 below, I list items from the original ERI questionnaire alongside the items that were selected from the EWCS.

*Table 4: ERI items*

<i>ERI item#</i>	<i>ERI questionnaire</i>	<i>EWCS items</i>
<b>Efforts scale</b>		
1	I have constant time pressure due to a heavy work load.	a) Does your job involve working at very high speed? b) Does your job involve working to tight deadlines? (A combination of the two measures was used.)
2	I have many interruptions and disturbances while performing my job.	How often do you have to interrupt a task you are doing in order to take on an unforeseen task?
3	I have a lot of responsibility in my job.	(No suitable items were found.)
4	I am often pressured to work overtime.	Last 12 months how often have you worked in your free time in order to meet work demands?
5	My job is physically demanding.	(Excluded due to use in DCSM.)
6	Over the past few years, my job has become more and more demanding.	a) Last 3 years changes occurred at your current workplace: New processes or technologies were introduced? b) Last 3 years changes occurred at your current workplace: Substantial restructuring or reorganisation was carried out? (A combination of the two measures was used.)
<b>Rewards scale</b>		
<i>Esteem subscale</i>		
7	I receive the respect I deserve from my superior or a respective relevant person.	In general, your immediate manager / supervisor - Respects you as a person.
8	I experience adequate support in difficult situations.	Your colleagues help and support you
9	I am treated unfairly at work.	(No suitable items were found.)
14	Considering all my efforts and achievements, I receive the respect and prestige I deserve at work.	(No suitable items were found.)
<i>Promotion subscale</i>		
10	My job promotion prospects are poor.	Agree or disagree about your job - My job offers good prospects for career advancement?
13	My current occupational position adequately reflects my education and training.	My present skills correspond well with my duties.
15	Considering all my efforts and achievements, my job promotion prospects are adequate.	(No suitable items were found.)
16	Considering all my efforts and achievements, my salary / income is adequate.	Agree or disagree about your job - I am well paid for the work I do?
<i>Security subscale</i>		
11	I have experienced or I expect to experience an undesirable change in my work situation. Reverse coding	Agree or disagree about your job - I might lose my job in the next 6 months?
12	My employment security is poor.	(No suitable items were found.)

A principal components analysis showed that both the efforts and rewards scales were onedimensional constructs. However, both scales were less than satisfactory in terms of internal consistency. The four items of the efforts scale scored an alpha of 0.442, whereas the six items of the rewards scale scored 0.372. The implications, based on Ringdal (2007:330-331) are that correlations between items might be too low, and/or that the number of items is too small. In this case, the interpretation of EWCS items as ERI items might not properly reflect the intended constructs, and the number of items that had to be excluded from the analysis have driven internal consistency further downwards.

Another grave concern is that due to the complexity of the construct, containing no less than 13 items as conceived of here, a large number of items were originally deleted due to listwise deletion in SPSS. The workaround was to use mean values for *all* missing values.

The net result of this is that in terms of validity, reliability and generalization, the EWCS does not appear to be an entirely trustworthy data source for measuring ERI. However, I will run an experimental analysis using the ERI proxy to see whether anything interesting can be learned from the results.

In line with the expectation that ratios larger than 1 are seen as unhealthy, the item was dummy coded, with values  $>1$  indicating effort-reward-imbalance. Distribution of the original effort-reward ratio is shown below in figure 10.

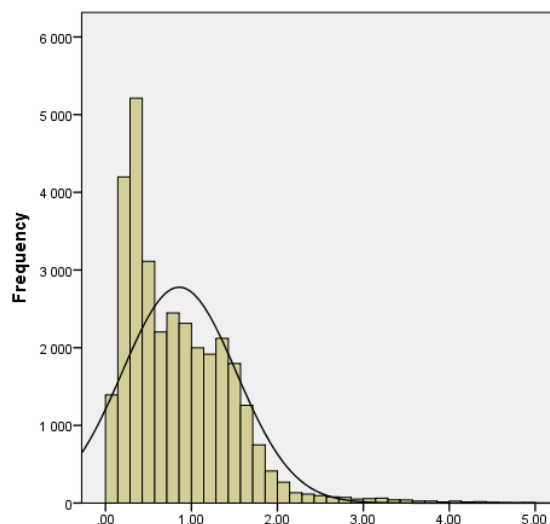


Fig. 10: Original effort-reward ratio

### 3.5.3. Operationalization of organizational justice

The standard operationalization of organizational justice is based on Niehoff & Moorman's (1993) 23 item questionnaire. This questionnaire contains items such as "My

work schedule is fair” and “Job decisions are made by managers in an unbiased manner.” Special emphasis is placed on the manager’s role, which is covered in 13 of the items. As pointed out in the theory section, the EWCS does not contain a lot of information on these issues. Also, I’m applying a more institutional approach to the concept of justice.

Two dichotomous items were selected: “Is there an employee acting as an employee representative?” and “Does management hold meetings in which you can express your views?”. These items were combined into three dummy items. Respondents answering no to both questions were coded as Low, respondents answering yes to one of the items were coded as Medium, and those answering yes to both were coded as High Organizational Justice, the latter being the reference category.

#### 3.5.4. Operationalization of emotional labour

The EWCS contains a few items on the issue of emotional involvement in the workplace, such as “handling angry clients, patients”, “emotionally involved in your work” and “requires that you hide your feelings”. The three items loaded on a single factor, but reliability analysis showed an alpha of only 0.384. Based on the importance of emotional dissonance, the single item on hiding feelings was thus selected to measure the impact of emotional labour. Respondents indicating that they were required to hide their feelings most of or all the time were coded into one group.

#### 3.5.5. Operationalization of the physical environment

The EWCS is a rich source of information on the physical work environment. However, my ambition was to create a single index for the physical environment. Three initial measures were created. All single items were scaled 1-7 ranging from all of the time to no of the time. First, four items on vibrations, noise, and temperatures were combined to create physical index 1, using mean values of at least two items for missing values. All factors loaded on a single component with an alpha of 0.779. Second, five items on fumes, chemicals, tobacco and infectants were combined to create physical index 2, using mean values of at least three items for missing values. All factors loaded on a single component with an alpha of 0.713. Five items on painful positions, lifting, standing and repetitive work were combined into physical index 3, using mean values of at least 4 items for missing values. All factors loaded on a single component with an alpha of 0.683. A second order factor analysis showed that all three indexes loaded on a single component, with an alpha of 0.649. Although falling slightly short of the 0.7 criterion, the physical work environment is theoretically well grounded as a

singular entity. The three measures were combined into an physical environment index, scoring 0-6.

### 3.5.6. Operationalization of social class

There are several ways of measuring class based on socioeconomic position. This is a subject matter for a thesis of its own, for details see Leiulfsrud et al (2002). I have decided to use *occupational class* as found in the ISCO-88 system, “International Standard Classification of Occupations of 1988” (ILO 2004a), as the main interest here lies in the effects of the jobs themselves. ISCO-88 “*groups jobs together in occupations and more aggregate groups mainly on the basis of the similarity of skills required to fulfil the tasks and duties of the jobs*” (ibid.). ISCO-88 groups jobs together into ten major groups. The groups are as follows:

- ISCO1 - Legislators, senior officials and managers
- ISCO2 - Professionals
- ISCO3 - Technicians and associate professionals
- ISCO4 - Clerks
- ISCO5 - Service workers and shop and market sales workers
- ISCO6 - Skilled agricultural and fishery workers
- ISCO7 - Craft and related trades workers
- ISCO8 - Plant and machine operators and assemblers
- ISCO9 - Elementary occupations
- ISCO0 - Armed forces

The EWCS contains ISCO-88 (“International Standard Classification of Occupations of 1988”) classifications of job characteristics. ISCO-88 “*groups jobs together in occupations and more aggregate groups mainly on the basis of the similarity of skills required to fulfil the tasks and duties of the jobs*” (ILO 2004a).

All groups are included in the analysis, with the exception of armed forces. This group consists of people who are serving in the armed forces at the time of the survey, including auxiliary services, whether on a voluntary or compulsory basis, and who are not free to accept civilian employment (ILO 2004b). While the question of the influence military work has on wellbeing is theoretically interesting, the group is excluded for two reasons: First, it represents a very small part of the whole sample (N=196). Second, due to the possibly compulsory nature of military service, it is not directly comparable to being an employee. In addition, this group is not categorized on the basis of skill level, as are the other groups.

### 3.5.7. Operationalization of welfare and working conditions regimes.

The countries have been placed within two typologies, and I will perform separate analyses for each typology. For the welfare regimes, I based the grouping on Bambra (2007) and Eikemo & Bambra (2008). Scandinavian welfare regimes were chosen as the reference category. The placement in the typologies is shown below in table 5.

*Table 5: Placement in the welfare state typology and the WSI.*

<b>Nation</b>	<b>Welfare</b>	<b>WSI</b>
<i>Albania</i>	Eastern	MTBD
<i>Austria</i>	Bismarckian	Pragmatists
<i>Belgium</i>	Bismarckian	Pacesetter
<i>Bulgaria</i>	Eastern	MTBD
<i>Croatia</i>	Eastern	Conventional
<i>Cyprus</i>	Southern	Other
<i>Czech Republic</i>	Eastern	Pragmatists
<i>Denmark</i>	Scandinavian	Pacesetter
<i>Estonia</i>	Eastern	Pragmatists
<i>Finland</i>	Scandinavian	Pacesetter
<i>France</i>	Bismarckian	Pacesetter
<i>FYROM Macedonia</i>	Eastern	Other
<i>Germany</i>	Bismarckian	Pacesetter
<i>Greece</i>	Southern	Pragmatists
<i>Hungary</i>	Eastern	Pragmatists
<i>Ireland</i>	Anglo-Saxon	Pragmatists
<i>Italy</i>	Southern	Pacesetter
<i>Kosovo</i>	Eastern	Other
<i>Latvia</i>	Eastern	Pragmatists
<i>Lithuania</i>	Eastern	Pragmatists
<i>Luxembourg</i>	Bismarckian	Pacesetter
<i>Malta</i>	Southern	Other
<i>Montenegro</i>	Eastern	Other
<i>Netherland</i>	Bismarckian	Pacesetter
<i>Norway</i>	Scandinavian	Pacesetter
<i>Poland</i>	Eastern	Pragmatists
<i>Portugal</i>	Southern	Pacesetter
<i>Romania</i>	Eastern	MTBD
<i>Slovakia</i>	Eastern	Pragmatists
<i>Slovenia</i>	Eastern	Pacesetter
<i>Spain</i>	Southern	Pacesetter
<i>Sweden</i>	Scandinavian	Pacesetter
<i>Turkey</i>	Southern	MTBD
<i>UK</i>	Anglo-Saxon	Pragmatists

For the Work Security Index, most of the countries in the EWCS were included in the index. For the countries not included in the index, reliable information was not available at the time of writing to place them within the typology. Thus, they were placed in a group of “Others”. Taken at face value, this group of countries seems to have little in common. Cyprus and Malta have been westerly oriented democracies, whereas Macedonia, Kosovo, and Montenegro carry a legacy of being former East Block countries with strong political upheavals in the 90s. Pacesetters were set as the reference category.

### 3.6. Control variables

Ideally, we would have data on the health of individuals before they started in their jobs. However, such data is not available in a cross-sectional study like this one. The EWCS contains a series of questions on the existence of health problems occurring within the last 12 months. I have divided these questions into two broad categories on somatic and mental health (for details, see the methods chapter). These measures must be viewed with caution. We do not know the causes of the reported health problems. They might be caused by work-related issues, or they might be not. For example, it might be that excessive job demands or effort-reward imbalance actually caused the reported health issues. However, it might also be that pre-existing health conditions have increased the subjective experience of job demands.

*Baseline health* was controlled for by creating two health indices, one for somatic and one for mental health. Respondents were asked yes/no questions on experiencing health problems in different areas. The *somatic health* issues were hearing problems, skin problems, back pains, two types of muscle pain, headaches, stomach pains, breathing problems, cardiovascular disease and injuries. The items were dummy coded and summated to form an index of ten items, ranging on a scale of 0-10. Missing items were handled by assigning mean values to all items that had at least six responses, and rounding off summated scores to the nearest integer.

Similarly, *baseline mental health* was controlled by creating an index of four items on worries, tiredness, sleeping disorder and “other” issues, using mean values of at least two items.

Distributions for both indices are shown below in figures 11 and 12.

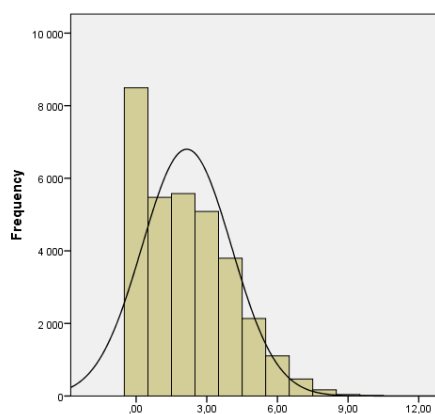


Fig. 11: Somatic health index distribution.

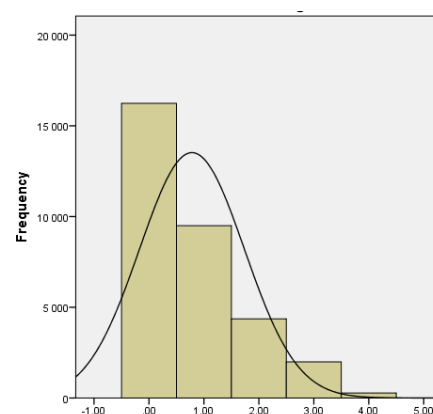
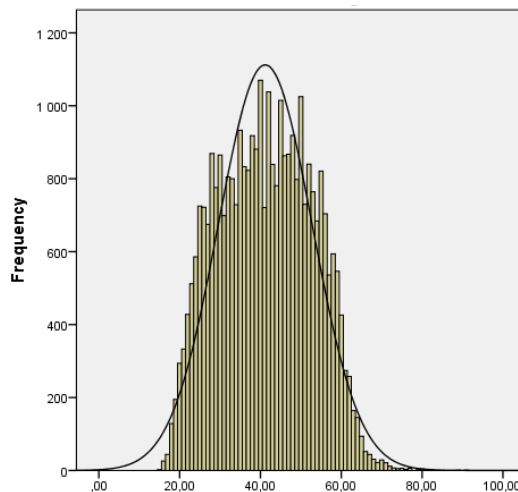


Fig 12: Mental health index distribution.

Gender was split into two categories. Men were given the value 0, while *women* were given the code 1. All coefficients in the models thus show the predicted effects of being a woman, compared to being a man.

*Age* (Mean 41.2, SD 11.6) was used as is, meaning that no respondent was excluded on the basis of age. The EWCS features an age range of 15 to 91. As we can see from the distribution in figure 13 below, employment under the age of 18 and above around 67 is extremely rare. However, as education and pension systems vary throughout Europe, there were no theoretical grounds per se to exclude any age group.



*Figure 13: Age distribution.*

I have conceptualized *working time* along two dimensions, namely the number of hours worked, and the degree of shift work.

First, I have divided working hours into the categories of *part time*, *full time* and *overtime work*, using full time as a reference category. Part time was defined as 1-29 hours/week, full time 30-48 h/w and overtime as 49-168 h/w, based on the suggestions of van Bastelaer et al (1997).

Second, I have tried to identify the prevalence of unusual working hours, combining evening, night and weekend work into a single indicator for *high shift work*. The effect of shift work was measured by creating a dummy variable. People working either at least ten nights per month or ten evenings per month or 3 or more Sundays a month were coded as having high shift work. The cut off points were set somewhat arbitrarily, but the values for night and evening work roughly reflect half the number of working days in a regular month. The value for Sunday work was based on the Norwegian maximum limit of working every other weekend or approximately two weekends a month. Missing items were coded zero, which assumes they those who did not answer, do not work beyond these limits.



### 3.7. Scoring the items

Different strategies are available for scoring and transforming the items, each with their own strengths and weaknesses (Ringdal n.d.:38-39). The default strategy is to use the original items as they are originally coded. In a regression model, the constant (intercept) value is the predicted value of the dependent variable (in this case wellbeing) when all explanatory variables are set to zero. One unit change in the explanatory variable yields one unit change in the dependent variable. For example, changing values from being a man to being a woman is expected to decrease wellbeing. In the case of years, one year's increase in age might increase or decrease wellbeing by the size of the regression coefficient. The advantage to this approach is that changes in regression coefficients might be interpreted in a intuitively meaningful way. The disadvantage is that it is hard to compare the effects between coefficients. In some cases, such as age, setting the regression coefficient to zero might not be meaningful.

One alternative strategy is to standardize all variables to obtain common metrics (Ringdal n.d.:38-39). The drawback to this strategy is that regression coefficients cannot be interpreted intuitively.

Another alternative is to use some form of centring of variables (Ringdal n.d.:38-39). Centring means to measure a variable in deviations from the mean. If all variables were grand mean centred, the regression constant will be the predicted value for a person scoring average value, in this case it could for example be a man of around 40 working full time, with medium demands, control and support at work.

In the end, I have decided to stick with the original scoring of the items. The reason for this is to simplify interpretation of the coefficients. To highlight the overall effects of variables, I will perform predictions for the extreme and mean values of the coefficients, as well as graph some of them out.

### 3.8. Validity, reliability and generalization

I have discussed issues of **validity** on several of the items in the sections on operationalization. I will try to summarize the points so far. Validity by definition goes towards whether we *actually* measure what we're *trying* to measure, and this sense is often referred to as *construct validity* (Ringdal 2007:90). In terms of wellbeing, I will discuss this in relation to several different types of construct validity. The *face validity* of wellbeing appears sound: the concept of wellbeing rests heavily on questions on emotional states. The *content validity* refers to whether the selected indicators cover the most important aspects of

wellbeing, or whether there is a full compliance between the theoretical construct and the empirical operationalization. Ringdal (2007:87) argues that this boils down to a subjective assessment by the researcher. As the wellbeing is a measure that has been developed and validated by the WHO, and is widely available, a subjective assessment would be that it is the best measure available. Finally, there is the issue of *nomological validity* (Ringdal 2007:88), which indicates whether a measure behaves in practice as expected from theory. This has to be reviewed based on the results of the analysis.

In terms of the explanatory variables, many of the same arguments are very similar to wellbeing, as they are theoretical constructs, in particular the psychosocial items: The DCSM, ERI, organizational justice and emotional labour all come to mind. The class operationalization is perhaps the most objective, whereas the national level typologies are theoretical constructs. It is my view, however, that the validity of the majority of the variables are well theoretically founded and operationalized.

**Reliability** is defined as the overall consistency of a measure (Ringdal 2007:90), and is said to be high if it produces similar results under consistent conditions. In terms of wellbeing, Krueger & Schade (2008) argue that while reliability of subjective wellbeing measures is lower than for measures of education and income, for example, it is sufficiently high to support current research, particularly when group means are compared.

As the EWCS is a cross sectional study, there are no means to check *test-retest reliability* (Ringdal 2007:87). In terms of *internal consistency*, defined as the degree of correlation between items (ibid.), the wellbeing measure is satisfactory. For the explanatory variables, ERI provided rather poor results, while the physical environment index was slightly unsatisfactory.

Another issue regarding reliability is the use of mean imputation. As I have pointed out, this technique has the drawback of reducing variance. Mean imputation thus is expected to understate the true effects of the explanatory variables, as well as the true variation on wellbeing.

**Statistical generalization** is defined as drawing conclusions on the populations on the basis of the data sample (Ringdal 2007:238). I have used the common criterion of a 5 percent significance level ( $p \leq 0.05$ ), defined as the likelihood of observing a value of the test observator which is at least as high as in the sample, given that the null hypothesis is true (Ringdal 2007:240-241).

### 3.9. Multilevel analysis

I will now do a somewhat brief review of theory on *multilevel analysis* (Ringdal n.d., Strabac 2007), as well as discuss implications for the current study. Multilevel analysis is done here in a linear design, based on many of the same assumptions as ordinary least squares regression (Ringdal n.d.). I will first give a theoretical background for multilevel analysis, before presenting some important technical terms. I will then present the analytical strategy and the statistical tests performed.

#### 3.9.1. Theoretical background of multilevel analysis

Multilevel analysis is a technique where variance in the dependent variable is seen to be caused at different levels. As I have pointed out before in the sections on psychosocial theories, some of the variance in wellbeing can be accounted for at the individual level. In multilevel analysis, this is usually considered to be level *one* of the analysis (Ringdal n.d.:18-20). Some of the variance can be expected to occur at the national level, for example due to different rules and regulations as suggested in the chapter on working conditions regimes. In this context, there are only two levels, so countries will be at level *two*. Ideally, data would be available on the organizations where people work, as some of the variance could be expected to occur between employers. However, the EWCS does not include data at this intermediary level. Theoretically, social class could be seen as a separate level, but according to Ringdal (n.d.:18) this would be a fallacy, as class does not constitute a random sample from the population. (Countries are often used as level 2 units, although this may be seen as a violation of the random sample assumption. This is not acceptable when it comes to class, according to Ringdal.) I will therefore proceed doing a two level analysis.

#### 3.9.2. Technical description of the multilevel model

I will give a brief technical description of the multilevel model, based on Ringdal (n.d.).

The basic OLS regression equation which multilevel models are based on can be expressed as  $Y_i = b_0 + b_1X_i + e_i$  (Ringdal 2007:366). To illustrate this in the context of this study:  $Y$  is the predicted wellbeing for employee  $i$ ,  $b_0$  is the regression constant, meaning the predicted value of wellbeing when all explanatory variables are set at zero.  $b_1X_i$  is the explanatory variable, such as for example age. Additional explanatory variables can be added to the equation in the form  $b_nX_i$ .  $e_i$  is the residual term.

The equation for the multilevel model is an extended version of the basic OLS regression, and with one explanatory variable can be expressed as  $Y_i = \beta_0 + \beta_1X_{ij} + u_{0j} + e_{ij}$  (Ringdal n.d.:29).  $Y_{ij}$  is the predicted wellbeing of employee  $i$  in country  $j$ .  $b_{0j}$  is the regression constant

for country  $j$ .  $b_1 * X_{1ij}$  is the fixed explanatory variable.  $u_{0j}$  is the residual term for level 2, while  $e_{ij}$  is the residual term for level 1. Additional explanatory variables can be added at each level.

In terms of predictions, the regression equation is calculated in exactly the same way as the OLS version.

To clarify the terminology on multilevel models, I will review some important terms. I will be using what is referred to as a *variance component*, or perhaps more commonly, *random intercept model* (Ringdal n.d.:26). The random intercept model gives parallel lines for the linear regression lines for each level. As Ringdal notes, this may be an unrealistic assumption in some cases. The *random slopes model* allows regression coefficients to vary between countries, so that the effect of stress on wellbeing is allowed to differ between countries. I argue on this in 3.9.3.3.

There are two major requirements for doing a multilevel analysis, according to Strabac (2007:175-176). One: The dependent variable must be continuous and close to normally distributed. The wellbeing scale ranges from 0-25, and is relatively normally distributed, with some skew towards the right (mean=15.46), and a spike at value 19 on the scale, as seen in figure 4. Two: If there are between 10-100 units of analysis, multilevel analysis can usually be used, although there are a few limitations. At level one, there is no problem as  $N=32.366$ . The number of countries is 34. According to Ringdal (n.d.:37), level 2 variances will be satisfactorily estimated at 30 groups. The current study thus should satisfy the major requirements.

Epidemiological studies tend to favour logistic designs due to interest in the dichotomy of being either healthy or ill. The present study has a slightly different perspective, in that wellbeing can be seen as a continuous phenomenon, and wellbeing is not a measure of illness per se. The research question is not epidemiological in the sense of identifying risks or causes of disease; rather, the question posed is what the connection is between working conditions and wellbeing. Thus, it makes sense to use a linear design.

### 3.9.3. Analytical strategy

I used the analytical strategy proposed by Ringdal (n.d), which is as follows.

#### 3.9.3.1. Step 1: The null model

*The null model* is the starting point for multilevel analysis (Ringdal n.d.:26), and in this case simply means the average wellbeing score for all respondents, here 15.46 on a 0-25 scale. In multilevel analysis, two residual terms are introduced. *Residual one* is the unexplained variance at the individual level, and *residual two* is the unexplained variance at the country level. These two figures are interesting in that they can be used to compute the

*intra class correlation*, which indicates how much of the variation in wellbeing stems from level 2 units, in our case countries (Ringdal n.d.:39). The equation for computing the ICC is as follows (Ringdal n.d.:27):

$$\rho = \frac{\sigma_u^2}{\sigma_u^2 + \sigma_e^2}$$

Or:

$$\frac{\text{(unexplained variance at level 1)}}{\text{(unexplained variance at level 1) + (unexplained variance at level 2)}}$$

### 3.9.3.2. Step 2: Developing the level 1 model

Ringdal (n.d.) suggests developing a full level 1 model. This involves adding all individual level variables in groups, and eliminating insignificant variables. This also involves testing for interactions and nonlinearity for the level 1 variables.

Starting with the psychosocial and physical environment variables: Based on theory, the psychosocial variables were entered along with control variables for age, gender and baseline health. Age, health indices, DCSM and physical environment indices were tested for nonlinearity. The results are shown in model 1, table 9 in chapter 4.

The variables for emotional labour yielded insignificant results, and were removed from the model. The square terms for mental health, job control and physical environment were likewise removed. Square terms for age, somatic health, job demands and social support, were retained. Results are shown in model 2, table 9, chapter 4.

Testing of class was done in two separate steps. First, the psychosocial terms were removed from the model and replaced with class, as well as the physical environment index. Control variables (age, gender, working hours, health indices) were retained. The results are shown in model 3, table 9, chapter 4.

Psychosocial and class model: The psychosocial variables from model 2 were then added together with social class in a single model. The results are shown in model 4, table 10, chapter 4.

### 3.9.3.3. Step 3: Developing the random model

Do coefficients in the individual level equations vary significantly among countries? Ringdal (n.d.:40) suggests that this should be tested based primarily on theory. The main theories in the psychosocial domain are the demand-control-support model and the effort-reward-imbalance model. Additionally, the theory on organizational justice has yielded some significant results. The other predominant perspective so far is social class. Is there reason to

believe that the effects of demand, support and control vary between countries? Seeing as the DCSM is a rather universal theory, there is no particular reason to suspect this. Rather, we can expect that certain types of jobs and job characteristics are more prevalent in some countries. For example, the Scandinavian countries are included in both the social democratic category of welfare states, as well as the Pacesetter category of the Work Security Index. The differences in effects of labour markets are structural rather than individual.

Likewise, as far as ERI is concerned, there is reason to believe that there are structural differences among the countries in the ratio between efforts and rewards. There is less reason to think that the effect of imbalance *itself* varies between countries. The same goes for the issue of justice.

The net result is that all coefficients were set as fixed, and the random intercept model was maintained. According to Ringdal (n.d.:41), you should only include cross-level interactions for variables that are not set as fixed. Thus, no cross-level interactions were carried out in the next models.

#### 3.9.3.4. Step 4: Adding level 2 explanatory variables

Based on theory, we have two alternative models to explain differences in wellbeing at the national level. First there is the welfare state typology, and second is the working conditions regimes. These two typologies categorize the same countries, and it therefore makes no sense to include them both at once in the models. Two separate analyses were thus carried out, model 5 testing the welfare state typology, and model 6 testing the working conditions regimes. These are both found in table 10, chapter 4.

#### 3.9.3.5. Statistical tests of the models: Pseudo R squares

The residuals computed in the null model are expected to grow smaller due to the added explanatory variables added at each level (Ringdal n.d.:30). Ringdal argues that the differences between residuals for the null model and the current models may be used to compute pseudo R squares. True R squares measure how much of the variance in the dependent variable (wellbeing) are caused by the explanatory variables. Ringdal suggests computing three pseudo R squares, one for each level and one for the two levels combined.

The formula for level one is:

$$R_1^2 = \frac{\sigma_{e(null)}^2 - \sigma_{e(current)}^2}{\sigma_{e(null)}^2}$$

The formula for level two is:

$$R_2^2 = \frac{\sigma_{u(null)}^2 - \sigma_{u(current)}^2}{\sigma_{u(null)}^2}$$

Laid out, both formulas read as follows, the only difference is the level of variance :

$$\frac{\text{Residual variance for the null model} - \text{Residual variance for the current model}}{\text{Residual variance for the null model}}$$

The formula for the total pseudo R square is

$$R_T^2 = \frac{(\sigma_{e(null)}^2 - \sigma_{e(current)}^2) + (\sigma_{e(null)}^2 - \sigma_{e(current)}^2)}{\sigma_{e(null)}^2 + \sigma_{u(null)}^2}$$

### 3.9.3.6. Compositional and contextual effects.

When inter-group (or inter-context) differences in wellbeing are attributable to differences in group composition (that is, in the characteristics of the individuals of which the groups are comprised) they are said to result from *compositional effects*. This is analogous to differences at level 1. On the other hand, when group differences are attributable to the effects of group level variables or properties, they are said to result from *contextual effects* (Diez 2002). This is analogous to differences at level 2.

## 4. Results

### 4.1. Average wellbeing among employees in Europe.

The multilevel analysis will not be testing differences between individual countries. An overview of the differences between individual countries is given below. Rather than a descriptive table, I have performed a simple OLS regression, using only country values as explanatory variables. Norway was set as the reference category. The intention is to see whether the differences between countries are significant. Results are listed in table 6 below, ordered from high to low. I have also marked the countries according to classification in welfare and working conditions regimes.

Some comments on the national differences in wellbeing: As expected, Norway scores well on employee wellbeing. The only countries that score significantly better are Kosovo and Ireland. The situation in Kosovo is contrary to expectation. Kosovo is a young nation, declaring independence in 2008, and only partially recognized as a sovereign state. In addition, there is a relatively recent history of civil war (CIA 2013). Kosovo might therefore serve as a case in point on Lindeboom and van Doorslaer's (2004) finding that it may be problematic to compare subjective measures between cultural groups. Or it could be that due to economic uncertainty, having a job at all is extremely positive for subjective wellbeing.

Ireland, on the other hand, was found by The Economist (2005) to have the best quality of life in the world, due to its combination of economic progress and social stability. Thus, the results for Ireland are as expected, even though the country was also very much affected by the crisis of 2008. Relating to justice theory, subjective wellbeing among employees may depend much on what the reference group is.

There are no significant differences in employee wellbeing in Denmark, Spain, Sweden and Malta compared to Norway. Beyond this, all differences are negative and significant. The general pattern is that wellbeing is substantially worse in Eastern Europe, although countries such as Portugal and Italy also perform rather poorly. One should not discount the notion that economic and political conditions have a substantial effect on wellbeing. For example, as noted, Latvia was one of the countries most severely hit by the crisis of 2008. I will return to differences between countries in the discussion on welfare state versus the working conditions regimes.



Table 6: Average wellbeing among employees in Europe.

<b>Wellbeing</b>	<b>Coef.</b>	<b>SE</b>	<b>t</b>	<b>P&gt;t</b>	<b>[95% CI]</b>	<b>WF</b>	<b>WCR</b>
Constant (Norway)	<b>16.92</b>	0.16	109.08	<i>0.00</i>	16.62 17.22	Scand.	Pace
Kosovo	<b>0.87</b>	0.26	3.31	<i>0.00</i>	0.35 1.38	East	Oth.
Ireland	<b>0.63</b>	0.23	2.71	<i>0.01</i>	0.17 1.08	Ang-Sax	Prag.
Denmark	<b>0.21</b>	0.22	0.95	<i>0.34</i>	-0.22 0.65	Scand.	Pace
Spain	<b>0.15</b>	0.23	0.64	<i>0.52</i>	-0.30 0.60	South	Pace
Sweden	<b>-0.26</b>	0.23	-1.12	<i>0.26</i>	-0.71 0.19	Scand.	Pace
Malta	<b>-0.33</b>	0.23	-1.45	<i>0.15</i>	-0.78 0.12	South	Oth.
Netherlands	<b>-0.49</b>	0.23	-2.12	<i>0.03</i>	-0.95 -0.04	Bism.	Pace
Finland	<b>-0.80</b>	0.23	-3.52	<i>0.00</i>	-1.24 -0.35	Scand.	Pace
Luxembourg	<b>-0.81</b>	0.23	-3.45	<i>0.00</i>	-1.27 -0.35	Bism.	Pace
Belgium	<b>-0.86</b>	0.18	-4.83	<i>0.00</i>	-1.21 -0.51	Bism.	Pace
Germany	<b>-0.89</b>	0.19	-4.60	<i>0.00</i>	-1.27 -0.51	Bism.	Pace
United Kingdom	<b>-1.11</b>	0.21	-5.40	<i>0.00</i>	-1.52 -0.71	Ang-Sax	Prag.
Macedonia	<b>-1.15</b>	0.24	-4.77	<i>0.00</i>	-1.62 -0.68	East	Oth.
Cyprus	<b>-1.29</b>	0.23	-5.52	<i>0.00</i>	-1.75 -0.84	South	Oth.
Greece	<b>-1.37</b>	0.25	-5.56	<i>0.00</i>	-1.86 -0.89	South	Prag.
Montenegro	<b>-1.41</b>	0.24	-5.92	<i>0.00</i>	-1.87 -0.94	East	Oth
France	<b>-1.43</b>	0.18	-7.80	<i>0.00</i>	-1.79 -1.07	Bism.	Pace
Romania	<b>-1.45</b>	0.24	-6.09	<i>0.00</i>	-1.92 -0.98	East	MTBD
Austria	<b>-1.48</b>	0.23	-6.30	<i>0.00</i>	-1.94 -1.02	Bism.	Prag.
Poland	<b>-1.80</b>	0.22	-8.27	<i>0.00</i>	-2.23 -1.38	East	Prag.
Estonia	<b>-2.04</b>	0.23	-8.98	<i>0.00</i>	-2.48 -1.59	East	Prag.
Slovenia	<b>-2.23</b>	0.21	-10.55	<i>0.00</i>	-2.65 -1.82	East	Pace
Italy	<b>-2.25</b>	0.22	-10.44	<i>0.00</i>	-2.68 -1.83	South	Pace
Portugal	<b>-2.29</b>	0.24	-9.70	<i>0.00</i>	-2.75 -1.83	South	Pace
Bulgaria	<b>-2.41</b>	0.23	-10.48	<i>0.00</i>	-2.86 -1.96	East	MTBD
Slovakia	<b>-2.41</b>	0.23	-10.40	<i>0.00</i>	-2.87 -1.96	East	Prag.
Albania	<b>-2.66</b>	0.28	-9.47	<i>0.00</i>	-3.21 -2.11	East	MTBD
Croatia	<b>-2.86</b>	0.23	-12.65	<i>0.00</i>	-3.30 -2.41	East	Conv
Hungary	<b>-2.89</b>	0.23	-12.64	<i>0.00</i>	-3.34 -2.44	East	Prag.
Turkey	<b>-2.93</b>	0.21	-14.25	<i>0.00</i>	-3.33 -2.53	South	MTBD
Latvia	<b>-3.26</b>	0.22	-14.60	<i>0.00</i>	-3.70 -2.83	East	Prag.
Czech Republic	<b>-3.46</b>	0.24	-14.57	<i>0.00</i>	-3.92 -2.99	East	Prag.
Lithuania	<b>-3.93</b>	0.23	-16.99	<i>0.00</i>	-4.38 -3.47	East	Prag.

## 4.2. Results from the multilevel analysis

6 models were tested, in addition to running the null model. Model 1 introduces all the psychosocial and individual level variables, as well as testing for curvilinear effects. Model 2 removes single variables which were found to be insignificant in model 1. Model 3 takes out the psychosocial variables and introduces social class. Model 4 then combines the psychosocial and the class variables. Finally, models 5 and 6 retain the psychosocial and class variables and introduce the welfare state typology and the Work Security Index, respectively.

Variance components and pseudo R squares are given in table 7 and 8 below.

Results from the multilevel analyses are shown in table 9 and 10 below. Only regression coefficients, standard errors (SE) and results from significance tests are shown. For a full review of the models, see appendix 8.3.

For a nontechnical guide to interpreting the results from the model, please see the appendix, section 8.3.

*Table 7: Variance components*

Variance/Model	0	1	2	3	4	5	6
Individual level	22.9079	18.0733	18.0799	19.2057	18.0629	18.0630	18.0629
Between-country	1.3733	0.8028	0.8012	0.9254	0.8101	0.4621	0.3591
Explained individual level	0.00	0.2111	0.2107	0.1616	0.2115	0.2115	0.2115
Explained country level	0.00	0.00	0.00	0.00	0.00	0.6635	0.7385
Log Likelihood	-96 669	-92 828	-92 835	-93 814	-92 820	-92 810	-92 806

*Table 8: Pseudo R squares*

Model	$\sigma_{e(null)}^2$	$\sigma_{e(current)}^2$	$R_1^2$	$\sigma_{u(null)}^2$	$\sigma_{u(current)}^2$	$R_2^2$	$R_T^2$
1	22.91	18.07	0.2110	-	-	-	-
2	22.91	18.08	0.2108	-	-	-	-
3	22.91	19.21	0.1616	-	-	-	-
4	22.91	18.06	0.2115	-	-	-	-
5	22.91	18.06	0.2115	1.37	0.46	0.6635	0.2371
6	22.91	18.06	0.2115	1.37	0.36	0.7385	0.2413

### 4.1. The null model

Intra class correlation: The ICC is 5.7%, which is above the 5% threshold and justifies a multilevel approach (Ringdal n.d.:39).

Table 9: Multilevel analysis models 1-3.

Wellbeing model	1			2			3		
	Coef.	SE	P>z	Coef.	SE	P>z	Coef.	SE	P>z
(Constant)	<b>17.919</b>	0.40	0.00	<b>17.911</b>	0.38	0.00	<b>19.679</b>	0.34	0.00
Somatic Health (0-10)	<b>-0.559</b>	0.04	0.00	<b>-0.566</b>	0.03	0.00	<b>-0.638</b>	0.04	0.00
Somatic <sup>2</sup> (0-10)	<b>0.026</b>	0.01	0.00	<b>0.027</b>	0.01	0.00	<b>0.030</b>	0.01	0.00
Mental Health (0-4)	<b>-1.259</b>	0.07	0.00	<b>-1.206</b>	0.03	0.00	<b>-1.338</b>	0.03	0.00
Mental <sup>2</sup> (0-4)	<b>0.020</b>	0.02	0.41	-	-	-	-	-	-
Women	<b>-0.222</b>	0.05	0.00	<b>-0.214</b>	0.05	0.00	<b>-0.282</b>	0.05	0.00
Age	<b>-0.132</b>	0.01	0.00	<b>-0.131</b>	0.01	0.00	<b>-0.117</b>	0.01	0.00
Age <sup>2</sup>	<b>0.001</b>	0.00	0.00	<b>0.001</b>	0.00	0.00	<b>0.001</b>	0.00	0.00
Part Time <sup>a</sup>	<b>-0.064</b>	0.07	0.38	<b>-0.064</b>	0.07	0.39	<b>-0.023</b>	0.08	0.76
Over Time <sup>a</sup>	<b>-0.298</b>	0.08	0.00	<b>-0.298</b>	0.08	0.00	<b>-0.348</b>	0.09	0.00
Shift Work High	<b>0.145</b>	0.06	0.02	<b>0.147</b>	0.06	0.02	<b>0.015</b>	0.06	0.82
Job Demands (0-25)	<b>-0.145</b>	0.02	0.00	<b>-0.145</b>	0.02	0.00	-	-	-
Demands <sup>2</sup> (0-25)	<b>0.004</b>	0.00	0.00	<b>0.004</b>	0.00	0.00	-	-	-
Job Control (0-25)	<b>0.114</b>	0.03	0.00	<b>0.107</b>	0.01	0.00	-	-	-
Control <sup>2</sup> (0-25)	<b>0.000</b>	0.00	0.75	-	-	-	-	-	-
Social Support (0-25)	<b>0.006</b>	0.02	0.79	<b>0.007</b>	0.02	0.73	-	-	-
Support <sup>2</sup> (0-25)	<b>0.005</b>	0.00	0.00	<b>0.005</b>	0.00	0.00	-	-	-
Discrimination Hi	<b>-0.326</b>	0.10	0.00	<b>-0.332</b>	0.10	0.00	-	-	-
Harassment Hi	<b>-0.056</b>	0.07	0.43	-	-	-	-	-	-
ERI	<b>-0.193</b>	0.06	0.00	<b>-0.191</b>	0.06	0.00	-	-	-
Justice Low <sup>b</sup>	<b>-0.253</b>	0.06	0.00	<b>-0.253</b>	0.06	0.00	-	-	-
Justice Med. <sup>b</sup>	<b>-0.047</b>	0.06	0.42	<b>-0.047</b>	0.06	0.42	-	-	-
Hide Feelings <sup>c</sup>	<b>0.031</b>	0.05	0.57	-	-	-	-	-	-
Feelings Other <sup>c</sup>	<b>-0.535</b>	0.17	0.00	-	-	-	-	-	-
Physical Env. (0-6)	<b>0.169</b>	0.07	0.01	<b>0.171</b>	0.03	0.00	-	-	-
Phys <sup>2</sup> (0-6)	<b>0.001</b>	0.02	0.94	-	-	-	-	-	-
Managers <sup>d</sup>	-	-	-	-	-	-	<b>0.866</b>	0.13	0.00
Professionals <sup>d</sup>	-	-	-	-	-	-	<b>0.911</b>	0.10	0.00
Technicians & ass. professionals <sup>d</sup>	-	-	-	-	-	-	<b>0.652</b>	0.10	0.00
Clerks <sup>d</sup>	-	-	-	-	-	-	<b>0.489</b>	0.10	0.00
Service workers <sup>d</sup>	-	-	-	-	-	-	<b>0.613</b>	0.10	0.00
Agricultural and fishery <sup>d</sup>	-	-	-	-	-	-	<b>0.260</b>	0.27	0.34
Craft and related trades <sup>d</sup>	-	-	-	-	-	-	<b>0.677</b>	0.11	0.00
Plant and machine operators and assemblers <sup>d</sup>	-	-	-	-	-	-	<b>0.249</b>	0.11	0.03
Bismarckian <sup>e</sup>	-	-	-	-	-	-	-	-	-
Anglo-Saxon <sup>d</sup>	-	-	-	-	-	-	-	-	-
Southern <sup>d</sup>	-	-	-	-	-	-	-	-	-
Eastern <sup>d</sup>	-	-	-	-	-	-	-	-	-
Pragmatists <sup>f</sup>	-	-	-	-	-	-	-	-	-
Conventionals <sup>f</sup>	-	-	-	-	-	-	-	-	-
Much Too Be Done <sup>f</sup>	-	-	-	-	-	-	-	-	-
Other <sup>f</sup>	-	-	-	-	-	-	-	-	-

Reference categories: a) Full Time Work b) Organizational Justice High c) Hiding Feelings Low d) Elementary Occupations e) Social Democratic Regimes f) Pacesetter Regimes

Table 10: Multilevel analysis models 4-6.

Wellbeing model	4			5			6		
	Coef.	SE	P>z	Coef.	SE	P>z	Coef.	SE	P>z
(Constant)	<b>17.705</b>	0.38	0.00	<b>18.738</b>	0.47	0.00	<b>18.309</b>	0.39	0.00
Somatic Health (0-10)	<b>-0.567</b>	0.03	0.00	<b>-0.568</b>	0.03	0.00	<b>-0.569</b>	0.03	0.00
Somatic <sup>2</sup> (0-10)	<b>0.027</b>	0.01	0.00	<b>0.027</b>	0.01	0.00	<b>0.027</b>	0.01	0.00
Mental Health (0-4)	<b>-1.202</b>	0.03	0.00	<b>-1.199</b>	0.03	0.00	<b>-1.203</b>	0.03	0.00
Mental <sup>2</sup> (0-4)	-	-	-	-	-	-	-	-	-
Women	<b>-0.188</b>	0.05	0.00	<b>-0.189</b>	0.05	0.00	<b>-0.188</b>	0.05	0.00
Age	<b>-0.130</b>	0.01	0.00	<b>-0.130</b>	0.01	0.00	<b>-0.130</b>	0.01	0.00
Age <sup>2</sup>	<b>0.001</b>	0.00	0.00	<b>0.001</b>	0.00	0.00	<b>0.001</b>	0.00	0.00
Part Time <sup>a</sup>	<b>-0.050</b>	0.07	0.50	<b>-0.055</b>	0.07	0.46	<b>-0.048</b>	0.07	0.52
Over Time <sup>a</sup>	<b>-0.300</b>	0.08	0.00	<b>-0.295</b>	0.08	0.00	<b>-0.295</b>	0.08	0.00
Shift Work High	<b>0.127</b>	0.06	0.04	<b>0.128</b>	0.06	0.04	<b>0.127</b>	0.06	0.04
Job Demands (0-25)	<b>-0.151</b>	0.02	0.00	<b>-0.152</b>	0.02	0.00	<b>-0.152</b>	0.02	0.00
Demands <sup>2</sup> (0-25)	<b>0.004</b>	0.00	0.00	<b>0.004</b>	0.00	0.00	<b>0.004</b>	0.00	0.00
Job Control (0-25)	<b>0.111</b>	0.01	0.00	<b>0.110</b>	0.01	0.00	<b>0.111</b>	0.01	0.00
Control <sup>2</sup> (0-25)	-	-	-	-	-	-	-	-	-
Social Support (0-25)	<b>0.006</b>	0.02	0.78	<b>0.005</b>	0.02	0.79	<b>0.006</b>	0.02	0.78
Support <sup>2</sup> (0-25)	<b>0.005</b>	0.00	0.00	<b>0.005</b>	0.00	0.00	<b>0.005</b>	0.00	0.00
Discrimination Hi	<b>-0.328</b>	0.10	0.00	<b>-0.329</b>	0.10	0.00	<b>-0.327</b>	0.10	0.00
Harassment Hi	-	-	-	-	-	-	-	-	-
ERI	<b>-0.179</b>	0.06	0.00	<b>-0.180</b>	0.06	0.00	<b>-0.180</b>	0.06	0.00
Justice Low <sup>b</sup>	<b>-0.271</b>	0.06	0.00	<b>-0.268</b>	0.06	0.00	<b>-0.273</b>	0.06	0.00
Justice Med. <sup>b</sup>	<b>-0.056</b>	0.06	0.34	<b>-0.054</b>	0.06	0.36	<b>-0.056</b>	0.06	0.33
Hide Feelings <sup>c</sup>	-	-	-	-	-	-	-	-	-
Feelings Other <sup>c</sup>	-	-	-	-	-	-	-	-	-
Physical Env. (0-6)	<b>0.145</b>	0.03	0.00	<b>0.148</b>	0.03	0.00	<b>0.146</b>	0.03	0.00
Phys <sup>2</sup> (0-6)	-	-	-	-	-	-	-	-	-
Managers <sup>d</sup>	<b>0.030</b>	0.14	0.83	<b>0.031</b>	0.14	0.82	<b>0.031</b>	0.14	0.82
Professionals <sup>d</sup>	<b>0.122</b>	0.10	0.24	<b>0.128</b>	0.10	0.22	<b>0.121</b>	0.10	0.24
Technicians & ass. professionals <sup>d</sup>	<b>0.043</b>	0.10	0.67	<b>0.046</b>	0.10	0.65	<b>0.042</b>	0.10	0.68
Clerks <sup>d</sup>	<b>0.215</b>	0.10	0.04	<b>0.217</b>	0.10	0.04	<b>0.213</b>	0.10	0.04
Service workers <sup>d</sup>	<b>0.309</b>	0.09	0.00	<b>0.308</b>	0.09	0.00	<b>0.308</b>	0.09	0.00
Agricultural and fishery <sup>d</sup>	<b>-0.138</b>	0.26	0.60	<b>-0.139</b>	0.26	0.60	<b>-0.140</b>	0.26	0.59
Craft and related trades <sup>d</sup>	<b>0.366</b>	0.11	0.00	<b>0.368</b>	0.11	0.00	<b>0.364</b>	0.11	0.00
Plant and machine operators and assemblers <sup>d</sup>	<b>0.344</b>	0.11	0.00	<b>0.346</b>	0.11	0.00	<b>0.344</b>	0.11	0.00
Bismarckian <sup>e</sup>	-	-	-	<b>-0.568</b>	0.44	0.20	-	-	-
Anglo-Saxon <sup>e</sup>	-	-	-	<b>-0.619</b>	0.58	0.29	-	-	-
Southern <sup>e</sup>	-	-	-	<b>-0.967</b>	0.41	0.02	-	-	-
Eastern <sup>e</sup>	-	-	-	<b>-1.608</b>	0.36	0.00	-	-	-
Pragmatists <sup>f</sup>	-	-	-	-	-	-	<b>-1.143</b>	0.25	0.00
Conventionals <sup>f</sup>	-	-	-	-	-	-	<b>-2.356</b>	0.64	0.00
Much Too Be Done <sup>f</sup>	-	-	-	-	-	-	<b>-1.346</b>	0.35	0.00
Other <sup>f</sup>	-	-	-	-	-	-	<b>0.041</b>	0.33	0.90

Reference categories: a) Full Time Work b) Organizational Justice High c) Hiding Feelings Low d) Elementary Occupations e) Social Democratic Regimes f) Pacesetter Regimes

#### 4.2. Model 1: Initial psychosocial and physical environment.

I will not comment on single values from model 1, as this model was primarily a test for significant variables and curvilinear effects. In terms of main theoretical constructs, the variable on emotional labour did not produce significant results for the main interesting item on hiding feelings, and was subsequently dropped from the analysis. Likewise, the dummy variable for harassment did not yield any significant results, and was dropped. Curvilinear effects were found for baseline somatic health, age, job demands and social support. No significant curvilinearity was found for baseline mental health, job control and the physical environment index, and these terms were subsequently dropped. The significant items were thus retained in model 2.

Pseudo  $R^2$  for the model is 21.10%.

#### 4.3. Model 2: Developed psychosocial and physical environment.

The use of original scores in the models necessitates some explanation of their interpretation. *Baseline somatic health* was scored on an index ranging from 0 to 10. An increase of one on the index thus results in a change in wellbeing of  $-.566$ , ( $p < 0.001$ ), if only the linear term is considered. However, the figure must be interpreted together with the squared term,  $-0.027$  ( $p < 0.01$ ). We can see that the square term moderates the linear negative effect of somatic health. To put this into perspective, values of zero on the somatic health index as well as all other variables, results in a predicted wellbeing of 17.92. Maximum value on the health index, keeping the other items at zero, results in a predicted wellbeing of  $17.92 + (10 * -.559) + (10 * .026) = 12.59$ . Thus, the somatic health index accounts for a range of wellbeing of 5.33 on the 24-point wellbeing scale, or 22.2%.

The *mental health index* ranges 0-4, with a coefficient of  $-1.206$  ( $p < 0.01$ ). The influence of mental health is thus from ( $0 * -1.206$ ) to ( $4 * -1.206$ ), or 0 to 4.82 (20%) on the wellbeing scale.

*Woman* is a variable with only two categories, simply meaning that women have an expected average wellbeing value of  $-.214$  (or about  $-0.9\%$ ) compared to men ( $p < 0.01$ ).

In terms of *age*, the linear coefficient is  $-.131$  ( $p < 0.01$ ) with a squared term of  $0.001$  ( $p < 0.01$ ). The lowest reported age in the survey is 15, and the oldest is 91, a span of 76 years. For a 15 year old, the effect on wellbeing is thus  $17,92 + (15 * -0,131) + (15 * 0,001) = 15.97$ . For a further review of the effects of age, see the predictions in chapter 5.8.

*Part time* and *overtime* are a dummy set, with full time work as the reference category. Here, we note that part time workers do not report significantly lower wellbeing than full

time workers, however, working overtime (above 48 hrs a week) negatively influences wellbeing by  $-.298$  ( $p < 0.01$ ) or about 1.25%. Contrary to expectations, people with a high degree of shift work report average higher wellbeing of .14 (around 0.6% higher).

Moving on to the *demand-control-support model*, job demands (with the squared term) account for a total decrease in wellbeing of  $-3.61$  on the wellbeing scale, or about 15%. Job control accounts for a maximum increase of wellbeing of  $2.68$  (11.1%). Social support (with square term) accounts for a maximum increase in wellbeing of around 3 points (12.5%).

*Effort-reward imbalance* accounts for an average decrease in wellbeing of  $-0.19$ , or 0.8%.

*Organizational justice* is a dummy set, and only low organizational justice is significant compared to high justice,  $-0.25$ , slightly above 1%.

In terms of the *physical environment*, the counterintuitive result is that an increase in the pressures of the physical work environment is associated with an increase in wellbeing, with a range of around 1 (4%).

Pseudo  $R^2$  for this model is 21.08%, marginally different from model 1. Around 21% of the variation in wellbeing can thus be said to be due to compositional effects.

#### **4.4. Model 3: Class.**

Model 3 is primarily a separate test on the effects of class on wellbeing. Here it is notable that most of the classes report significantly better wellbeing ( $p < 0.05$ ) than the reference category of so called “elementary workers”, the exception being skilled agricultural and fishery workers, which might be due to the relatively small sample size of 286. There also seems to be some degree of increasing wellbeing in higher classes, although this is open to interpretation. Most of the coefficients are in the 0.25-0.6 range, meaning that class accounts for around 1 to 3 percent of the differences in wellbeing.

Pseudo  $R^2$  for this model is 16.16%. The class model thus explains less of the variation in wellbeing by itself than the psychosocial model.

#### **4.5. Model 4: Psychosocial, physical and class.**

Model 4 adds the psychosocial variables together with the class variables. When compared to model 2 and 3, the most notable difference is that the top three of the class variables also turn out to be insignificant.

Pseudo  $R^2$  for this model is 21.15%. Adding class to the psychosocial model thus explains only marginally more than the psychosocial model by itself.

#### **4.6. Models 5 and 6: Welfare states and working conditions regimes.**

Models 5 and 6 were based on model 4. Model 5 adds the welfare state regimes, and model 6 adds the working conditions regimes.

In the welfare regimes model, the most interesting result is that Bismarckian and Anglo-Saxon welfare states are not associated with significantly lower wellbeing than Scandinavian ones. Pretty much as expected, though, the Eastern states perform the worst (-1.61 or around 7%), followed by the Southern states (-0.97 or around 4%).

Pseudo R<sup>2</sup> for level 1 (compositional effects) of this model is 21.15%, 66.35% for level 2 (contextual effects), and for the full model 23.71%.

The alternative model of the working conditions regimes yields significant results for all categories except “Others”, which are, as has been noted, a diverse group of countries. Here, the Conventionals (only including Croatia) fare the worst (-2.36 or 10% worse than Scandinavian), followed by the Much-To-Be-Done group (-1.35 or 6%) and the Pragmatists (-1.14 or 5% worse than Scandinavians).

Pseudo R<sup>2</sup> for level 1 (compositional effects) of this model is 21.15%, 73.85% for level 2 (contextual effects), and for the full model 24.13%.

Comparing the two models, we can see that in statistical terms, model 6 is an improvement over model 5, as it explains more of the variation at the country level. I will therefore base my analysis mainly on the results from model 6. Note that when comparing the total figures, the total variation that is explained improves by less than one percent.

#### **4.7. Predictions**

To put these results into perspective, I will do some predictions, based on model 6. First of all, what is the situation for an average worker in Europe? The average worker in Europe is a woman of 41 who works in the service sector. Other values are given in table 11 below. Coefficients are then multiplied with the values. For example, women score -0.188 lower than men on wellbeing. Raw scores for each of the variables are computed in the Sum column. To clarify the total effect of the squared terms, sub sums for the total effect of each variable are shown in the SubSum column. For example, the total effect of age is  $(41.171 * -.130) + (1695.085 * 0.001) = -5.36 + 2.32 = -3.05$ . Thus, a person of age 41 scores -3.05 points lower on wellbeing than a person of (theoretical) age zero. Overall, using the average or most common values, an average predicted score of wellbeing in Europe is thus 15.71, relatively close to the overall computed mean of 15.5.

Second, what are the maximum effects of the variables in the model? Minimum and maximum values of the effects of variables are shown in the respective columns of table 11. Total effects of squared terms are listed. Effects of class and the working conditions regimes are not shown here.

*Table 11: Average, minimum and maximum predicted effects on wellbeing.*

<b>Variable</b>	<b>Av. value</b>	<b>Coeff.</b>	<b>Sum</b>	<b>SubSum</b>	<b>Min</b>	<b>Max</b>
Wellbeing	(Cons)	18.309	18.31	18.31	-	-
Somatic Health (0-10)	2.149	-0.569	-1.22	-	0	-
Somatic <sup>2</sup>	4.617	0.027	0.13	-1.10	0	-2.94
Mental Health (0-4)	0.782	-1.203	-0.94	-0.94	0	-4.81
Age (15-91)	41.171	-0.130	-5.36	-	-	-
Age <sup>2</sup>	1695.085	0.001	2.32	-3.05	-1.65	-0.54
Job Demands (0-25)	10.102	-0.152	-1.53	-	0	-
JobDemands <sup>2</sup>	102.049	0.004	0.45	-1.08	0	-1.04
Job Control (0-25)	14.052	0.111	1.56	1.56	0	2.78
Social Support (0-25)	17.945	0.006	0.10	-	0	-
Social Support <sup>2</sup>	322.020	0.005	1.59	1.69	0	3.23
Physical Envir. (0-6)	1.282	0.146	0.19	0.19	0	0.88
Women	1.000	-0.188	-0.19	-0.19	-	-
Service	1.000	0.308	0.31	0.31	-	-
<b>Prediction:</b>			<b>15.71</b>	<b>15.71</b>	<b>16.66</b>	<b>15.86</b>

Some additional effects of other common dummy coded variables are given below in table 12.

*Table 12: Additional predicted effects on wellbeing.*

<b>Additional effects</b>			
<i>Psychosocial</i>		<i>WCR</i>	
Overtime	-0.29	Pragmatists	-1.14
Shift Work High	0.13	Conventionals	-2.36
Discrimination	-0.33	MTBD	-1.35
ERI	-0.18		
Organizational Justice Low	-0.27		

For the linear terms (mental health, job control and physical environment) as well as for the dummy coded variables, the table provides a reasonable good overview of the overall predicted effects of the coefficients. For the squared terms, the effects are more complex. For example, scoring 0 on job demands has almost the same effect as scoring 25, due to the curvilinear effects. I will therefore present these predictions graphically to make interpretations more intuitive. Selected terms, including some linear terms for comparison, are presented in the table below. All other coefficients are set at zero, so the predictions are not necessarily realistic in and of themselves; the main ambition here is to show the isolated effects of variables.



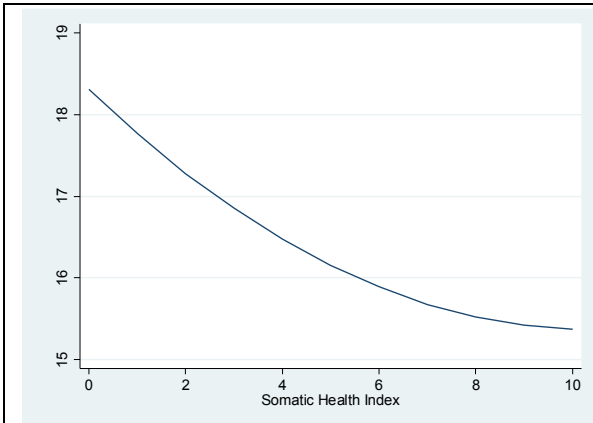


Figure 14: Predicted effects of somatic health conditions on wellbeing\*.

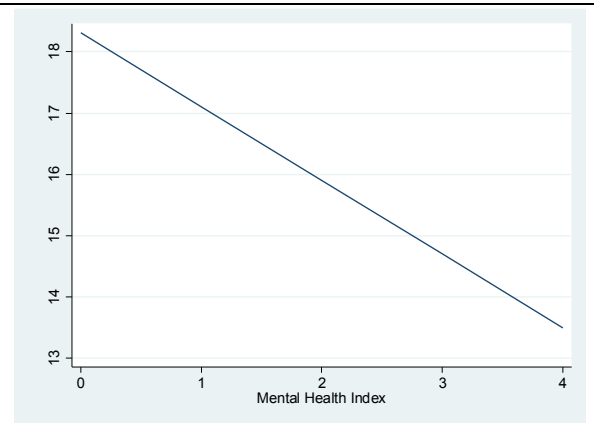


Figure 15: Predicted effects of mental health conditions on wellbeing\*.

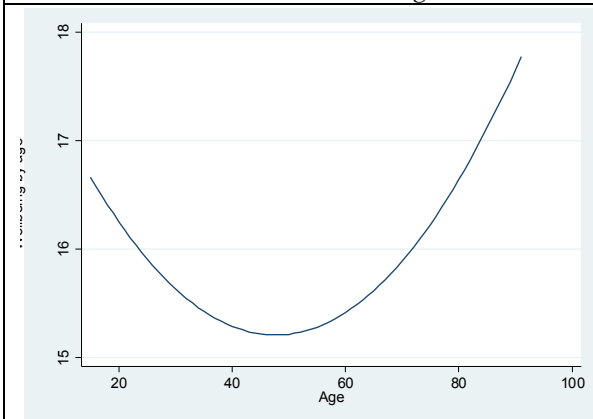


Figure 16: Predicted effects of age on wellbeing\*.

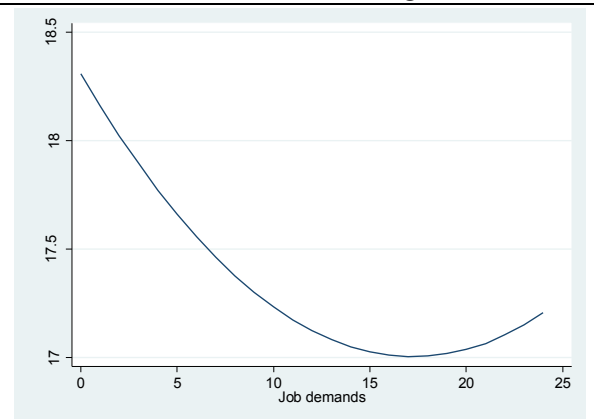


Figure 17: Predicted effects of job demands on wellbeing\*.

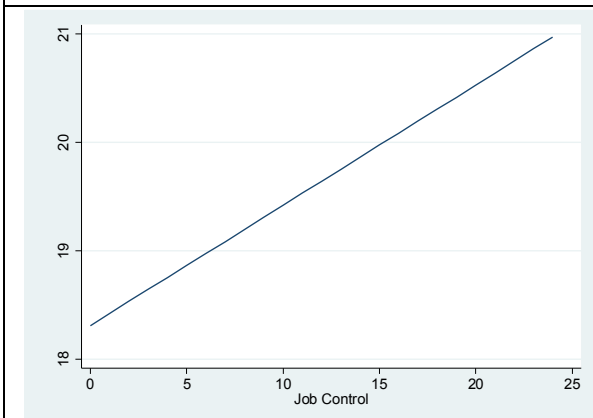


Figure 18: Predicted effects of job control on wellbeing\*.

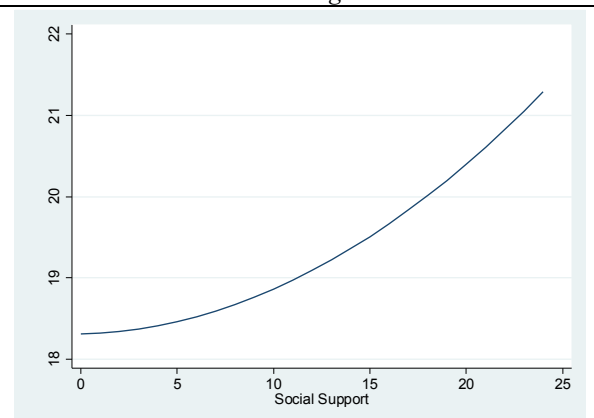


Figure 19: Predicted effects of social support on wellbeing\*.

\*) All other coefficients set at zero

First, it is important to note that the slopes of the curves cannot be compared graphically between models, as they are scaled differently. The somatic health index (figure 14) is relatively linear, that is: an increase of somatic health problems is uniformly associated with lower wellbeing, accounting for around 3 points on the wellbeing scale. Additional health issues beyond single problems (i.e. muscle pain in addition to CVD) only lead to

slightly lower predicted wellbeing. However, additional mental health issues (figure 15) show a linear pattern, with each single type of symptom leading to a one point decrease in wellbeing, accounting for around 5 points total on the wellbeing scale. Age (figure 16) has perhaps the most interesting pattern: Wellbeing starts at a peak around age 16, decreasing by almost two points to around age 40, before increasing again. Interestingly, it seems that being able to hold on to your job into old age is associated with substantial benefits for wellbeing. Age accounts for around two points variation on the wellbeing scale.

Now, with regards to the demand-control-support model, the overall effects appear to be rather complex. Job demands (figure 17) are similar to age in that low values are associated with high wellbeing. From then on, increasing demands are associated with lower wellbeing up until around 16 on the job demands scale. From then on, increased demands are correlated with higher wellbeing, although wellbeing does not revert to former peak values. The positive effect of increased demands is thus limited. Job demands account for around 1.5 points variation on the wellbeing scale. Job control (figure 18), in comparison, shows a positive linear effect, accounting for around 2.5 points. Social support (figure 19) has an interesting exponential effect, with more social support leading to overproportional increases in wellbeing, accounting for almost 3 points on the scale.

Summing up, the person with highest predicted wellbeing would thus be a relatively young or rather old man, with no somatic or mental health issues, with very low job demands and very high job control and social support. He would be working as a craftsman somewhere in a pacesetter country. Other coefficients held at zero, he would score around 23.5 on the wellbeing scale. Conversely, the person with the lowest predicted wellbeing would be a middle aged woman with multiple somatic and mental health concerns, with relatively high job demands, low job control and low social support. She would be working in an elementary occupation in a much-to-be done country. She would score around 5 on the wellbeing scale, all other variables kept at zero.

## 5. Discussion: Working conditions and wellbeing

Based on the presented models, it is now time to review the findings and hold them up against the expectations. Which model is best suited to base the conclusions on? The evidence for the psychosocial theories tends to stay fairly robust throughout the different models. In terms of class, the results are significantly changed when combined with the psychosocial theories, but the analyses of regime typologies do not influence the individual level variables to a large extent. This points towards deciding to focus on the welfare state model or the working conditions regimes model. As the working conditions regimes model explains more of the variance between nations, as well as yielding more significant results, it appears to be the best model overall.

I will review the findings for each theory, based on model 6, but I would first like to summarize what I consider to be the most important findings. In terms of the psychosocial environment, the demand-control-support model emerges as the most prominent source of wellbeing in the workplace, with social support in particular contributing to over 3 points on the 25 point wellbeing scale. Furthermore, social support has an exponential effect.

In terms of class, the most important finding is that there are significant differences in wellbeing among the lower classes, but not in the highest. The differences are rather modest, mainly in the 0.3 range.

The working conditions regimes reveal significant differences in wellbeing among employees in Europe. The main divide goes between the Pacesetters on one hand, and the pragmatists and Much-To-Be-Done countries on the other. The latter score around -1.1 and -1.3 respectively on the wellbeing scale compared to Pacesetters.

### 5.1. The demand-control-support model

In terms of the demand-control-support model, all variables did indeed turn out to influence wellbeing significantly throughout all models. Previous theory suggests that some degree of job demands increase wellbeing, whereas too many demands will decrease it. The graphed prediction is at odds with this, showing that job demands decrease wellbeing up to somewhere beyond 15, but from that point on, job demands actually *increase* wellbeing, although not substantially so.

These findings allow us to examine the *strain hypothesis*, namely that a combination of high demands and low control should be associated with lower wellbeing. If we see these measures as *additive* measures, the hypothesis seems to be supported in the main: both high

demands and low control is associated with lower wellbeing. The hypothesis that jobs combining high demands with high control are beneficial to wellbeing is supported by the fact that wellbeing increases with extra high demands. As the curvilinear effects of job demands imply, though, there could be more complex effects at play: it could in fact be that job demands and job control interact in a *multiplicative* way, with unpredictable results. This calls for further research into the relationship between demands and control.

*Social support* is found to be curvilinear, as shown in the figure below. Social support has an *exponential* effect on wellbeing. Discrimination and harassment can be seen as measures of negative social support. These measures are not directly comparable to the measures on social support. However, only the measure for discrimination in the workplace turned out to significantly influence wellbeing. Discrimination has much less influence totally on wellbeing than social support, though. Interventions towards higher social support in the workplace should therefore be of the highest importance in human resource management.

## **5.2. Effort-reward imbalance**

ERI, as conceptualized here, does indeed turn out to have a significantly negative effect on wellbeing. It was not possible to test all aspects of the theory, due to limitations in the data material. In the current context, the effects of ERI were found to be rather modest in comparison with the DCSM, contrary to expectations.

## **5.3. Organizational justice**

Organizational justice, conceived of here in an institutional frame, did indeed turn out to significantly influence wellbeing, although only for low scores, meaning those employers who do not have access to any employee representatives and collective meetings. The EWCS lacks data on organizational justice both at the individual and at the institutional level. In terms of the individual level, this can only be corrected by adding more items on the topic of justice. In terms of institutional justice, data could be added from an external source. The Work Security Index is to some extent such a source, in that it for example measures the ratification of ILO conventions. It would however be preferable to have more detailed data on legal institutions influencing working conditions. For further discussion on the relationship between justice and the working conditions regimes, see discussion on the working conditions regimes below.

#### **5.4. Emotional labour**

The measures of high emotional labour did not turn out to be significant, and were dropped from the analysis. This could very possibly be due to limitations in the data material.

#### **5.5. The physical environment**

Results from the measures on the physical work environment turned out to be counterintuitive. The data material suggests that increases in the load of the physical work environment are actually correlated with *increased* wellbeing. How could this be? One possible explanation is that a work environment that is totally devoid of physical challenges is unstimulating, and thus detrimental to wellbeing. Another explanation is that a single measure of the physical environment is too simplistic. Perhaps some elements of the physical work environment are more correlated with positive wellbeing, whereas others are detrimental? There is good reason to read the current results with some degree of suspicion, and question the nomological validity of the measure of the physical environment.

#### **5.6. Social class**

The expectation was that there should be class differences in wellbeing among employees, and the possibility that there could be relational differences between upper and lower classes. Results vary somewhat between models, and I will compare the results of model 3 (class only), model 4 (class and psychosocial theories), as well as model 6 (class, psychosocial and working conditions regimes).

Model 3 suggests that there are indeed class differences in wellbeing. The results are somewhat ambiguous; however I would argue that they point more towards a positional understanding of class differences with a social gradient, than towards relational differences between upper and lower classes.

When combining class with the psychosocial theories in model 3, the picture changes. Differences between upper classes and elementary occupations are no longer significant. Additionally, the differences between classes seem to even out, with all significant results being in the 0.2-0.4 range. Adding the level 2 Work Security variables in model 6 does little to change the effect of class compared to model 3. All the while, the coefficients for the psychosocial variables change relatively little when combined with class.

What could be affecting the change in the class effects between model 3 and 4 and beyond? One possible explanation is that the psychosocial theories and class theories to some extent are expressions of the same phenomena, and that stress in the form of job demands or

ERI is unevenly distributed along class lines, but that there is greater variation in the upper classes. Further research into the relationship between psychosocial theories and class seems warranted.

### **5.7. Welfare states and the working conditions regimes.**

The welfare states model (model 5) found no significant differences in wellbeing among the Social Democratic, Bismarckian and Anglo-Saxon regimes. The difference between Social Democratic, Southern and Eastern regimes is significant, and of considerable magnitude. The working conditions regimes (model 6), however, shows significant differences between all regimes compared to the Pacesetters, with the exception of the “Others” category. The “Conventional” category only contains one country, Croatia, so the main theoretical interest of the WCR in this study lies in comparing Pacesetters, Pragmatists and Much-to-be-done countries. (Croatia scored rather badly on average wellbeing, as well as being one of the countries most severely hit by the financial crisis, so it is not much of a surprise that it did in fact turn out to be significant on its own.) Much as expected, the Pacesetters clearly do best on wellbeing, followed by Pragmatists and MTBD. The differences between the latter two are not quite as large. Thus, the Pragmatists cannot be said to perform quite as well as expected.

Why does the welfare regimes model fail to produce significant results for several categories? When comparing the two typologies, most of the countries in the MTBD category fall into the Eastern category of welfare states. The pragmatist countries are mainly made up of Eastern states, however there are Bismarckian, Southern and Eastern countries included as well. Additionally, the Anglo-Saxon states fall into the Pragmatist category. The pacesetter countries are mainly made up of Scandinavian and Bismarckian regimes, although there are also Southern and Eastern countries represented. The working conditions regimes thus can be seen as collapsing the Scandinavian and Bismarckian states into one group, while diversifying the Eastern states into mainly two groups, together with the Anglo-Saxons. What exactly is it that separates the welfare regimes model from the working conditions regimes? To answer this question, I will begin by reviewing the theoretical basis of the WCR.

At face value, the working conditions regimes seem like a reasonable alternative to the welfare state typology when studying working conditions and work-related health and wellbeing. However, there appears to be a need for discussion on what mechanisms that lie behind the WCR. In the case of the welfare state regimes, there are several theoretical distinctions that can be drawn between the different regimes. One such difference is

universalism versus earnings related access to welfare. Another is the way that welfare provision is seen as divided differently between market, state and family in different regimes.

The Work Security Index is the basis of the working conditions regimes. It consists of three indicators, and is mainly descriptive in nature. I will review the construction of the WSI in relation to possible underlying mechanisms.

First of all, the WSI consists of input indicators, such as to what extent nations have ratified ILO Conventions. It should not really come as a surprise that countries that have ratified more conventions should score better in health related outcomes. What is not apparent is what has led some countries to ratify more conventions than others. One possibility that comes to mind is that the input indicators are really a measure of the strength of the national labour unions. Seeing this from the Norwegian perspective, the Norwegian work regime is characterized by powerful unions, which have long been highly associated politically with the Labour party (Levin et al. 2012), and strong centralized tripartite collaboration. Still, France is also referred to as a Pacesetter, while having a low union density, and very weak central tripartite collaboration (Hernes 2008). The theoretical underpinnings of the input indicators are therefore uncertain.

The WSI contains process indicators, which measure the existence and efficacy of structures that are in place to implement laws and regulations. Once again, these indicators are descriptive. We cannot tell from the index itself what social process that has put these structures into place.

Finally, the WSI contains outcome indicators to gauge the implementation of laws and regulations. One such indicator is the work related fatal injury rate. Once again, it should come as no surprise that a high score on the output indicator is correlated with higher wellbeing. In this sense, using the WSI to analyse national differences is a circular exercise: Countries that are reported to have good outcomes are predict to have good outcomes. Particularly worrisome is the fact that outcomes are given double weight in the scoring of the index. In the current context, it would perhaps be preferable to use only input and process indicators in the index.

The WSI thus does not give a clear answer to what social mechanisms cause differences in work-related wellbeing. There appears to be a need for further theorizing the WSI to analyse exactly what causes countries to ratify and implement conventions to different degrees, for example.

Based on the theories presented so far in this thesis, I would posit the idea that the WSI in many ways is conceptually compatible with the theories on justice. The WSI, and its input

indicators in particular, has a strong emphasis on the legal protection of workers. The theory of organizational justice emphasises justice as it is experienced at the individual level. I would argue that it is necessary to supplement this with a macro-oriented perspective.

I would argue that justice at the institutional level incorporates elements of both distributive and procedural justice. The welfare state is very much a distributive mechanism, and it could be argued that the WSI captures some of this distributive function. Legal institutions also carry a lot of responsibility for procedural justice. Any legal system depends on legitimacy if it is to survive in the long term, so it follows that employees need to perceive the system as fair in terms of individual outcomes. However, I would argue that justice at an institutional level goes beyond the issue of subjective perception. A legal system could be designed in such a way that it could appear to be in accordance with all the criteria of procedural justice, but still produce social inequalities. Furthermore, these inequalities could be seen as fair outcomes by the same people who suffer them, what Marxism would call *false consciousness* (Morrison 2006:62). From an objectivist viewpoint, it could be argued that the legal system in Pacesetter countries are better in that they provide better protection for the workers, regardless of subjective perception.

A final weakness of the WSI typology is that as of today, several European countries are not included in the index. At face value, Cyprus, Macedonia, Kosovo, Malta and Montenegro do not seem to share a lot of common features, and would quite possibly be able to fit into one of the existing categories given available and reliable data. It has been beyond the scope of the current study to look into scoring these countries on the index.

### **5.8. Micro versus meso and macro factors**

The intra class correlation showed that around 5.6% of the variation in wellbeing stems from variation between countries. This might appear a modest figure. Psychological research on wellbeing in general has suggested that only around 10% of variations in subjective wellbeing can be attributed to circumstances (Lyubomirsky 2007:20). By such a yardstick, accounting for more than 5% of the variation in employee wellbeing due to national differences appears to be a sizeable figure.

Then there is the issue of how much of this variation we have been able to explain. At the psychosocial level, the demand-control-support emerges as the most influential theory, with maximum values of social support in particular accounting for more than 3 points on the wellbeing scale, with an average value of around 1.5. Social class appears to be much less important, influencing wellbeing no more than maximum 0.3-0.4 points. National differences



land somewhere in between, in the 1.1 to 2.4 range. For the average values, this means that national differences are about as influential as the DCSM.

When we look at explained variances at each level, we see that level one has an explained variance (pseudo R square) of around 21%, whereas the working conditions regimes explained around 74% of the variance at level 2. This certainly indicates that national differences and the working conditions regimes are worthy of further research. Given the imprecise category of “Others”, a further development of the working conditions regimes typology should be able to improve this figure even further.

We can not tell directly from these number that working conditions are worse in the lowest scoring groups, but the findings certainly suggest further research into national differences.

### **5.9. Subjectivism vs objectivism**

Approaching the results from a more philosophical perspective, the relationship between the subjective and the objective views of knowledge has been an undercurrent to all of the theoretical positions presented herein. I would argue that concepts of idealism versus materialism and structural versus transactional are both variations of the underlying subjective/objective dialectic.

To put this in more concrete terms: Should we view the relationship between working conditions and wellbeing primarily as a subjective relationship, where differences in individual appraisals and coping strategies are the main source of differences in wellbeing? This would place the determinants of wellbeing in more of a psychological frame of understanding. Or should we view the relationship as primarily an objective relationship, where wellbeing is seen as determined by external factors in the environment? This would place the determinants of wellbeing in more of a sociological frame of understanding.

My answer to these questions is that it appears that both frames of understanding are valid, and that it is hard, based on the results presented here, to offer any one perspective primacy. However, the structural approach seems to have been the one given the least attention in previous research, and as such is worthy of further study. I will rephrase the above two questions and ask: What can we learn from the significant differences in wellbeing in European countries? The results certainly could be interpreted in a Durkheimian fashion: The differences in wellbeing among employees in Europe must be seen as caused by differences in the societies. The typology of the working conditions regimes suggests that the organization of labour markets has a significant influence on employee wellbeing. As I have

pointed out, employees in Europe might use different reference groups in their subjective assessment of wellbeing, based on economic, political and historic events. However, the results certainly suggest that further research into national differences in employee wellbeing in Europe is warranted.

## 6. Conclusion

Returning now to the main research question: *What are the effects of working conditions on wellbeing in Europe?* The results indicate that all the perspectives presented herein are relevant to understanding the determinants of employee wellbeing.

First, regarding the individual level psychosocial, physical and contractual conditions: For the average worker, social support appears to be one of the most important sources of wellbeing in the workplace, followed by job control. Job demands contribute negatively towards wellbeing; however, the impact is somewhat less substantial. Contractual conditions in the form of working hours and working time account for relatively little, as do the constructs for discrimination, effort-reward imbalance and organizational justice. Emotional labour and harassment were not found to contribute significantly. A puzzling result is the finding that demands in the physical work environment contribute positively towards wellbeing.

Second, regarding the effects of class. There were significant effects among the lower occupational classes, as compared to elementary occupations. However, upper class occupations did not have significantly different wellbeing compared to the same reference group, which is a surprising finding. The effects of class were relatively modest, though, much in the same range as the lesser psychosocial effects.

Third, regarding national differences in wellbeing. There were only significant differences in wellbeing between the social democratic and the southern and eastern welfare regimes. The working conditions regimes provided more significant results, with pragmatists, conventionals and MTBDs all scoring significantly worse on wellbeing, although the main divide goes between the pacesetters and the rest of the categories. For the average worker, the items in the demand-control-support model still had about the same of an effect on wellbeing as did national differences.

Psychosocial theories are well established in the field of working conditions research, and the current study has not added all that much to current knowledge at this level, as most of the expectations have been confirmed. Conceptually, I would like to see a further development on the issue of organizational justice at the institutional level. In terms of social

class, the results are perhaps more modest than expected, and they do not give a clear answer on whether the effects should be seen as positional or relational. The finding that higher classes were not associated with significantly higher wellbeing was slightly surprising, and could be further looked into.

But the main new perspective this thesis helps puts forward is the conception of working conditions regimes based on the Work Security Index. This typology emerges as an alternative to the well-established theory on welfare state regimes to explain health related outcomes in working life, but it is in need of further theorizing and research.

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## 8. Appendix

Total N=32.366 for all variables after mean imputation.

### 8.1. Descriptive statistics for categorical variables (in percentages).

*Table A: Descriptive statistics for categorical variables (in percentages).*

<b>Variable</b>	<b>Value 0</b>	<b>Value 1</b>
<i>Individual level</i>		
Women	48.98	51.02
Part Time Work (1-29 h/w)	86.24	13.76
Full Time Work (3 -48 h/w)	24.31	75.69
Overtime Work (49-168 h/w)	89.45	10.55
Shift Work High	80.12	19.88
Discrimination	93.35	6.65
Harassment	83.62	16.38
Emotional Labour High	71.42	28.58
Emotional Labour Low	30.55	69.45
Emotional Labour Other	98.03	1.97
ERI (High efforts, low rewards)	65.03	34.97
Organizational Justice High	62.66	37.34
Organizational Justice Med	67.70	32.30
Organizational Justice Low	69.65	30.35
<i>Class</i>		
1 Legislators, senior officials and managers	94.67	5.33
2 Professionals	84.20	15.80
3 Technicians and associate professionals	84.09	15.91
4 Clerks	87.76	12.24
5 Service workers , shop and market sales workers	81.67	18.33
6 Skilled agricultural and fishery workers	99.12	0.88
7 Craft and related trades workers	88.54	11.46
8 Plant and machine operators and assemblers	90.87	9.13
9 Elementary occupations	89.08	10.92
<i>Welfare regimes</i>		
Anglo-Saxon	93.76	6.24
Bismarckian	78.40	21.60
Eastern	64.33	35.67
Scandinavian	89.24	10.76
Southern	81.53	18.47
<i>Working conditions regimes</i>		
Conventionals	97.38	2.62
Pacesetters	51.40	48.60
Pragmatists	71.74	28.26
Much To Be Done	90.18	9.82
Other	89.31	10.69

## 8.2. Descriptive statistics for continuous variables

Table B: Descriptive statistics for continuous variables

Variable	Mean	SD	Min	Max
Wellbeing	15.46	4.91	0	24
Somatic Health	2.15	1.90	0	10
Mental Health	0.78	0.95	0	4
Age	41.17	11.61	15	91
Job Demands	10.10	4.30	0	24
Job Control	14.05	4.66	0	24
Social Supp	17.94	5.28	0	24
Physical Environment	1.28	0.94	0	6

## 8.3. A non-technical guide to interpreting the multilevel models.

This section has been written to allow people who are not trained in regression analysis to interpret the results.

The interpretation starts with reviewing the coefficient value of the constant. This value is the predicted value of wellbeing with all variables set to the value of zero or the reference category. For example, in model 1, wellbeing would be predicted to be 17.91 on a 25 point scale, given that the person scored zero on the somatic and health indices, zero on being a women, (i.e., was a man) etc. In some cases, these values are not realistic, as no individual in the survey was actually zero years of age, for example.

Next, review the coefficients. One unit change in the explanatory variable yields one unit change in the dependent variable. Taking age as an example, in model 1, an increase in age of one year is associated with a change in wellbeing of  $-.132$ , a decrease. A one point increase in job demands is associated with a change in wellbeing of  $-.125$ . The demands scale ranges from 0-25, so the effects of the coefficients are not directly comparable. Each coefficient has to be reviewed with regards to the original scale.

Interpretation of age is complicate by the fact that a squared term is added. This is done to check if the effects of age or linear or curved. If the effects are found to be linear, both the original age term, as well as the squared term, has to be taken into consideration. For example, an age value of 20 in model 1 predicts a change in wellbeing of  $(20 * -.132) + (20^2 * 0.001) = -2.64 + 0.4 = -2.24$  compared to the theoretical value of zero years of age.

Model 3 adds a set of class variables. A respondent can only belong to one of these, and the coefficient compares against a reference category, in this case elementary occupations. In model 3, a service worker thus scores 0.613 better in wellbeing than an elementary worker.

That covers the necessary tools for reading the coefficients. Next, the column SE refers to the standard errors of the coefficients. This is a technical statistical term, which is defined

as “the standard deviation of the sampling distribution of a statistic” (Ringdal 2007:343). In layman’s terms, it refers to the uncertainty of the true value of the coefficient in the population the sample was taken from. This figure is not essential to interpreting the results.

The third column, marked  $P > z$ , is vital to interpretation. In technical terms, the p value is defined as “the probability of obtaining a test statistic result at least as extreme as the one that was actually observed, assuming that the null hypothesis is true” (Ringdal 2007:240). For the layman, it will suffice to know that any p value less than 0.05 indicates that the results are *statistically significant* at the typical 0.05 level, meaning that it is very unlikely that the effects of the coefficients are random, and that we can generalize the findings to the general population of employees.

#### 8.4. Complete results from the multilevel analysis.

Table C: Complete results for model 1: Psychosocial.

Wellbeing	Coef.	SE	z	$P > z$	[95% CI]	
(Constant)	<b>17.919</b>	0.40	45.05	0.00	17.14	18.70
Somatic Health (0-10)	<b>-0.559</b>	0.04	-15.73	0.00	-0.63	-0.49
Somatic <sup>2</sup> (0-10)	<b>0.026</b>	0.01	4.65	0.00	0.02	0.04
Mental Health (0-4)	<b>-1.259</b>	0.07	-17.75	0.00	-1.40	-1.12
Mental <sup>2</sup> (0-4)	<b>0.020</b>	0.02	0.82	0.41	-0.03	0.07
Women	<b>-0.222</b>	0.05	-4.37	0.00	-0.32	-0.12
Age	<b>-0.132</b>	0.01	-9.46	0.00	-0.16	-0.10
Age <sup>2</sup>	<b>0.001</b>	0.00	8.31	0.00	0.00	0.00
Part Time <sup>a</sup>	<b>-0.064</b>	0.07	-0.88	0.38	-0.21	0.08
Over Time <sup>a</sup>	<b>-0.298</b>	0.08	-3.53	0.00	-0.46	-0.13
Shift Work High	<b>0.145</b>	0.06	2.33	0.02	0.02	0.27
Job Demands (0-25)	<b>-0.145</b>	0.02	-6.39	0.00	-0.19	-0.10
Demands <sup>2</sup> (0-25)	<b>0.004</b>	0.00	3.88	0.00	0.00	0.01
Job Control(0-25)	<b>0.114</b>	0.03	4.39	0.00	0.06	0.17
Control <sup>2</sup> (0-25)	<b>0.000</b>	0.00	-0.31	0.75	0.00	0.00
Social Support (0-25)	<b>0.006</b>	0.02	0.27	0.79	-0.04	0.05
Support <sup>2</sup> (0-25)	<b>0.005</b>	0.00	7.16	0.00	0.00	0.01
Discrimination High	<b>-0.326</b>	0.10	-3.28	0.00	-0.52	-0.13
Harassment High	<b>-0.056</b>	0.07	-0.79	0.43	-0.20	0.08
ERI	<b>-0.193</b>	0.06	-3.50	0.00	-0.30	-0.08
Justice Low <sup>b</sup>	<b>-0.253</b>	0.06	-3.97	0.00	-0.38	-0.13
Justice Med. <sup>b</sup>	<b>-0.047</b>	0.06	-0.81	0.42	-0.16	0.07
Hide Feelings <sup>c</sup>	<b>0.031</b>	0.05	0.57	0.57	-0.08	0.14
Feelings Other <sup>c</sup>	<b>-0.535</b>	0.17	-3.10	0.00	-0.87	-0.20
Physical Env. (0-6)	<b>0.169</b>	0.07	2.51	0.01	0.04	0.30
Phys <sup>2</sup> (0-6)	<b>0.001</b>	0.02	0.08	0.94	-0.03	0.04

Reference categories: a) Full Time Work b) Organizational Justice High c) Hiding Feelings Low d) Elementary Occupations e) Social Democratic Regimes f) Pacesetter Regimes

Table D: Complete results for model 2: Psychosocial, developed.

Wellbeing	Coef.	SE	z	P>z	[95% CI]
(Constant)	<b>17.911</b>	0.38	47.44	0.00	17.17 18,65
Somatic Health (0-10)	<b>-0.566</b>	0.03	-16.32	0.00	-0.63 -0,50
Somatic <sup>2</sup> (0-10)	<b>0.027</b>	0.01	4.90	0.00	0.02 0,04
Mental Health (0-4)	<b>-1.206</b>	0.03	-40.38	0.00	-1.26 -1,15
Women	<b>-0.214</b>	0.05	-4.24	0.00	-0.31 -0,12
Age	<b>-0.131</b>	0.01	-9.42	0.00	-0.16 -0,10
Age <sup>2</sup>	<b>0.001</b>	0.00	8.28	0.00	0.00 0,00
Part Time <sup>a</sup>	<b>-0.064</b>	0.07	-0.87	0.39	-0.21 0,08
Over Time <sup>a</sup>	<b>-0.298</b>	0.08	-3.54	0.00	-0.46 -0,13
Shift Work High	<b>0.147</b>	0.06	2.37	0.02	0.03 0,27
Job Demands (0-25)	<b>-0.145</b>	0.02	-6.41	0.00	-0.19 -0,10
Demands <sup>2</sup> (0-25)	<b>0.004</b>	0.00	3.89	0.00	0.00 0,01
Job Control (0-25)	<b>0.107</b>	0.01	17.88	0.00	0.10 0,12
Social Support (0-25)	<b>0.007</b>	0.02	0.34	0.73	-0.03 0,05
Support <sup>2</sup> (0-25)	<b>0.005</b>	0.00	7.15	0.00	0.00 0,01
Discrimination High	<b>-0.332</b>	0.10	-3.39	0.00	-0.52 -0,14
ERI	<b>-0.191</b>	0.06	-3.47	0.00	-0.30 -0,08
Justice Low <sup>b</sup>	<b>-0.253</b>	0.06	-3.98	0.00	-0.38 -0,13
Justice Med. <sup>b</sup>	<b>-0.047</b>	0.06	-0.81	0.42	-0.16 0,07
Physical Env. (0-6)	<b>0.171</b>	0.03	5.91	0.00	0.11 0,23

Reference categories: a) Full Time Work b) Organizational Justice High c) Hiding Feelings Low d) Elementary Occupations e) Social Democratic Regimes f) Pacesetter Regimes

Table E: Complete results for model 3: Class.

Wellbeing	Coef.	SE	z	P>z	[95% CI]
(Constant)	<b>19.679</b>	0.34	58.02	0.00	19.01 20.34
Somatic Health (0-10)	<b>-0.638</b>	0.04	-18.01	0.00	-0.71 -0.57
Somatic <sup>2</sup> (0-10)	<b>0.030</b>	0.01	5.28	0.00	0.02 0.04
Mental Health (0-4)	<b>-1.338</b>	0.03	-44.10	0.00	-1.40 -1.28
Women	<b>-0.282</b>	0.05	-5.14	0.00	-0.39 -0.17
Age	<b>-0.117</b>	0.01	-8.14	0.00	-0.14 -0.09
Age <sup>2</sup>	<b>0.001</b>	0.00	7.50	0.00	0.00 0.00
Part Time <sup>a</sup>	<b>-0.023</b>	0.08	-0.30	0.76	-0.17 0.13
Over Time <sup>a</sup>	<b>-0.348</b>	0.09	-4.03	0.00	-0.52 -0.18
Shift Work High	<b>0.015</b>	0.06	0.23	0.82	-0.11 0.14
Managers <sup>d</sup>	<b>0.866</b>	0.13	6.57	0.00	0.61 1.12
Professionals <sup>d</sup>	<b>0.911</b>	0.10	9.35	0.00	0.72 1.10
Technicians & ass. professionals <sup>d</sup>	<b>0.652</b>	0.10	6.69	0.00	0.46 0.84
Clerks <sup>d</sup>	<b>0.489</b>	0.10	4.74	0.00	0.29 0.69
Service workers <sup>d</sup>	<b>0.613</b>	0.10	6.45	0.00	0.43 0.80
Agricultural and fishery <sup>d</sup>	<b>0.260</b>	0.27	0.96	0.34	-0.27 0.79
Craft and related trades <sup>d</sup>	<b>0.677</b>	0.11	6.38	0.00	0.47 0.89
Plant & machine ops. & assemblers <sup>d</sup>	<b>0.249</b>	0.11	2.23	0.03	0.03 0.47

Reference categories: a) Full Time Work b) Organizational Justice High c) Hiding Feelings Low d) Elementary Occupations e) Social Democratic Regimes f) Pacesetter Regimes

Table F: Complete results for model 4: Psychosocial + class.

<b>Wellbeing</b>	<b>Coef.</b>	<b>SE</b>	<b>z</b>	<b>P&gt;z</b>	<b>[95%</b>	<b>CI]</b>
(Constant)	<b>17.705</b>	0.38	46.36	0.00	16.96	18.45
Somatic Health (0-10)	<b>-0.567</b>	0.03	-16.34	0.00	-0.63	-0.50
Somatic <sup>2</sup> (0-10)	<b>0.027</b>	0.01	4.92	0.00	0.02	0.04
Mental Health (0-4)	<b>-1.202</b>	0.03	-40.20	0.00	-1.26	-1.14
Women	<b>-0.188</b>	0.05	-3.52	0.00	-0.29	-0.08
Age	<b>-0.130</b>	0.01	-9.30	0.00	-0.16	-0.10
Age <sup>2</sup>	<b>0.001</b>	0.00	8.21	0.00	0.00	0.00
Part Time <sup>a</sup>	<b>-0.050</b>	0.07	-0.68	0.50	-0.20	0.09
Over Time <sup>a</sup>	<b>-0.300</b>	0.08	-3.54	0.00	-0.47	-0.13
Shift Work High	<b>0.127</b>	0.06	2.01	0.04	0.00	0.25
Job Demands (0-25)	<b>-0.151</b>	0.02	-6.67	0.00	-0.20	-0.11
Demands <sup>2</sup> (0-25)	<b>0.004</b>	0.00	4.13	0.00	0.00	0.01
Job Control (0-25)	<b>0.111</b>	0.01	17.54	0.00	0.10	0.12
Social Support (0-25)	<b>0.006</b>	0.02	0.29	0.78	-0.03	0.05
Support <sup>2</sup> (0-25)	<b>0.005</b>	0.00	7.18	0.00	0.00	0.01
Discrimination High	<b>-0.328</b>	0.10	-3.34	0.00	-0.52	-0.14
ERI	<b>-0.179</b>	0.06	-3.23	0.00	-0.29	-0.07
Justice Low <sup>b</sup>	<b>-0.271</b>	0.06	-4.21	0.00	-0.40	-0.15
Justice Med. <sup>b</sup>	<b>-0.056</b>	0.06	-0.95	0.34	-0.17	0.06
Physical Env. (0-6)	<b>0.145</b>	0.03	4.63	0.00	0.08	0.21
Managers <sup>d</sup>	<b>0.030</b>	0.14	0.22	0.83	-0.24	0.30
Professionals <sup>d</sup>	<b>0.122</b>	0.10	1.18	0.24	-0.08	0.32
Technicians & ass. professionals <sup>d</sup>	<b>0.043</b>	0.10	0.43	0.67	-0.16	0.24
Clerks <sup>d</sup>	<b>0.215</b>	0.10	2.06	0.04	0.01	0.42
Service workers <sup>d</sup>	<b>0.309</b>	0.09	3.30	0.00	0.13	0.49
Agricultural and fishery <sup>d</sup>	<b>-0.138</b>	0.26	-0.53	0.60	-0.65	0.38
Craft and related trades <sup>d</sup>	<b>0.366</b>	0.11	3.48	0.00	0.16	0.57
Plant & machine ops. & assemblers <sup>d</sup>	<b>0.344</b>	0.11	3.14	0.00	0.13	0.56

Reference categories: a) Full Time Work b) Organizational Justice High c) Hiding Feelings Low  
d) Elementary Occupations e) Social Democratic Regimes f) Pacesetter Regimes

Table G: Complete results for model 5: Psychosocial, class and welfare regimes.

<b>Wellbeing</b>	<b>Coef.</b>	<b>SE</b>	<b>z</b>	<b>P&gt;z</b>	<b>[95%</b>	<b>CI]</b>
(Constant)	<b>18.738</b>	0.47	40.17	0.00	17.82	19.65
Somatic Health (0-10)	<b>-0.568</b>	0.03	-16.37	0.00	-0.64	-0.50
Somatic <sup>2</sup> (0-10)	<b>0.027</b>	0.01	4.93	0.00	0.02	0.04
Mental Health (0-4)	<b>-1.199</b>	0.03	-40.12	0.00	-1.26	-1.14
Women	<b>-0.189</b>	0.05	-3.54	0.00	-0.29	-0.08
Age	<b>-0.130</b>	0.01	-9.30	0.00	-0.16	-0.10
Age <sup>2</sup>	<b>0.001</b>	0.00	8.20	0.00	0.00	0.00
Part Time <sup>a</sup>	<b>-0.055</b>	0.07	-0.74	0.46	-0.20	0.09
Over Time <sup>a</sup>	<b>-0.295</b>	0.08	-3.49	0.00	-0.46	-0.13
Shift Work High	<b>0.128</b>	0.06	2.02	0.04	0.00	0.25
Job Demands (0-25)	<b>-0.152</b>	0.02	-6.70	0.00	-0.20	-0.11
Demands <sup>2</sup> (0-25)	<b>0.004</b>	0.00	4.13	0.00	0.00	0.01
Job Control (0-25)	<b>0.110</b>	0.01	17.42	0.00	0.10	0.12
Social Support (0-25)	<b>0.005</b>	0.02	0.26	0.79	-0.04	0.05
Support <sup>2</sup> (0-25)	<b>0.005</b>	0.00	7.24	0.00	0.00	0.01
Discrimination Hi	<b>-0.329</b>	0.10	-3.35	0.00	-0.52	-0.14
ERI	<b>-0.180</b>	0.06	-3.26	0.00	-0.29	-0.07
Justice Low <sup>b</sup>	<b>-0.268</b>	0.06	-4.16	0.00	-0.39	-0.14
Justice Med. <sup>b</sup>	<b>-0.054</b>	0.06	-0.92	0.36	-0.17	0.06
Physical Env. (0-6)	<b>0.148</b>	0.03	4.71	0.00	0.09	0.21
Managers <sup>d</sup>	<b>0.031</b>	0.14	0.22	0.82	-0.24	0.30
Professionals <sup>d</sup>	<b>0.128</b>	0.10	1.24	0.22	-0.07	0.33
Technicians & ass. professionals <sup>d</sup>	<b>0.046</b>	0.10	0.45	0.65	-0.15	0.24
Clerks <sup>d</sup>	<b>0.217</b>	0.10	2.07	0.04	0.01	0.42
Service workers <sup>d</sup>	<b>0.308</b>	0.09	3.30	0.00	0.13	0.49
Agricultural and fishery <sup>d</sup>	<b>-0.139</b>	0.26	-0.53	0.60	-0.65	0.38
Craft and related trades <sup>d</sup>	<b>0.368</b>	0.11	3.49	0.00	0.16	0.57
Plant & machine ops. & assemblers <sup>d</sup>	<b>0.346</b>	0.11	3.16	0.00	0.13	0.56
Bismarckian <sup>e</sup>	<b>-0.568</b>	0.44	-1.30	0.20	-1.43	0.29
Anglo-Saxon <sup>e</sup>	<b>-0.619</b>	0.58	-1.06	0.29	-1.76	0.52
Southern <sup>e</sup>	<b>-0.967</b>	0.41	-2.37	0.02	-1.77	-0.17
Eastern <sup>e</sup>	<b>-1.608</b>	0.36	-4.47	0.00	-2.31	-0.90

Reference categories: a) Full Time Work b) Organizational Justice High c) Hiding Feelings Low  
d) Elementary Occupations e) Social Democratic Regimes f) Pacesetter Regimes

Table H: Complete results for model 6: Psychosocial, class and work. cond. regimes.

<b>Wellbeing</b>	<b>Coef.</b>	<b>SE</b>	<b>z</b>	<b>P&gt;z</b>	<b>[95%</b>	<b>CI]</b>
(Constant)	<b>18.309</b>	0.39	47.01	0.00	17.55	19.07
Somatic Health (0-10)	<b>-0.569</b>	0.03	-16.41	0.00	-0.64	-0.50
Somatic <sup>2</sup> (0-10)	<b>0.027</b>	0.01	4.95	0.00	0.02	0.04
Mental Health (0-4)	<b>-1.203</b>	0.03	-40.27	0.00	-1.26	-1.14
Women	<b>-0.188</b>	0.05	-3.52	0.00	-0.29	-0.08
Age	<b>-0.130</b>	0.01	-9.33	0.00	-0.16	-0.10
Age <sup>2</sup>	<b>0.001</b>	0.00	8.23	0.00	0.00	0.00
Part Time <sup>a</sup>	<b>-0.048</b>	0.07	-0.64	0.52	-0.19	0.10
Over Time <sup>a</sup>	<b>-0.295</b>	0.08	-3.49	0.00	-0.46	-0.13
Shift Work High	<b>0.127</b>	0.06	2.02	0.04	0.00	0.25
Job Demands (0-25)	<b>-0.152</b>	0.02	-6.68	0.00	-0.20	-0.11
Demands <sup>2</sup> (0-25)	<b>0.004</b>	0.00	4.15	0.00	0.00	0.01
Job Control (0-25)	<b>0.111</b>	0.01	17.52	0.00	0.10	0.12
Social Support (0-25)	<b>0.006</b>	0.02	0.28	0.78	-0.03	0.05
Support <sup>2</sup> (0-25)	<b>0.005</b>	0.00	7.19	0.00	0.00	0.01
Discrimination High	<b>-0.327</b>	0.10	-3.33	0.00	-0.52	-0.13
ERI	<b>-0.180</b>	0.06	-3.24	0.00	-0.29	-0.07
Justice Low <sup>b</sup>	<b>-0.273</b>	0.06	-4.24	0.00	-0.40	-0.15
Justice Med. <sup>b</sup>	<b>-0.056</b>	0.06	-0.97	0.33	-0.17	0.06
Physical Env. (0-6)	<b>0.146</b>	0.03	4.65	0.00	0.08	0.21
Managers <sup>d</sup>	<b>0.031</b>	0.14	0.22	0.82	-0.24	0.30
Professionals <sup>d</sup>	<b>0.121</b>	0.10	1.18	0.24	-0.08	0.32
Technicians & ass. professionals <sup>d</sup>	<b>0.042</b>	0.10	0.41	0.68	-0.16	0.24
Clerks <sup>d</sup>	<b>0.213</b>	0.10	2.03	0.04	0.01	0.42
Service workers <sup>d</sup>	<b>0.308</b>	0.09	3.30	0.00	0.13	0.49
Agricultural and fishery <sup>d</sup>	<b>-0.140</b>	0.26	-0.53	0.59	-0.65	0.37
Craft and related trades <sup>d</sup>	<b>0.364</b>	0.11	3.46	0.00	0.16	0.57
Plant & machine ops. & assemblers <sup>d</sup>	<b>0.344</b>	0.11	3.14	0.00	0.13	0.56
Pragmatists <sup>f</sup>	<b>-1.143</b>	0.25	-4.52	0.00	-1.64	-0.65
Conventionals <sup>f</sup>	<b>-2.356</b>	0.64	-3.68	0.00	-3.61	-1.10
Much Too Be Done <sup>f</sup>	<b>-1.346</b>	0.35	-3.79	0.00	-2.04	-0.65
Other <sup>f</sup>	<b>0.041</b>	0.33	0.13	0.90	-0.60	0.68

Reference categories: a) Full Time Work b) Organizational Justice High c) Hiding Feelings Low  
d) Elementary Occupations e) Social Democratic Regimes f) Pacesetter Regimes