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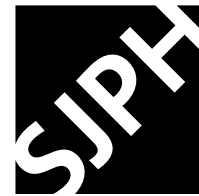
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ORIGINAL ARTICLE

Psychosocial work environment and its association with socioeconomic status. A comparison of Spain and Denmark

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Abstract

Aims: The purpose of this study was to describe psychosocial work environment inequalities among wage earners in Spain and Denmark. **Methods:** Data came from the Spanish COPSOQ (ISTAS 21) and the Danish COPSOQ II surveys both performed in 2004–05 and based on national representative samples of employees with a 60% response rate. Study population was 3,359 Danish and 6,685 Spanish women and men. Only identical items from both surveys were included to construct 18 psychosocial scales. Socioeconomic status was categorized according to the European Socioeconomic Classification System. Analysis included ordinal logistic regression and multiple correspondence analysis after categorizing all scales. **Results:** A relationship between socioeconomic status and psychosocial work environment in both Denmark and Spain was observed, with wider social inequalities in Spain for many scales, describing a strong interaction effect between socioeconomic status and country. **Conclusions:** Socioeconomic status is related to psychosocial work environment and some adverse psychosocial conditions tend to cluster in lower socioeconomic status groups in both Spain and Denmark. This effect could be modified by a country's characteristics, such as economic and labour market structures, normative regulations and industrial relations including work organization. Hence, preventive strategies to reduce social inequalities in working conditions should consider the combination of actions at the macro and micro levels.

Key Words: Denmark, inequalities, international COPSOQ, occupational exposures, occupational health, psychosocial factors, Spain

Background and aims

Psychosocial risk factors represent a field of increasing interest in occupational health, both for their impact on health and health inequalities and for the changes in the work environment that imply growing exposure to these risk factors. The focus on psychosocial risk factors also point towards new needs and priorities for research and prevention [1,2]. At the same time, reducing the gap in social inequalities in health has been set up as a priority action by the World Health Organization (WHO) and most European Union governments. This requires preventive strategies to be based on a comprehensive

understanding of the conditions determining hazardous exposures at workplaces.

Scientific evidence on social health inequalities is not limited to health consequences of general living conditions. Working conditions, especially the psychosocial work environment [3] have been found to account for some of the social gradients in mortality, mental well-being and sickness absence [4–7]. Overall, work stress measurements tend to be higher in lower socioeconomic status (SES) occupations [8], even when greater effort-reward imbalance may affect mostly higher SES jobs [9]. The lower SES occupations are more exposed to adverse

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psychosocial conditions [10], but some exceptions to this rule have been pointed out. While control over job and rewards tends to be lower among low SES occupations [11] the opposite figure has been documented regarding job demands [12].

Successive European Working Conditions Surveys show both inter and intra country social inequalities in psychosocial working conditions across the European Union. While Spanish workers appeared among the most exposed to psychosocial risks, an opposite figure has been shown for the Danish workforce [13,14].

Inequalities in the psychosocial work environment across SES groups have been documented both in Spain [15] and in Denmark [16]. An exploratory study reported that work environment in Denmark appeared to be more active, developmental and challenging than work environment in Spain while no differences were found regarding interpersonal relations and leadership [17]. These disparities in psychosocial exposures may be related to differences in several factors at macro and micro levels including economic and labour market structure, normative regulations and industrial relations, labour management practices and working conditions, and occupational health and well-being policies [18]. Denmark has gone further than Spain in the development of the welfare state and the promotion of healthier working conditions, including those related to work organization and labour management practices that constitute the core basis of psychosocial exposure in the workplace. However, the possible consequences of these differences have not been subject to more detailed comparative analysis. A good understanding of these relationships may help to identify key targets for preventive action [16,19]. The purpose of this study is to describe psychosocial work environment inequalities among wage earners in Spain and Denmark. We hypothesize that a SES gradient in psychosocial work environment will be found in both Denmark and Spain. We further hypothesize that the social gradient will be more pronounced in Spain compared with Denmark. This second hypothesis is, among other things, motivated by the fact that Denmark has much lower organizational power distance than Spain [20] and that research has shown wider health inequalities in late democracies (such as Spain) compared to countries with a long tradition of social democracy (such as Denmark) [21].

Methods

Data was taken from the Spanish COPSOQ (ISTAS 21) and the Danish COPSOQ II surveys, both

performed in 2004–05 and based on national representative samples of employees. Collected information included the psychosocial dimensions, socio-demographics, employment and working conditions' variables. Detailed description of the sampling and the study population for the two studies is included in, respectively, Llorens et al. and Pejtersen et al. (both in this issue).

The Spanish COPSOQ (ISTAS21) survey

The Spanish study used the Spanish version of COPSOQ I previously adapted from the original Danish and validated in Spain [22]. Information was obtained through the administration of the questionnaire by personal interview in the household. In all, 7,650 wage earners aged 16–65 answered the questionnaire (response rate 60%).

The Danish COPSOQ II survey

The Danish study used the second version of the COPSOQ [23] and respondents completed a mail-out-mail-back questionnaire or answered over the internet (used by 10% of respondents). In all, 3,517 wage earners aged 20–59 completed the questionnaire (response rate 60%).

The study sample

For the purpose of this paper we combined the two data sets. The SES categories were established according to the European Socio-Economic Classification system (ESEC) which is based on the ISCO88 occupational codes [24]. Fellow workers, farmer employees, Spanish *dependent self-employed*, individuals with missing ISCO88 codes and the ESEC "Lower Supervisors and Technicians" category, with a very low Danish frequency ($n = 13$) were excluded, so SES was finally characterized by six categories – Higher professionals and managers, Lower professionals and managers, Higher clerical, services and sales workers, Lower clerical, services and sales workers, Skilled workers, and Semi- and unskilled workers. The final sample consisted of 10,044 employees (3,359 Danish and 6,685 Spanish). The characteristics of the two samples with regard to gender, age, and socioeconomic status can be seen in Table I.

Measurements

Only identical items from Danish COPSOQ II and Spanish COPSOQ I (ISTAS 21) scales were included in the analysis. In order to validate the scales

Table I. Study population characteristics in Denmark ($n=3,359$) and Spain ($n=6,685$) by social class, sex and age group; 2005.

Study population characteristics	<i>n</i>	%
Social class – Denmark		
Higher professionals and managers	451	13.4
Lower professionals and managers	630	18.8
Higher clerical services and sales workers	750	22.3
Lower clerical services and sales workers	582	17.3
Skilled workers	345	10.3
Semi- and unskilled workers	601	17.9
Social class – Spain		
Higher professionals and managers	450	6.7
Lower professionals and managers	565	8.5
Higher clerical services and sales workers	1,203	18.0
Lower clerical services and sales workers	1,456	21.8
Skilled workers	1,028	15.4
Semi- and unskilled workers	1,983	29.7
Sex – Denmark		
Women	1,759	52.4
Men	1,600	47.6
Sex – Spain		
Women	3,305	49.6
Men	3,359	50.4
Age – Denmark		
<31	511	15.2
31–45	1,458	43.4
>45	1,390	41.4
Age – Spain		
<31	2,270	34.0
31–45	3,019	45.2
>45	1,384	20.7

translation, analysis of differential item functioning (DIF) [25] with respect to the exogenous variables country and SES was performed for all scales. Special attention was given to three scales that had been modified from the Danish COPSOQ to the Spanish context. Additional items were added to the Spanish scales of *Job insecurity* and *Influence* and one of the items in the scale of *Quantitative demands* was reversed and therefore had a negative formulation in Danish but a positive formulation in Spanish. DIF for an item required a significant association of sufficient magnitude between the item and the exogenous variable when controlling for the scale score. A sufficient magnitude for the association required that the exogenous variable explained at least an additional 4% of the item variance [26]. The analysis only showed DIF with respect to country for one of the items in the scale *Job insecurity*. The scale was therefore divided into two – *Insecurity*, with two items and *Concerns about employability*, with one item. So, a final set of 18 multi-item psychosocial scales that were comparable between the two countries was established (see Table II). The scales were scored on a 0–100 metric.

Analysis

Analysis was performed in two phases. In the first phase, the scale score for each scale was categorized into five categories with approximately equal number of respondents in each category. This was done because many of the reduced scales had floor or ceiling effects which could bias results from standard linear regression. We used ordinal logistic regression analysis for all categorized scales, with the main objective of evaluating the interaction between country and SES. The categorized scale was used as the dependent variable, while country, SES and an interaction between SES and country were used as independent variables. Furthermore, the analyses were adjusted for sex, age and interactions between: sex and country, sex and SES, age and country and age and SES. The odds ratio was the odds of being in a higher category for each of the COPSOQ scales. For the independent variables we chose the grand mean as the reference as we did not have natural reference categories for the SES variables. Supplementary analyses were made separately for each country.

Ordinal logistic regression assumes proportional odds, which implies that the analyses in principle should give the same results as analysis of dichotomized scales (although the analysis of dichotomized scales would be less robust and have less power). To test this assumption, we performed a parallel analysis using dichotomized scales and compared results. Since the results were similar, we only report results from the ordinal logistic regression.

In a second multivariate phase we conducted multiple correspondence analysis to study the descriptive relationship among all psychosocial scales with SES, sex and country categories in order to obtain a view based in a multivariate framework. We dichotomized each of the 18 psychosocial scales into two categories (below or above the median of the Danish males) and labelled them as “good psychosocial work environment” and “poor psychosocial work environment” according to the hypotheses of the developer of the COPSOQ [27]. The quantification of inertia was performed by means of the Greenacre’s adjustment [28].

Results

When controlling for socioeconomic status in the ordinal logistic regression analyses, the gender differences were generally small, except for the following differences: men indicated more cognitive demands than women (odds ratio (OR) = 1.29), higher influence (OR = 1.32), more possibilities for development

Table II. COPSQ scales and items included in the analysis.

COPSQ dimensions & items	Number of items	Cronbach's alpha
<i>Work pace</i>	1	–
Do you have to work very fast?		
<i>Quantitative demands</i>	3	0.65
Is your workload unevenly distributed so it piles up?		
How often do you not have time to complete all your work tasks?		
Do you have enough time for your work tasks?		
<i>Cognitive demands</i>	3	0.65
Does your work require that you remember a lot of things?		
Does your work require you to make difficult decisions?		
<i>Emotional demands</i>	3	0.87
Does your work put you in emotionally disturbing situations?		
Is your work emotionally demanding?		
Do you get emotionally involved in your work?		
<i>Demands for hiding emotions</i>	1	–
Does your work require that you hide your feelings?		
<i>Influence at work</i>	3	0.78
Do you have a large degree of influence concerning your work?		
Can you influence the amount of work assigned to you?		
Do you have any influence on what you do at work?		
<i>Possibilities for development</i>	3	0.84
Does your work require you to take the initiative?		
Do you have the possibility of learning new things through your work?		
Can you use your skills or expertise in your work?		
<i>Meaning of work</i>	3	0.72
Is your work meaningful?		
Do you feel that the work you do is important?		
Do you feel motivated and involved in your work?		
<i>Commitment to the workplace</i>	2	0.74
Do you enjoy telling others about your place of work?		
Do you feel that your place of work is of great importance to you?		
<i>Predictability</i>	2	0.83
At your place of work, are you informed well in advance concerning for example important decisions, changes, or plans for the future?		
Do you receive all the information you need in order to do your work well?		
<i>Role-clarity</i>	3	0.79
Does your work have clear objectives?		
Do you know exactly which areas are your responsibility?		
Do you know exactly what is expected of you at work?		
<i>Role-conflicts</i>	4	0.86
Do you do things at work that are accepted by some people but not by others?		
Are contradictory demands placed on you at work?		
Do you sometimes have to do things that ought to have been done in a different way?		
Do you sometimes have to do things that seem to be unnecessary?		
<i>Quality of leadership</i>	3	0.82
To what extent would you say that your immediate superior . . .		
– makes sure that the individual member of staff has good development opportunities?		
– is good at work planning?		
– is good at solving conflicts?		
<i>Social support from colleagues</i>	2	0.81
How often do you get help and support from your colleagues?		
How often are your colleagues willing to listen to your problems at work?		
<i>Social support from supervisors</i>	2	0.82
How often do you get help and support from your nearest superior?		
How often is your nearest superior willing to listen to your problems at work?		

(continued)

Table II. Continued.

COPSOQ dimensions & items	Number of items	Cronbach's alpha
<i>Sense of community</i>	3	0.89
Is there a good atmosphere between you and your colleagues?		
Is there good co-operation between the colleagues at work?		
Do you feel part of a community at your place of work?		
<i>Insecurity at work</i>	2	0.80
Are you worried about being transferred to another job against your will?		
Are you worried about becoming unemployed?		
<i>Concerns about employability</i>	1	–
Are you worried about it being difficult for you to find another job if you became unemployed?		

(OR = 1.24) and lower concerns about employability (OR = 0.84). Since no significant gender*country interactions were found, the results refer to the common trend in Denmark and Spain (not shown in tables). Trends with age were also fairly small, except for the following differences that all showed a clear trend across age groups: compared to the youngest group (18–30 years), the older employees (46–59 years) reported more cognitive demands (OR = 1.31), more emotional demands (OR = 1.43), higher degree of influence (OR = 1.59), higher meaning of work (OR = 1.39), more commitment to the workplace (1.35), higher role clarity (OR = 1.29), but less support from colleagues (OR = 0.79). No age group*country interactions were found (results not shown in tables). As shown in Table III, statistically significant differences in odds ratios between countries were seen for all scales except *Emotional demands* (Table III). Denmark had higher demands (*Quantitative demands*, *Work pace* and *Cognitive demands*). Furthermore, Denmark had better psychosocial work environment in terms of higher job control (*Influence*, *Possibilities for development*) and higher *Commitment to the workplace* than Spain. Also, Denmark had lower *Job insecurity* and *Concern about employability* than Spain. Spain had a better psychosocial work environment than Denmark with regards to social relations, higher *Predictability*, *Role clarity*, *Quality of leadership*, better *Support from colleagues* and lower *Role conflict*. The explained variance for country ranged from 1.0% to 10.0% for these scales.

For both countries, statistically significant SES differences in odds ratios were seen for most scales, and were most notable for *Cognitive demands*, *Emotional demands*, *Influence at work*, *Possibilities for development*, *Meaning of work* and *Commitment to the work place*. The explained variance for SES ranged from 4.5% to 10.9% for these scales. However, not all scales showed a clear trend consistent with the standard rank order of SES groups. Thus, in both countries work pace was greater for higher

professionals and managers and for semi- and unskilled workers compared to the neighbour categories. The opposite picture was seen for social support from colleagues, which was comparatively low for these two groups. Also, while job insecurity was high for semi- and unskilled workers in both countries, the pattern for other SES groups varied between countries.

Highly statistically significant differences in the social gradient between countries (i.e. SES*country interactions) were seen for 13 out of 18 scales (the exceptions were: *Commitment to the workplace*, *Predictability*, *Role conflicts*, *Quality of leadership*, *Social support from colleagues*, and *Job Insecurity*). The explained variance for the interaction effect ranged from 0.2% to 1.7% for these scales. In Table III, these SES*country interactions are indicated by the country specific ORs for SES. These ORs are the combination of the socioeconomic status main effect and the SES*country interaction.

For many scales, inequalities were more pronounced for Spain than for Denmark as witnessed by the stronger gradient in the odds for SES in Spain. This was in particular the case for *Cognitive demands*, *Influence at work*, *Possibilities for Development*, *Meaning of work*, *Social support from supervisors*, and *Social community at work*. In some cases, the SES*country interactions nullified the SES trend. Thus, in separate analyses by country, no significant SES differences were found for Denmark for the scales: *Work pace*, *Role clarity*, *Role conflicts*, *Social support from supervisors*, and *Social community at work* (data not shown).

For Denmark, more pronounced socioeconomic status differences were found for *Quantitative demands* in particular, with the highest socioeconomic status having the highest *Quantitative demands*. While separate analyses for Spain showed significant differences with SES, the trend was not clear, with the highest *Quantitative demands* found for skilled workers and the lowest found for lower professionals and managers.

Table III. Odds ratio for higher category in each COPSOQ scale (categorized in five categories). All analyses controlled for age, gender and all bivariate interactions.

Effect	Country	Demands for					Possibilities for			Commitment to the Workplace ^b			Social Support from Supervisors ^b Colleagues ^b at Work ^b			Concerns about Employability			
		Quantitative Demands	Work Pace Demands	Cognitive Demands	Emotional Demands	Hiding Emotions	Influence ^b	Develop-ment ^b	Meaning of Work ^b	Workplace ^b	Predicta-bility ^b	Role Clarity ^b	Conflic-tors Leadership ^b	Quality of Leadership ^b	Support from Supervisors ^b	Support from Colleagues ^b	Community at Work ^b	Job Insecurity	Employ-ability
	Denmark (DK)	1.38	1.49	1.65	0.97	0.79	1.12	1.26	0.88	1.08	0.65	0.69	1.19	0.68	1.09	0.75	1.11	0.54	0.77
	Spain (ESP)	0.73	0.67	0.61	1.03	1.26	0.89	0.79	1.13	0.93	1.55	1.44	0.84	1.47	0.91	1.34	0.90	1.84	1.30
	DK																		
	Higher professionals & managers	1.93	1.18	1.88	1.05	1.10	1.52	1.61	1.23	1.41	1.35	0.88	1.02	1.21	1.01	0.95	0.92	0.97	0.93
	Lower professionals & managers	1.35	0.94	1.42	1.76	1.26	1.36	1.80	1.18	1.31	1.09	0.95	0.97	1.10	0.94	1.14	0.86	0.81	0.67
	Higher clerical, services & sales	1.47	1.01	1.34	1.17	1.04	1.22	1.08	1.11	1.25	1.15	0.99	1.00	1.14	1.11	1.04	1.04	1.07	1.22
	Lower clerical, services & sales	0.71	0.85	1.08	1.74	1.69	1.01	0.94	1.17	0.96	0.96	1.11	1.16	1.13	1.10	1.15	1.10	0.90	0.83
	Skilled workers	0.65	0.98	0.60	0.48	0.62	0.63	0.78	0.76	0.66	0.71	0.95	0.86	0.69	0.88	1.08	1.15	0.99	1.02
	Semi- & unskilled workers	0.57	1.08	0.43	0.56	0.66	0.63	0.44	0.69	0.68	0.87	1.15	1.02	0.84	0.97	0.72	0.97	1.34	1.54
	ESP																		
	Higher professionals & managers	1.12	1.09	2.53	1.59	1.37	2.24	2.21	2.19	1.88	1.41	1.11	1.23	1.51	1.43	1.18	1.32	1.14	0.97
	Lower professionals & managers	0.75	0.80	2.15	1.58	1.32	2.00	3.23	2.72	1.70	1.46	1.70	0.88	1.36	1.41	1.42	1.39	0.67	0.75
	Higher clerical, services & sales	1.14	0.82	0.95	0.99	0.92	1.11	1.10	0.95	1.12	0.97	0.93	1.06	1.04	1.16	1.12	1.13	1.09	0.96
	Lower clerical, services & sales	0.87	0.88	0.68	0.93	1.14	0.66	0.58	0.61	0.79	0.88	0.80	0.93	0.93	0.93	0.99	0.92	1.14	1.09
	Skilled workers	1.16	1.21	0.65	0.73	0.74	0.71	0.68	0.70	0.70	0.82	0.83	0.94	0.77	0.76	0.85	0.83	0.93	1.10
	Semi- & unskilled workers	1.04	1.32	0.43	0.60	0.71	0.43	0.33	0.41	0.51	0.69	0.87	0.99	0.65	0.60	0.63	0.63	1.14	1.19
	Significance of country	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
	Variance explained by country ^a	3.3%	3.8%	10.0%	1.7%	1.0%	1.6%	3.9%	0.2%	1.0%	3.8%	3.2%	1.0%	3.0%	0.8%	2.4%	0.7%	9.8%	2.6%
	Significance of SES	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
	Variance explained by SES ^a	1.6%	1.1%	7.3%	4.5%	2.4%	6.3%	10.9%	5.7%	4.6%	1.7%	0.6%	0.3%	1.8%	2.0%	2.0%	1.0%	0.8%	1.5%
	Significance of SES*country	***	***	***	***	***	***	***	***	***	**	***	***	**	***	**	***	*	***
	Variance expl. by SES*country ^a	1.3%	0.2%	0.5%	0.7%	0.2%	0.6%	0.7%	1.7%	0.3%	0.2%	0.6%	0.1%	0.2%	0.5%	0.2%	0.7%	0.1%	0.3%

All parameter estimates concern comparison to the grand mean. For comparisons between countries, the total effect of the psychosocial work environment for a specific job group in one of the two countries is calculated from the combined effect of country, and the country specific SES ORs. For instance, the total effect of *Cognitive demands* for Higher professionals & managers is calculated as 1.88*1.65 = 3.10 for Denmark and as 2.53*0.61 = 1.54 for Spain.
^a $p < 0.05$, ^{**} $p < 0.01$, ^{***} $p < 0.001$.
^bHigh scale values are considered to have a positive effect on health [23].

Figures 1 and 2 show the three factors described by correspondence analyses. In the graphs, axes are described by psychosocial categories. The closer they are to the extreme of the axes the more they contribute to explain them. Distance among categories refers to the relationship among them – the closer they are, the stronger the association among them is. Factor 1 was described by the dimensions of *Meaning of work (mw)*, *Social support from supervisors (sss)*, *Quality of Leadership (ql)*, *Possibilities for development (pd)*, *Predictability (pre)*, *Social community at work (scw)*, *Commitment to the workplace (cw)*, *Role clarity (rc)*, *Social support from colleagues (ssc)*. Factor 2 by *Emotional demands (ed)*, *Role conflict (rco)*, *Demands for hiring emotions (dhe)*, *Quantitative demands (qd)*, *Cognitive demands (cd)*, *Work pace (wp)*, *Commitment to the workplace (cw)*, and *Influence (inf)*. These two factors explained 84.1% of variability. An additional 4% of variability was explained by a third factor described by *Job Insecurity (ins)* and *Concerns about employability (emp)*.

Categories' distribution showed a general relationship of psychosocial dimensions with SES.

Differences were more evident for Spain. Lines connecting ESEC groups were straighter and longer in Spain, while the Danish results showed more central positions and crossovers of group 1, 2, 3 and 7. In Spain, ESEC 1 and 2 were closer to good psychosocial categories, while ESEC 7, 8 and 9 were closer to the poor, with ESEC 3 with more intermediate position but closer to lower ESEC. In Denmark, ESEC 1, 2, 3 and 7 were closer to good categories psychosocially; while ESEC 8 and 9 were closer to the poor. Danish ESEC 8 and 2 and Spanish 9 were the groups with highest gender differences.

The third factor (Figure 2) defined by *Job insecurity (ins)* and *Concerns about employability (emp)* clearly discriminated both countries.

Discussion

This is an international population-based comparative study that used the same validated instrument [22,23] in two countries to collect information during the same time period. Both studies were

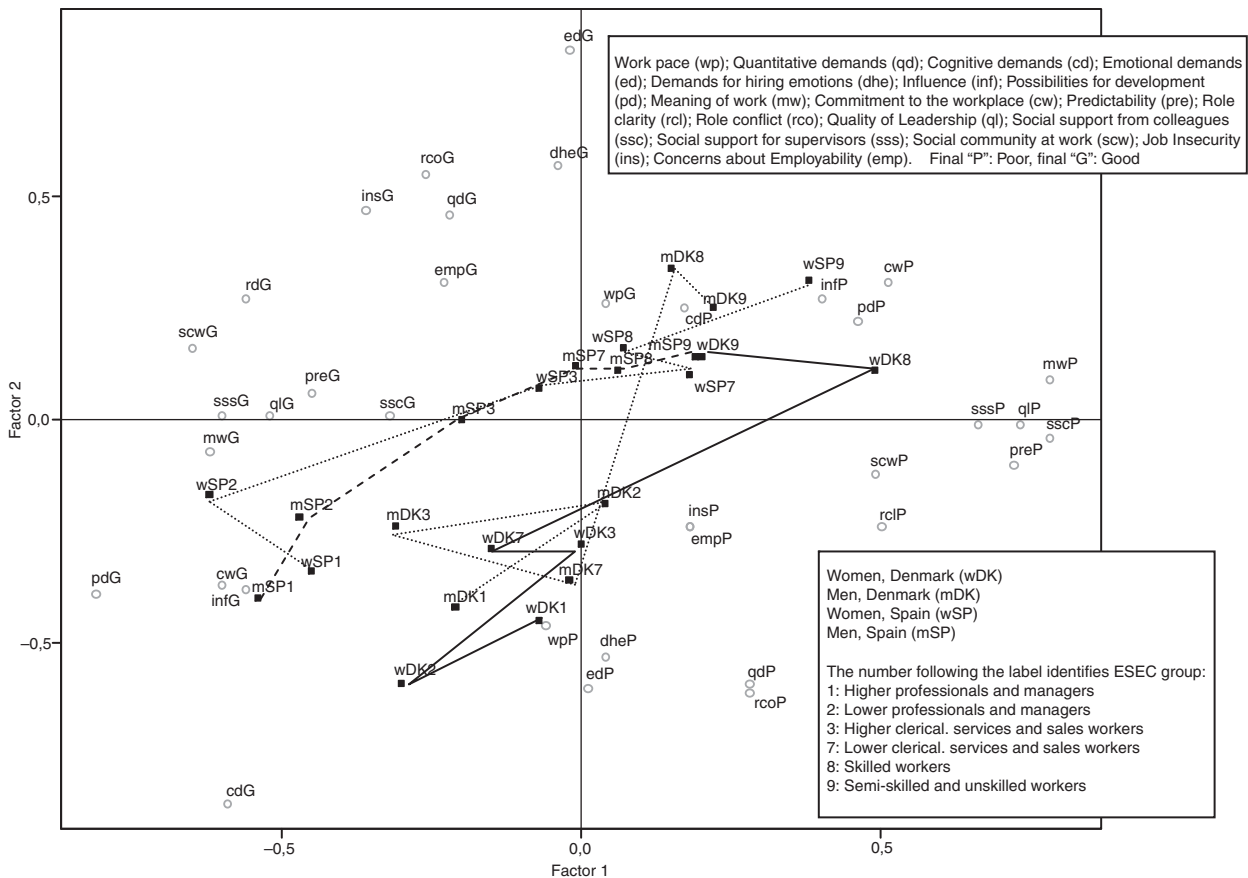


Figure 1. Psychosocial work environment and ESEC relationship by country and sex. Factors 1 & 2. Male and female employees, Denmark and Spain (n = 10,044), 2005.

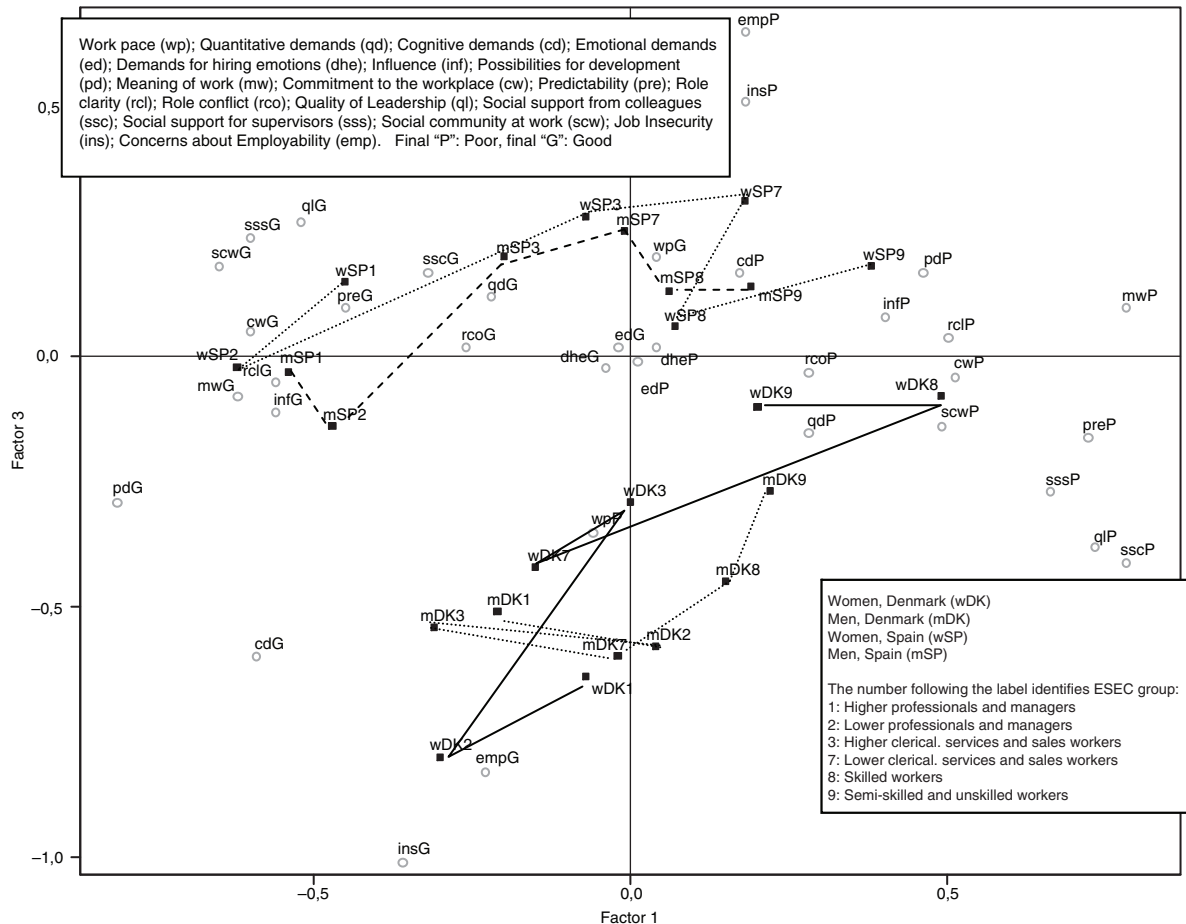


Figure 2. Psychosocial work environment and ESEC relationship by country and sex. Factors 1 & 3. Male and female employees, Denmark and Spain ($n=10,044$), 2005.

representative national samples, inclusion criteria were similar, and socioeconomic status was classified with an internationally comparable system – ESEC [24]. Only identical items were included in the analysis. This may constitute the main strengths of this article.

For most scales, we found a relationship between SES and psychosocial work environment in both Denmark and Spain. The picture is complex and there is not always a clear trend in working conditions across SES groups. However, many scales showed a pattern of wider social inequalities in Spain while only a few scales (most notably Quantitative demands) showed the opposite picture. The correspondence analysis showed that 84% of the variability could be explained by two factors. SES differences were more clear in Spain, in particular with regards to the first factor, which covered the domains of meaning, supervisor support, quality of leadership, development possibilities, predictability, social community, commitment to the workplace, role clarity, and support from colleagues. A social gradient

(although less clear) could also be seen in Denmark, in particular for the second factor, which covered the domains of quantitative, cognitive, emotional, and hiring emotions demands; work pace; role conflicts; commitment to the workplace; and influence.

These results are consistent with other findings which show that poor psychosocial working conditions tended to cluster in lower SES occupations despite higher psychological demands and higher effort maybe characterizing the upper SES groups [3,10–12]. However, not all psychosocial dimensions showed the same relationship with SES and we did not find identical social gradients in both countries.

Our results showed a strong interaction effect between SES and country for many scales, which may suggest that some differences in economic and labour market structure, normative regulations and industrial relations between Spain and Denmark could partially explain this relationship. As a WHO recent report on employment conditions pointed out, the Danish labour market is more egalitarian than the Spanish one [18].

It has been remarked that work organization in Spain is mainly based on Tayloristic principles [29,30], and that Denmark and Spain differ in several ways regarding organizational culture [20]. Denmark had the second lowest organizational power distance among European countries, whereas Spain together with France, Belgium, Portugal and Greece had the highest power distance. Thus, Taylorism-based [31] and hierarchical organizational cultures lead to decreased influence and possibilities for development among lower status employees. In contrast, collective direct participation formulas can improve psychosocial work environment by increasing job complexity (skill discretion) and autonomy (decision latitude), as long as it is recognized (rewarded) in terms of wage and accepted by workers. These are fundamental features of the Danish labour market, secured by collective agreements and legislation as a mean to achieve employees' well-being at worksite [32] (as elsewhere in Scandinavia) [33,34] on the basis of a long tradition of employee involvement in terms of information and consensus-based decision-making [35–37]. Furthermore, Denmark has high union density, a high degree of collective agreements, and formalized systems for employee influence [38–39].

Nevertheless, this active work organization can also have its flaws. It can be characterized by project – management or objectives management, which may involve higher uncertainty (fluid work division: flattening hierarchies without sufficient distribution of responsibilities and information, new responsibilities and goals, no rules to restrict demands: new tasks, new products, with strict deadlines) and individualization (individual performance measurement, procedures that restrict working together), which may involve “*chaotic differentiation*” and could explain the higher *Quantitative demands, Work pace, Cognitive demands*, and lower *Role clarity, Predictability* and *Support from colleagues* in Danish work settings compared to Spanish ones [40].

Inter-country differences on *Job insecurity* and *Concerns about employability* are other striking results. The high Spanish scores on *Job insecurity* and *Concerns about employability* could have many explanations. Denmark has a low legal protection for workers being fired, but high compensation rates for unemployment. On the other hand Spain has high legal protection but low compensation. Denmark has had, since the late 1990s and up to the study period, very low unemployment, high turnover rates and a high labour force participation rate – whereas Spain has had high unemployment, low turnover rates, and a low labour force participation rate [41]. The combination of low legal protection, high

compensation, high turnover rates, and a highly active labour market policy in Denmark has been labelled “flexicurity” [42,43].

The ideology and practice of a neo-Darwinian global economy based in volatile financial markets rationality makes work life more insecure all over the world, but if competitiveness in a country is based on low workforce costs the consequences may be even worse. In the global division of labour, Spain is on the execution side and Denmark on the design side. This is evidenced by differences in the gross domestic expenditure on research and development (Spain: 1.12% of GDP as opposed to Denmark: 2.44% of GDP, in 2005); in employment in knowledge-intensive services (27% of employment in Spain and 43.8% in Denmark in 2006) [44] and in the trends in development of unskilled jobs, which is growing in Spain, in spite of the growth in educational level of workers, but decreasing in Denmark [45]. Training and promotion of employment policies are following a high-skill, high-added-value strategy in the Nordic countries. In contrast, Spanish companies look for comparative advantages based on lower cost in the short term. Spanish lack of investment in productive work organization and labour management at mid-term was promoted by government labour reforms during the 1990s, when working conditions suffered a deregulation process that empowered employers to demand more flexibility from workers [46]. This development took place despite the expansion of public education and lifelong training negotiated between Spanish employers' organization and trade unions and supported by the state and EU [46]. Outsourcing or transferring production or service to other countries is easy for transnational and national companies in Spain, as production is based on cost reduction and unskilled labour. The unemployment threat is therefore experienced as real. Unemployment rates are much higher in Spain (9.2%) than in Denmark (4.8%) and the use of temporary contracts (without rights in case of dismissal) is massive compared with Denmark [45]. For these reasons, fear of losing employment and fear of degradation of working conditions are at the centre of working life for everybody in Spain [47].

Although using different designs, measures and explanations we see our results as being in general agreement with the results by Hofstede on cultural differences between countries [20]. Compared with Spain, Denmark has less power distance, less uncertainty avoidance, somewhat more individualism, and less masculinity.

In light of such diverse differences in economic and labour market structure, policies and culture between Spain and Denmark, the smaller Danish SES

differences on many aspects of the psychosocial working environment seem logical. Furthermore, these results on psychosocial work environment inequalities are consistent with other research that found wider health inequalities in “Late democracy” (that includes Spain) than “Social democracy” (that includes Denmark) political tradition countries [21].

The study had some limitations. The Spanish study used personal interview in the household whereas the Danish study used a mail questionnaire. Respondents in telephone questionnaires and face to face administered questionnaires generally report better health and well-being than respondents in mail administered questionnaires [48–50]. Such a methods effect could partly explain why Spain had better scores than Denmark on nine scales, but would not explain why Denmark had better scores on the remaining nine scales. We would not expect such a methods effect to have an impact on the SES differences nor on the SES*country interactions. Also, differences between countries may be due to national differences in response styles or simply to drift in “difficulty” of an item when it is translated. Again, this may impact the difference between countries, but is unlikely to impact the SES differences or the SES*country interactions. Both studies had a 60% response rate, which is usual in such studies. Comparison of the Spanish study population with the employee population of the Spanish National Active Population Survey (*EPA*) was done for the same period of time and no evidence of bias was observed except for an excess of 8% of women from the retail sector working a split shift, probably due to differences in sampling strategies of both surveys – we used information from respondents exclusively, while *EPA* included next of kin information, and reported that it is more likely to find split shift employed women at home than men [22,51]. A previous analysis of response rates in the Danish study found that the response rate was higher for women and increased with age [27]. No difference in response rate was found for urbanization. We did not have any information on response rate in relation to SES. Thus, we cannot completely rule out the possibility that differential non-response with respect to SES and work factors might bias the social gradient. We found that Denmark had a higher percentage of workers in the higher SES groups whereas Spain had a higher percentage in the lower groups. However, this is likely a true difference, since it has been replicated in other studies [33,52]. A higher percentage of the workers in Spain are employed in agriculture, construction, wholesale and retail trade and hotels and restaurants than in Denmark.

In Denmark a higher proportion are employed in the health sector, education and transport and communication [45].

Since SES is the central variable in our analyses, the validity of the ESEC classification in both Denmark and Spain is crucial for the interpretation of results. Kunst et al. [52] found that the ESEC classification showed differences in self-rated health by SES group, but the gradient was less clear in Spain than in Denmark. Since Kunst et al. used data from 1994, we repeated their analysis with our data, which included wage earners but not farmers or self-employed people, as in Kunst et al. We found that the ESEC classification system was more appropriate for Spain in 2004–2005. Thus, 99.6% of Spanish women could be classified according to ESEC in our study as compared to 59.4% in the previous study. We also found a SES gradient for self-rated health in both Denmark and Spain, although the gradient was stronger in Denmark. While we cannot completely rule out the possibility of cross-cultural differences in the applicability of the ESEC classification, our results support the relevance of ESEC for both Denmark and Spain.

The Spanish translation process for the COPSOQ followed standard translation and adaptation procedures – including back-translation process and pilot testing [20]. Therefore, we assume a possible bias due to translation to be minor and more likely to affect the country level rather than the SES gradient within each country.

In conclusion, we found an SES gradient in the psychosocial work environment so that many poor psychosocial conditions clustered in lower SES occupations in both Spain and Denmark, with social inequalities being wider in Spain for many scales. This effect could reflect characteristics of the countries such as economic and labour market structures, normative regulations and industrial relations including work organization. Preventive strategies to reduce social inequalities in working conditions should consider the combination of actions at these macro and micro levels.

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Conflict of interest

There is no conflict of interest.

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