

## **Longitudinal psychosocial assessment of office workers in a utility company**

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**Abstract.** A voluntary psychosocial assessment of office workers in a utility company was carried out using the short version of the Copenhagen Psychosocial Questionnaire (CoPsoQ) in two occasions, one and a half year apart. Initially, 25 workers participated (11 men and 14 women), while 14 of those workers (8 women and 6 men) participated in the second psychosocial assessment. Statistical analysis showed a fairly stable outlook longitudinally, with sustained severe scores in many of the sub-scales. An odds ratios analysis considering gender as exposure factor showed an effect on intensification of severity of workers control over work and esteem for men.

**Keywords.** Administrative work, Macroergonomics, Gender bias, Pshycho-social factor severity.

### **Introduction**

A psychosocial assessment was carried out in the office of the headquarters of a utility company based in Portugal in two different occasions, one year and a half apart. There were minor changes in the workforce from one assessment to the next one, however only workers that participated in both psychosocial assessments are included in the second sample. Parts of the first assessment have previously been reported in Tavares, Lima and Coelho (2013) and in Coelho, Tavares and Lourenço (2014). Longitudinal comparison of the individual scores is meant to assess if an intensification of dissatisfaction took place during the time between assessments. Psychosocial factors were assessed using the short version of the COPSQ – Copenhagen Psychosocial Questionnaire. This instrument surveys the following six major groups of psychosocial factors: the psychological demands of work (concerned with the volume of work in relation to the time available and management of emotions), workers control over work (concerning the opportunities that the job provides for active, meaningful work, that contributes to develop the individual's skills), insecurity towards the future (concerning worries about the future in terms of job loss or unwanted changes in work conditions), social support and leadership quality (concerning relationships with co-workers and superiors), conflicting demands (in relation to the need to compromise between time and tasks for work, family and socialization), and, finally, esteem (concerning respect, rewards and justice experienced in exchange for the work

Moreover, a macroergonomics perspective is introduced in the discussion articulating complex relationships at organizational and socio-economic levels (Coelho et al., 2012) that may provide a tentative and exploratory background explanation of the changes in psychosocial assessment detected over time. The paper concludes with a small discussion on the limitations of the study and directions for future research.

## 1. Methods

### 1.1 Psychosocial assessment

A group of researchers from the National Institute of Labor Health in Denmark, led by Professor Tage S. Kristensen, developed an instrument to assess psychosocial risks. This instrument was named Copenhagen Psychosocial Questionnaire - CoPsoQ and was later adapted by the Spanish state by a working group of the Institute of Labor Union, Environment and Health (ISTAS) (Moncada et al., 2005).

There are three versions of the questionnaire. The short version was developed for risk assessment of small businesses; the medium version was developed for risk assessment in medium to large companies; finally, the long version was designed for research and instrument development purposes. Given the size of the pool of workers available, and the voluntary nature of the assessment, the short version of the CoPsoQ was selected for use in the first assessment, a selection which was maintained in the second assessment, to enable the longitudinal analysis sought.

In this study, the ISTAS 21 (CoPsoQ) - short version was used, since this questionnaire is quickly answered and simple to perform and analyze. At the onset of the study, the Spanish short version of the COPSOQ – Copenhagen Psychosocial Questionnaire (Moncada et al., 2005), was translated in to Portuguese by the first author, as at the time of instrument selection, a Portuguese version was not finalized and was not publicly and freely available. This version was developed to identify and measure exposure to six major groups of risk factors for psychosocial health at work. Moreover, the assessment of severity of each of the sub-scales is based on the level of scores attained. Based on this attribution, the sub-scales for which a higher score means greater severity were considered as direct psychosocial risk factor scales, e.g. dissatisfaction scales, while the sub-scales for which a lower score means greater severity of the psychosocial risk factor, were considered as inverse psychosocial risk factor scales, e.g. satisfaction sub-scales (Lima & Coelho, forthcoming). This hence yielded three dissatisfaction sub-scales (psychological demands, insecurity towards the future, conflicting demands) and three satisfaction sub-scales (workers control over work, social support and leadership quality, esteem).

### 1.2 Participating subjects

Workers participated voluntarily in the psychosocial assessment, administered by the first author of this paper. In the first assessment, 25 workers participated (11 men and 14 women), while only 14 workers (8 women and 6 men) participated in the most recent psychosocial assessment reported in this paper, all of whom had already participated in the first assessment. Minor changes took place in the workforce from one assessment to the next one, however, only workers that participated in both psychosocial assessments were included in the second sample, for the purpose of the longitudinal perspective reported in this study.

### 1.3 Methods of analysis

The analysis consisted of longitudinal comparison of distributions of psychosocial ratings overall, and within genders, as well as an analysis of odds ratios, taking gender as the exposure factor, and using the condition of a severe score in the psychosocial sub-scales as the variables of interest. These analyses were performed with the assistance of the IBM SPSS Statistics 20 package. The two major sets of analyses carried out, resorted to non-parametric statistics, following the approach described in Coelho et al. (2013).

First, the independent samples median test was performed across categories of gender for each one of the distributions of psychosocial sub-scales assessed, for the 2012 results and for the 2013 results. Then, the related samples Wilcoxon sign ranked test was applied to the distributions of six psychosocial sub-scale scores across the two assessments made by the workers, to test the null hypothesis stating that the median of the differences between individual psychosocial scores in the two assessments equaled 0, for the double assessment participating subjects. Next, the individual results were coded according to the increase of severity of the results, between increasingly severe and not increasingly severe, in accordance to ISTAS 21 guidelines (Moncada et al., 2005). An odds ratios analysis was then carried out to investigate whether being female was a determinant factor for the risk of obtaining increasingly severe ratings in the psychosocial sub-scales in the second assessment, compared to the first one.

## 2. Results

### 2.1 Office under study

The office studied was located in the ground-floor of a recently built multi-storey building of concrete structure in a Portuguese district capital city and provided administrative and financial services to the company's field operations, as well as service to its utility customers. As a utility company, customer service is an important aspect of the operation, and consumes part of the 32 workers' attention. The other major activity was maintenance and coordination of the development of the field infrastructure as well as dispatching field maintenance and picket teams, and generating and handling bills and delayed payments. Moreover, the office also dealt with all the company's management systems (quality, environmental, occupational health and safety). The company had another 82 workers, who worked in the field, either permanently in field stations, or as part of dispatch teams. The office workers labored from 9am to 6pm on week days only. Fifteen men and seventeen women, permanent administration workers in the office under focus, were invited to voluntarily participate in the study. 25 of these accepted to participate in the first psychosocial assessment (11 men and 14 women), and then later on, only 14 of those were available and voluntarily participated in the second assessment (8 women and 6 men).

### 2.2 Results of the psychosocial assessment

The results obtained for the two assessment occasions, reported by sub-scale, are

CoPsoQ sub-scale	May 2012 (n=25)		November 2013 (n=14)	
	Mean	Stand. Dev.	Mean	Stand. Dev.
Psychological demands	<b>12.44</b>	2.77	<b>12.50</b>	3.96
Insecurity towards the future	8.12	2.99	8.71	4.01
Conflicting demands	<b>8.57</b>	2.80	<b>8.27</b>	4.34
Workers control over work	25.88	4.76	23.07	5.20
Social support and leadership quality	27.28	6.96	26.07	9.96
Esteem	<b>7.76</b>	4.01	<b>7.36</b>	3.80

shown in Tabular format. Table 1 depicts the results obtained for the two related samples, including both women and men in them.

*Table 1: Results for the first and second assessment, considering all participating subjects, severe mean results are underlined, according to Moncada et al. (2005).*

Table 2 shows the results in the same manner, but considering only the female subjects in each one of the two related samples. Finally, Table 3 depicts the results of psychosocial assessment obtained for the two related samples considering only male subjects in each one of the two related samples.

*Table 2: Results for the first and second assessment, considering only female subjects, obtained in each of the six psychosocial sub-scales - severe mean results are underlined, according to Moncada et al. (2005).*

CoPsoQ sub-scale	May 2012 (n=14)		November 2013 (n=8)	
	Mean	Stand. Dev.	Mean	Stand. Dev.
Psychological demands	<u>11.71</u>	3.12	<u>13.63</u>	2.61
Insecurity towards the future	7.57	2.24	8.25	3.58
Conflicting demands	<u>9.75</u>	2.01	<u>11.17</u>	2.64
Workers control over work	24.57	3.57	23.75	4.98
Social support and leadership quality	24.50	5.79	24.63	7.13
Esteem	<u>6.29</u>	3.65	<u>6.88</u>	2.53

*Table 3: Results for the first and second assessment, considering only male subjects, obtained in each of the six psychosocial sub-scales - severe mean results are underlined, according to Moncada et al. (2005).*

CoPsoQ sub-scale	May 2012 (n=11)		November 2013 (n=6)	
	Mean	Stand. Dev.	Mean	Stand. Dev.
Psychological demands	<u>13.36</u>	2.01	11.00	5.14
Insecurity towards the future	8.82	3.74	9.33	4.80
Conflicting demands	<u>7.00</u>	3.04	4.80	3.27
Workers control over work	27.55	5.59	22.17	5.81
Social support and leadership quality	30.82	6.94	28.00	13.39
Esteem	9.64	3.80	<u>8.00</u>	5.25

### 2.3 Comparisons across genders within each assessment occasion

The independent samples median test led to reject the null hypothesis consisting of “the medians of the psychosocial sub-scale scores are the same across the two categories of gender” in three cases (two pertaining to the first assessment, and one to the second one). The scores for 'workers control over work' were less favorable for women than for men in the 2012 assessment ( $p=0.049$ ). The scores for 'conflicting demands' were more unfavorable for women than for men in both the 2012 assessment ( $p=0.024$ ) and the 2013 assessment ( $p=0.015$ ).

### 2.4 Within subject comparisons across the two assessments made

The related samples Wilcoxon sign ranked test was applied to the distributions of six psychosocial sub-scale scores across the two assessments made by the workers, in three manners. It was applied to all the workers in the sample ( $n=14$ ), to the female workers only ( $n=8$ ) and to the male workers ( $n=6$ ). The related samples Wilcoxon sign ranked test

led to reject the null hypothesis consisting of “the median of the differences between individual psychosocial scores in the two assessments equals 0” in only a few cases.

When considering the sample consisting of both men and women, the Wilcoxon sign ranked test led to retain the null hypothesis for every one of the psychosocial sub-scales.

Considering women only (n=8), the Wilcoxon sign ranked test approached significance for psychological demands (p=0.073) and for conflicting demands (p=0.074). For this subgroup, psychological demands increased from a mean of 11.75 (sd=3.24) in 2012 to 13.63 (sd=2.62) in 2013. Conflicting demands showed a similar tendency increasing from a mean of 9.83 (2.04) in 2012 to 11.17 (2.64) in 2013, within this subgroup composed only of women (n=8).

Considering men only (n=6), the Wilcoxon sign ranked test led to reject the null hypothesis for two of the psychosocial sub-scales. The assessment score for workers control over work decreased significantly (p=0.046) from a 2012 mean of 26.17 (sd=5.08) to a 2013 mean of 22.17 (sd=5.81). The psychosocial sub-scale ratings for esteem also decreased significantly (p=0.039) from a 2012 mean of 9.67 (sd=5.01) to a 2013 mean of 8.00 (sd=5.25).

### 2.5 Odds ratios analysis

Odds ratios were calculated for the two entire sample sets, considering as exposure factor the condition of having the female gender as opposed to the male gender. The variables of interest were considered the conditions of obtaining more severe ratings in the psychosocial sub-scales in the 2013 assessment, compared to the first one, made in 2012. The odds ratios are shown in Table 4, with 95% confidence intervals (Szumilas, 2010).

*Table 4: Results for odds ratios with lower and upper bound 95% confidence intervals considering increasing severity of the psychosocial sub-scale scores as interest variables and gender (female or male) as the exposure factor (n=14).*

Psychosocial sub-scale	Odds Ratio Value	p-value	95% Confidence Interval	
			Lower	Upper
Psychological demands	8.333	0.086	0.631	110.022
Insecurity towards the future	0.600	0.640	0.070	5.136
Conflicting demands (n=11)	3.000	0.376	0.255	35.334
Workers control over work	0.067	0.031	0.005	0.970
Social support and leadership quality	0.143	0.124	0.010	1.995
Esteem	0.200	0.198	0.016	2.575

One of the odds ratios obtained achieves significance (workers control over work), while boasting an odds ratio value close to 0. This indicates that the exposure (having the female gender) is associated with much lower odds of the outcome (suffering increased severity in the rating of workers control over work from 2012 to 2013). The opposite applies for men, who saw their control over work diminish significantly and hence increase in severity in the same period.

The odds ratio for psychological demands is barely approaching significance, with an odds ratio much greater than 1. This suggests that the female participants were much more likely to suffer an increase in severity of psychological demands from 2012 to 2013, than their male counterparts.

Most of the remaining odds ratios obtained are smaller than 1. This would suggest that the exposure (belonging to the female gender) is associated with lower odds of outcome (obtaining increased severity in a psychosocial sub-scale in the period 2012-2013). However, the 95% confidence intervals cross the value 1, suggesting lack of association between exposure and outcome, which is confirmed by the p-values obtained from the Chi-Square tests.

Given the increase in conflicting demands suffered by women in the period under analysis, this sub-scale shows an odds ratio greater than 1, albeit not attaining significance.

### 3. Discussion and Conclusion

Overall, the psychosocial climate in the office studied was quite bleak in the first assessment, with no significant improvements detected in the second assessment. However, when looking at men and women separately, an intensification of severity was seen for several psychosocial risk factors. These included psychological and conflicting demands for women and workers control over work, as well as esteem, for men.

In the sample studied, men joined women in an erosion of the quality of the sub-scale of workers control over work in 2013, while women scored worse than men in this sub-scale for the 2012 psychosocial assessment. Women consistently showed more severe ratings of conflicting demands than men across the two assessments. This suggests a cultural predisposition which favors men in this regard, despite the intensification during the period between the two assessments of a pessimistic outlook in the country, as a result of economic downturn and turmoil.

From a socio-technical systems perspective (Artis & Smith-Jackson, 2014), the results suggest that for most psychosocial dimensions, the organizational design and management system in place in the company, as well as the overall cultural environment in which it operates, having remained virtually unchanged, contributed to stagnant levels of mostly severe psychosocial risk factors. However, the effect of intensification, during the period between both assessments, of a pessimistic outlook in the country, seems to have been mediated by gender based differences, considering the results obtained.

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