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The Copenhagen Psychosocial Questionnaire—a tool for the assessment and improvement of the psychosocial work environment

by Tage S Kristensen, DrMedSc,[1] Harald Hannerz, BSc,[1] Annie Høgh, MSc,[1] Vilhelm Borg, MSc [1]

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Objectives The aim of this article is to present the Copenhagen Psychosocial Questionnaire (COPSOQ), a questionnaire developed in three different lengths for assessing psychosocial factors at work, stress, and the well-being of employees and some personality factors. The purpose of the COPSOQ concept is to improve and facilitate research, as well as practical interventions at workplaces.

Methods The development of the questionnaire was based on a survey of a representative sample of 1858 Danish employees aged 20–59 years. The response rate was 62%; 49% were women. Altogether 145 questions from some international and Danish questionnaires and 20 self-developed questions were tested with factor analyses, analyses of internal reliability, and analyses of response patterns.

Results The analyses resulted in a long research version of the questionnaire with 141 questions and 30 dimensions, a medium-length version for work environment professionals with 95 questions and 26 dimensions, and a short version for workplaces with 44 questions and 8 dimensions. Most of the scales have good reliability, and there seems to be very little overlap between the scales. A novel feature of the COPSOQ is the development of five different scales on demands at work.

Conclusions The COPSOQ concept is a valid and reliable tool for workplace surveys, analytic research, interventions, and international comparisons. The questionnaire seems to be comprehensive and to include most of the relevant dimensions according to several important theories on psychosocial factors at work. The three versions facilitate communication between researchers, work environment professionals, and workplaces.

Key terms psychosocial factors; stress; survey.

The psychosocial work environment is generally considered to be one of the most important work environment issues in contemporary and future societies (1–5). A large proportion of employees in the countries of the European Union (EU) reports being exposed to psychosocial stressors at work, and the consequences are believed to be very significant for workers, workplaces, and society. Among these consequences are musculoskeletal disorders, cardiovascular diseases, mental disorders, stress, burnout, reduced quality of life, sickness absence, labor turnover, and decreased motivation and productivity. Recently, the EU member countries gave psychosocial factors "top priority" among work environment factors (6), and the directors of the European work environment institutes have estimated that psychosocial factors would be the most important research field in the future (7).

In research on psychosocial factors several different methods can be used, such as standardized questionnaires, clinical examinations, observational methods, registers, secondary data, and qualitative interviews. Most researchers agree that well-validated standardized questionnaires are necessary tools in research, as well as in practical prevention. In our article, such a tool is presented: the Copenhagen Psychosocial Questionnaire (COPSOQ).

Background and aim

When the Psychosocial Department was established at the National Institute of Occupational Health in Denmark in the middle of the 1990s, we were approached by work environment professionals from occupational health services, from the national Work Environment

1 The National Institute of Occupational Health, Copenhagen, Denmark.

Correspondence to: Dr TS Kristensen, National Institute of Occupational Health, Lerso Parkalle 105, DK-2100 Copenhagen O, Denmark. [E-mail: tsk@ami.dk]

Authority, and from the occupational health clinics with queries about a suitable standardized and validated questionnaire in the field of the psychosocial work environment. We investigated a large number of Danish and international questionnaires but could not recommend any of them for standard use in Denmark. After some hesitation, we decided to develop our own questionnaire, or to be more precise three versions of a questionnaire: a long version for research use, a medium-length version to be used by work environment professionals, and a short version for workplaces. By developing such a "three-level instrument", we hoped to achieve the following objectives: (i) to develop valid and relevant instruments for the assessment of psychosocial factors at work, (ii) to make national and international comparisons possible, (iii) to improve evaluations of interventions, (iv) to facilitate surveillance and benchmarking, (v) to improve the communication between workplaces, work environment professionals, and researchers, and (vi) to make it easier for the users to understand difficult concepts and theories.

The three versions of the COPSOQ questionnaire were developed on the basis of the following basic principles and theoretical considerations: (i) the questionnaire should be theory-based, but not attached to one specific theory (eg, the Job Content Questionnaire), (ii) the questionnaire should consist of dimensions related to different levels of analysis (organization, department, job, person–work interface, and individual), (iii) the questionnaire should include dimensions related to worktasks, the organization of work, interpersonal relations at work, cooperation, and leadership, (iv) the questionnaire should cover potential work stressors, as well as resources such as support, feedback, commitment, and good health, (v) the questionnaire should be comprehensive (ie, there should not be any significant "white spots" in the picture painted), (vi) the questionnaire should be generic, meaning that it should be applicable in all sectors of the labor market (not only industry, but also the service sector, human service work, and communication), (vii) the medium-length and short versions should be "user friendly" with regard to work environment professionals and respondents (employees).

In the following, we present the development of the three versions of the COPSOQ questionnaire, which was based on results and analyses of the Danish Psychosocial Work Environment Study.

Study population and methods

Study population

Our analyses were based on responses to a standardized questionnaire from an age-stratified representative sample of 1858 working Danes between 20 and 60 years of age (49% women, response rate 62%). Names and addresses were provided by the Central Person Register. Two-thirds of the sample were allocated to receive a postal questionnaire, while we tried to reach the last third by telephone. (The differences between the answers of the two groups were, in most cases, minor, and there was no systematic information bias.) Two reminders were sent to nonrespondents, the second with a new questionnaire in case the first had disappeared. The 1858 respondents were classified according to job title using the International Standard Classification of Occupations (ISCO). In this paper, we report the results on job titles using 32 sufficiently homogeneous jobs with 20 respondents or more (N=1220; altogether 638 persons had jobs with less than 20 respondents). The results from the study on socioeconomic status and the psychosocial work environment have been published earlier (8).

Selection of scales

As indicated, we wanted the COPSOQ scales to cover some of the main components of relevance for research and prevention. Table 1 gives an overview of the structure of the questionnaire.

The first five scales in table 1 are "demand" scales [*1–5*]. (During the rest of the article the dimensions of the COPSOQ are referred to with numbers in italics.) These scales are related to the type of production and worktasks at the workplace. The next five scales are related to the organization of work and to job content [*6–10*]. Then follow some scales of relevance for interpersonal relations and for leadership [*11–18*]. The next two scales are at the person–work interface level [*19, 20*]. The health and well-being of the employees are elucidated through the following six scales [*21–26*], and the last four scales measure personality traits [*27–30*]. Table 1 shows the scales included in the final research questionnaire. As indicated in the following discussion, a few changes were made during the analysis phase, but these minor changes did not affect the overall structure of the dimensions of the COPSOQ (See the formation of the scales for the three levels.)

Selection of questions for the test questionnaire

Before we started to construct our test questionnaire, we collected and reviewed some international and Danish questionnaires in the field. Among the main questionnaires were the Setterlind Stress Profile (9), the Whitehall II questionnaire (10), the Short Form-36 (SF-36) questionnaire (11), the Dutch QEAW questionnaire (12), the QPS-Nordic (13), the Finnish OSQ (14), the Job Content Questionnaire (15), and some Danish questionnaires previously used by members of our group.

Table 1. Main scheme for the development of the three versions of the Copenhagen Psychosocial Questionnaire (COPSOQ).

Context and level	Scales	Sample questions
Workplace		
Type of production and tasks	1. Quantitative demands	Do you have enough time for your worktasks?
	2. Cognitive demands	Does your work require that you remember a lot of things?
	3. Emotional demands	Is your work emotionally demanding?
	4. Demands for hiding emotions	Does your work require that you hide your feelings?
	5. Sensory demands	Does your work require that you have very clear and precise eyesight?
Work organization and job content	6. Influence at work	Do you have a large degree of influence concerning your work?
	7. Possibilities for development	Do you have the possibility of learning new things through your work?
	8. Degree of freedom at work	Can you decide when to take a break?
	9. Meaning of work	Do you feel that the work you do is important?
	10. Commitment to the workplace	Do you enjoy telling others about your place of work?
Interpersonal relations and leadership	11. Predictability	At your place of work, are you informed well in advance about, for example, important decisions, changes, or plans for the future?
	12. Role clarity	Do you know exactly how much say you have at work?
	13. Role conflicts	Are contradictory demands placed on you at work?
	14. Quality of leadership	To what extent would you say that your immediate superior is good at work planning?
	15. Social support	How often do you get help and support from your colleagues?
	16. Feedback at work	How often does your superior talk with you about how well you carry out your work?
	17. Social relations	Do you work isolated from your colleagues?
	18. Sense of community	Is there a good atmosphere between you and your colleagues?
Work–individual interface		
	19. Insecurity at work	Are you worried about becoming unemployed?
	20. Job satisfaction	Regarding your work in general, how pleased are you with the people you work with?
Individual		
Health and well-being	21. General health	In general, would you say your health is excellent, very good, good, fair or poor?
	22. Mental health	How much of the time during the past 4 weeks have you been a very nervous person?
	23. Vitality	How much of the time during the past 4 weeks did you feel worn out?
	24. Behavioral stress	During the past 4 weeks, I have not had the time to relax or enjoy myself.
	25. Somatic stress	How much of the time during the past 4 weeks have you had a stomach-ache or stomach problems?
	26. Cognitive stress	How much of the time during the past 4 weeks have you found it difficult to think clearly?
Personality	27. Sense of coherence	I believe I can cope with most situations in life.
		What do you usually do when problems arise at work?
	28. Problem-focused coping	- Do you try to find out what you can do to solve the problem?
	29. Selective coping	- Do you try to think of something else or do something you like?
	30. Resignation coping	- Do you accept the situation because there is nothing to do about it anyway?

Among the reviewed questionnaires, only the QPS-Nordic was close to meeting our needs. This is a modern, comprehensive, and very well validated questionnaire, but we missed some dimensions, such as emotional and cognitive demands, the meaning of work, job insecurity, job satisfaction, stress, and health. Furthermore, this questionnaire does not have national reference values, and it does not exist at three levels. With regard to other widely used questionnaires, such as the Job Content Questionnaire (15) and the questionnaire on effort–reward imbalance (16), they were too limited in scope for our purpose.

With respect to the individual questions, we preferred them to be straightforward and simple and formulated as real questions—not as statements such as "I get sufficient support from my superior". Our qualitative pilot studies with regard to some of the questionnaires have indicated that most respondents dislike "questions" of the "statement type". Along the same line of thought, we avoided response categories such as "agree" or "strongly disagree", since such response categories assume that the questions are about attitudes. Furthermore, we avoided questions in which the stressor and the stress-response were mixed together, such as: "Do you feel stressed by your work?" or "Is your workpace very demanding?" In most cases we preferred five response options to increase precision and reliability and to provide a reasonable range of choices for the respondents. For most of the questions, we used either intensity (from "to a very large extent" to "to a very small extent") or frequency (from "always" to "never/hardly ever"), preferring the format that fit the question. We ended with 165 questions in the test questionnaire (including 20 new questions formed by us) intended to capture 31 psychosocial dimensions. [See www.ami.dk/apss for the

complete list of questions.] In addition, we included 13 questions on background, 10 questions on conflicts, bullying, sexual harassment, and violence, 8 questions on family-work issues, and 1 on tobacco.

Formation of scales for the three levels

The focus of the COPSOQ is the scales measuring psychosocial factors at work, individual health and well-being, and personality factors such as coping style and sense of coherence (SOC). The questions on violence, harassment, and family–work interface are optional in the long and medium-length versions and will not be discussed in this paper. All the scales in the long and medium-length questionnaires go from 0 to 100 with high values representing a high level of the concept being measured. Therefore a high value on, for example, the "mental health" scale [*22*] means good mental health, while a high value on the "somatic stress" scale [25] indicates a high stress level. All of the scales were constructed as simple averages with equal weights for the items and equal intervals between the response options. A person was considered missing on a scale if fewer than half of the questions in the scale were answered.

The long questionnaire

For the construction of the scales for the long questionnaire, we used principal-component factor analyses and analyses of internal reliability. In the factor analyses we looked for weak loadings and cross-loadings on other scales. Items with cross-loadings above 0.40 or with loadings of less than 0.40 were excluded. With regard to the internal reliability, we analyzed inter-item correlations and item correlations with the whole scale. (The "rules of thumb" were that inter-item correlations should be between 0.20 and 0.70 and that correlations with the total scale should be above 0.40.) Furthermore, we inspected the response distribution of the individual items. Our guiding principle was to avoid floor or ceiling effects and also to avoid items with more than 5% missing values. We started out with 19 work environment scales, 2 scales for the work–individual interface [*19, 20*], 6 scales on health/well-being/stress [*21–26*], and 4 on personality/coping [*21–30*]. These scales were based on our theoretical expectations. The factor analyses and our inspection of the items forced us, however, to change most of the scales. In fact, only four of our original work environment scales "survived" in the intended form [*10, 12–14*]. The two SF-36 scales on mental health and vitality [*22, 23*] could not be confirmed as separate dimensions in our factor analyses. However, we decided to keep the three SF-36 scales [*21–23*], the three stress profile scales [*24–26*], and the SOC scale [*27*] unchanged in our long questionnaire in order to facilitate comparisons with the work of other researchers. Moreover, our analyses resulted in the abandonment of scales on "demands for responsibility at work" and "repetitive work", and in the formation of a new and unintended scale on "demands for hiding emotions". In this way, we ended up with 30 scales based on 141 items (table 2).

As shown in table 2, the long questionnaire includes 18 work environment dimensions covering three main

Table 2. Scales, number of questions, and Cronbach's alphas for the three versions of the Copenhagen Psychosocial Questionnaire (COPSOQ). (N=1603–1850 for the different scales)

Scale	Long questionnaire		Medium-length questionnaire		Short questionnaire	
	Questions (N)	Cronbach's α	Questions (N)	Cronbach's α[a]	Questions (N)	Cronbach's α[a]
1. Quantitative demands	7	0.80	4	0.65	3	
2. Cognitive demands	8	0.86	4	0.78		
3. Emotional demands	3	0.87	3	(0.87)	2	0.68
4. Demands for hiding emotions	2	0.59	2	(0.59)	1	
5. Sensory demands	5	0.70	4	0.66		
6. Influence at work	10	0.83	4	0.73	3	
7. Possibilities for development	7	0.82	4	0.75	2	
8. Degree of freedom at work	4	0.68	4	(0.68)	1	0.78
9. Meaning of work	3	0.77	3	(0.77)	2	
10. Commitment to the workplace[b]	4	0.74	4	(0.74)	2	
11. Predictability	2	0.78	2	(0.78)	2	
12. Role clarity[b]	4	0.77	4	(0.77)		
13. Role conflicts[b]	4	0.72	4	(0.72)		
14. Quality of leadership[b]	8	0.93	4	0.87	2	
15. Social support	4	0.74	4	(0.74)	2	0.81
16. Feedback at work	2	0.64	2	(0.64)	2	
17. Social relations	2	0.65	2	(0.65)		
18. Sense of community	3	0.80	3	(0.80)	2	
19. Insecurity at work	4	0.61	4	(0.61)	4	(0.61)
20. Job satisfaction	7	0.84	4	0.75	4	(0.75)
21. General health[b]	5	0.75	5	(0.75)	1	–
22. Mental health[b]	5	0.80	5	(0.80)	5	(0.80)
23. Vitality[b]	4	0.80	4	(0.80)	4	(0.80)
24. Behavioral stress[b]	8	0.79	4	0.65		
25. Somatic stress[b]	7	0.76	4	0.62		
26. Cognitive stress[b]	4	0.85	4	(0.85)		
27. Sense of coherence[b]	9	0.71				
28. Problem-focused coping	2	0.75				
29. Selective coping	2	0.61				
30. Resignation coping	2	0.66				
Number of questions	141		95		44	
Number of scales	30		26		8	

[a] For the medium-length and short questionnaires alphas are in parentheses for the scales that are identical to the scales in the long questionnaire.
[b]These scales remained in the final COPSOQ as intended before the statistical analyses.

domains of the psychosocial work environment: demands at work [*1–5*], work organization and job content [*6–10*], and interpersonal relations and leadership [*11–18*]. The distinction between five different kinds of demands is a specific feature of the COPSOQ. The work–individual interface dimensions [*19, 20*] and the health and well-being dimensions [*21–26*] are normally treated as end points, while the personality dimensions [*27–30*] are often analyzed as modifying factors in the associations between work characteristics and (health) effects.

The medium-length questionnaire

The next step was to create the medium-length version of the questionnaire. The reduction in the number of items was accomplished in two ways. First, the four individual-level scales on coping and SOC were excluded since the medium-length questionnaire is to be used for the evaluation of workplaces and jobs and not persons. Second, we reduced the length of all the longer scales to a maximum of four items (with the exceptions of the two 5-item scales from the SF-36 [*21, 22*]). In this reduction process we tried to keep the new scales as broad as the original scales and not per se to get as high an internal reliability as possible. Our analyses showed that the reduced scales explained 85–96% of the variation of the longer scales. The medium-length questionnaire consists of 95 questions forming 26 scales (table 2).

Our next step was to develop a user-friendly software system for the medium-length questionnaire to be used by work environment professionals. In this system, all the scales have been transformed into adjusted scales with a median value of 50 points in our representative database. Furthermore, 60 points corresponds to the 60% percentile, 90 points to the 90% percentile, and so forth. In the graphics of the software presentation program, all of the bars between 40 and 60 are yellow, bars above 60 are green, and bars below 40 are red. For the nine scales for which the high values are "bad" ("quantitative demands" [*1*], "emotional demands" [*3*], "demands for hiding emotions" [*4*], "sensory demands" [*5*], "role conflicts" [*13*], "insecurity at work" [*19*], and the three stress scales [*24–26*]), the red and green colors are reversed. This program makes it simple for the professionals to spot the "problem areas" (red) and the "resource areas" (green). With groups of 20 persons or more, deviations of 10 points from the median value of 50 is normally statistically significant. Therefore all the comparisons with this software program are with the Danish national average level. If other normative levels are wanted, the program has to be changed accordingly.

Table 3. Origin of the questions included in the test questionnaire and in the three final versions of the Copenhagen Psychosocial Questionnaire (COPSOQ). (SF-36 = Short Form-36, QEAW = questionnaire on the experience and assessment of work, QPS Nordic = General Nordic Questionnaire, OSQ = Occupational Stress Questionnaire)

Original questionnaire	COPSOQ questionnaire			
	Test	Long	Medium	Short
Stress profile (9)	33	32	16	3
Whitehall II (10)	30	28	16	12
SF-36 (11)	14	14	14	10
QEAW (Dutch) (12)	11	11	10	2
QPS Nordic (13)	9	6	4	1
OSQ (Finnish) (14)	2	2	2	1
Job Content Questionnaire (15)	1	1	0	0
Danish questionnaires	45	34	24	9
New questions	20	13	9	6
Total	165	141	95	44

The short questionnaire

In order to construct the short questionnaire, we entered all of the 18 work environment scales of table 2 into a new factor analysis. This time, the following three main clusters of scales emerged: (i) demands at work, (ii) work organization and content, and (iii) interpersonal relations and leadership. We decided to pick items from the middle-length questionnaire that represent these three main dimensions of work. This selection of items was done by two of us (TSK and VB) on a theoretical basis, and it was not guided by statistical procedures. Furthermore, we chose to reduce the number of items by not including the three stress scales [*24–26*] and by using just one item to assess general health [*21*]. In this way, the short questionnaire ended up consisting of 44 questions forming 8 scales (table 2).

In the user-friendly version of the short questionnaire, we developed a simple scoring system, which makes it possible to calculate the average scores of departments or workplaces for the eight dimensions. In the instruction pamphlet, we explain how to interpret and evaluate these scores.

Origins of the questions used at the three levels

In table 3 we show the source of the questions used for the three versions of the questionnaire. The stress profile items include the three stress scales [*24–26*] and the scale on SOC [*27*] (9). The Whitehall II questions include the scale on job satisfaction [*20*] and some items on support, influence, and job demands (10). The SF-36 questions are the three scales on "general health", "mental health", and "vitality" [*21–23*] (11). The Dutch QEAW contributed with items on emotional demands, cognitive demands, and other work-related factors (12). All of the other questionnaires are represented with less than 10 questions in our long questionnaire.

Results

In this section we (i) present the basic structure of the COPSOQ questionnaires, (ii) bring coefficients of internal reliability, average scores, standard deviations and proportions of missing values of the scales, (iii) analyze intercorrelations between the scales, and (iv) present two psychosocial job-exposure matrices in order to elucidate the validity.

Psychometrical characteristics

The Cronbach's alpha for internal reliability was lower than the conventional 0.70 for seven of the research scales, but most of these scales are short (2–3 items), and therefore the probability of low alphas was increased (table 2). The item correlations with the total scale were higher than 0.40 for five of the cases with low alphas. The two scales with low item correlations with the total scale are "degree of freedom at work" [*8*] and "insecurity at work" [*19*]. As has already been mentioned, high internal reliability was not a goal in the development of the two other versions of the questionnaire.

In table 4, the average scores and the standard deviations are shown for all of the scales. It follows directly from the preceding remarks that we tried to avoid scales with very high or low average scores. The table shows that we succeeded with the work environment scales, since 15 of the 18 long work environment scales had average levels between 25 and 75. The three exceptions were "meaning of work" [*9*], "role clarity" [*12*], and "sense of community" [*18*] with high values reflecting positive assessments by the Danish respondents. The SF-36 scales [*21–23*] also had relatively high average values (indicating good levels of health status), and the Setterlind stress scales [*24–26*] had low average values (indicating relatively few of the stress symptoms measured).

In table 5 we show the proportion of missing values for the individual questions and the scales. For 24 of the 30 scales in the long questionnaire, the missing values made up less than 5%. Of the six scales with higher levels of missing values, five were about interpersonal relations and leadership. Closer inspection showed that almost all of the items with many nonrespondents dealt with leadership and supervisors. Other questions assumed the presence of colleagues in the daily work of the respondent. It seems obvious that many respondents did not answer these questions because they found them irrelevant for their daily work situation. We did have a response category of "irrelevant" for most of these items, but many respondents did not tick the appropriate box. The scale for "insecurity at work" [*19*] also had many missing values. This was the only scale based on questions with "yes-no" response options. It is our impression that many respondents felt that they could have used more than these two options.

Validity of the questionnaire and scales

The basic question with regard to validity is "Do we measure what we intend to measure?" Since the COPSOQ comprises 141 questions forming 30 scales of different lengths, it is impossible within the limits of one article to go into any depth about the individual scales. Many of the scales were, in fact, analyzed very carefully by the researchers who developed them or used them in their research (9–11). Instead, in this article, we concentrate on the validity of the questionnaire by analyzing the correlations between the scales and constructing

Table 4. Average scores and standard deviations of the Copenhagen Psychosocial Questionnaire (COPSOQ) scales. (N=1603–1850 for the different scales)

Scale	Long questionnaire		Medium-length questionnaire		Short questionnaire	
	Mean	SD	Mean	SD	Mean	SD
1. Quantitative demands	44.3	17.9	46.8	18.6		
2. Cognitive demands	62.8	19.3	62.9	21.5		
3. Emotional demands	37.8	25.5	37.8	25.5		
4. Demands for hiding emotions	30.3	22.6	30.3	22.6	42.0	16.8
5. Sensory demands	63.9	21.0	62.4	23.2		
6. Influence at work	62.8	18.8	55.4	24.2		
7. Possibilities for development	68.5	18.4	72.4	19.1		
8. Degree of freedom at work	64.8	25.3	64.8	25.3	65.3	16.6
9. Meaning of work	77.7	16.4	77.7	16.4		
10. Commitment to the workplace	57.1	21.4	57.1	21.4		
11. Predictability	60.4	23.3	60.4	23.3		
12. Role clarity	75.7	14.9	75.7	14.9		
13. Role conflicts	37.3	18.5	37.3	18.5		
14. Quality of leadership	56.7	20.8	55.5	21.4		
15. Social support	68.3	20.4	68.3	20.4	58.9	15.9
16. Feedback at work	39.2	23.3	39.2	23.3		
17. Social relations	67.7	30.1	67.7	30.1		
18. Sense of community	82.0	17.4	82.0	17.4		
19. Insecurity at work	16.9	25.1	16.9	25.1	16.9	25.1
20. Job satisfaction	69.3	15.6	68.2	16.7	68.2	16.7
21. General health	80.9	16.9	80.9	16.9	75.9	19.8
22. Mental health	79.0	15.1	79.0	15.1	79.0	15.1
23. Vitality	64.1	18.8	64.1	18.8	64.1	18.8
24. Behavioral stress	15.5	15.0	17.1	17.4		
25. Somatic stress	16.0	14.2	19.1	16.1		
26. Cognitive stress	20.0	18.5	20.0	18.5		
27. Sense of coherence	81.9	13.3				
28. Problem-focused coping	83.4	16.7				
29. Selective coping	34.9	23.1				
30. Resignation coping	29.0	22.5				

Table 5. Proportion of missing values for the individual questions and the scales of the long version of the Copenhagen Psychosocial Questionnaire (COPSOQ).

Scale	Range of values missing for the scale items (%)	Values missing for the whole scale (%)
1. Quantitative demands	1.6–4.1	3.6
2. Cognitive demands	3.7–4.7	3.7
3. Emotional demands	3.1–3.9	3.0
4. Demands for hiding emotions	3.3–4.0	2.5
5. Sensory demands	3.8–4.8	3.8
6. Influence at work	3.6–4.1	3.5
7. Possibilities for development	3.0–4.3	2.8
8. Degree of freedom at work	3.7–3.9	3.4
9. Meaning of work	2.9–3.2	3.0
10. Commitment to the workplace	3.0–3.3	2.9
11. Predictability	2.2–4.3	2.2
12. Role clarity	4.3–4.7	4.3
13. Role conflicts	4.2–4.7	4.3
14. Quality of leadership	9.9–10.5	13.6
15. Social support	3.4–6.2	6.1
16. Feedback at work	3.6–6.1	7.1
17. Social relations	5.7–5.9	5.6
18. Sense of community	5.8–5.9	8.9
19. Insecurity at work	5.7–6.2	5.8
20. Job satisfaction	4.5–4.8	5.2
21. General health	0.4–3.3	1.0
22. Mental health	1.7–3.3	1.5
23. Vitality	1.0–2.6	0.8
24. Behavioral stress	0.9–2.5	1.1
25. Somatic stress	1.7–2.6	1.3
26. Cognitive stress	2.2–2.7	1.3
27. Sense of coherence	1.0–3.6	1.6
28. Problem focused coping	3.2–3.6	3.1
29. Selective coping	3.9–4.7	3.3
30. Resigning coping	3.4–3.7	3.3

"job-exposure matrices" (17, 18) with some of the newly developed scales.

A sign of low validity would be that the scales meant to measure different theoretical constructs were highly correlated. Normally, a correlation above 0.70 between two scales is considered "too high" (19). In table 6 we show the correlations between the 18 work environment scales [*1–18*]. The highest correlation between the demand scales [*1–5*] is between "emotional demands" [*3*] and "demands for hiding emotions" [*4*] (r=0.46). Among the five scales on work organization and content [*6–10*] the highest correlation was between "possibilities for development" [*7*] and "meaning of work" [*9*] (r=0.54). Finally, the highest correlation between the scales on interpersonal relations and leadership [*11–18*] occurred between "predictability" [*11*] and "quality of leadership" [*14*] (r=0.59). It is noteworthy that the highest correlation between all of the 18 work environment scales is between "cognitive demands" [*2*] and "possibilities for development" [*7*] (r=0.63).

Table 7 shows the correlations between the 12 remaining scales [*19–30*]. The highest correlation among all of the scales in the questionnaire was that between the two SF-36 scales "mental health" [*22*] and "vitality" [*23*] (r=0.73). This result fits well with the factor analysis in which these two scales could not be identified as two separate dimensions. The second highest correlation was between "mental health" [*22*] and "behavioral stress" [*24*] (r=–0.64). As has already been mentioned, we chose to keep these scales as originally formulated to facilitate international comparisons.

As indicated in the introduction, one of our objectives was to create a questionnaire that would be able to reflect important aspects of industrial work, as well

Table 6. Correlations between the 18 work environment scales in the long version of the Copenhagen Psychosocial Questionnaire (COPSOQ).

Scale	Spearman correlation coefficients																	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1. Quantitative demands	+																	
2. Cognitive demands	.34	+																
3. Emotional demands	.25	.45	+															
4. Demands for hiding emotions	.21	.23	.46	+														
5. Sensory demands	.12	.31	.12	.14	+													
6. Influence at work	–.04	.43	.07	–.16	–.01	+												
7. Possibilities for development	.13	.63	.19	–.02	.11	.48	+											
8. Degree of freedom at work	–.02	.14	–.21	–.23	–.08	.49	.27	+										
9. Meaning of work	–.03	.39	.10	–.10	.18	.43	.54	.19	+									
10. Commitment to the workplace	.04	.37	.36	–.01	.10	.45	.41	.21	.51	+								
11. Predictability	–.12	.20	–.05	–.16	–.01	.44	.31	.27	.35	.42	+							
12. Role clarity	–.12	.23	–.07	–.12	.16	.43	.28	.21	.46	.39	.49	+						
13. Role conflicts	.30	.18	.28	.31	.05	–.18	–.05	–.16	–.19	–.15	–.31	–.34	+					
14. Quality of leadership	–.23	.09	–.06	–.19	.02	.34	.28	.21	.37	.38	.59	.41	–.33	+				
15. Social support	–.19	.04	–.09	–.20	.04	.19	.18	.18	.25	.20	.36	.28	–.22	.54	+			
16. Feedback at work	–.04	.14	.03	–.09	.03	.23	.19	.17	.16	.20	.25	.16	–.07	.33	.34	+		
17. Social relations	–.04	–.04	–.16	–.16	–.06	–.01	.05	.19	.01	–.02	.05	–.01	–.06	.10	.25	.09	+	
18. Sense of community	–.16	.08	–.13	–.20	.09	.28	.21	.22	.34	.32	.33	.36	–.27	.45	.45	.19	.26	+

Table 7. Correlations between the scales on health, well-being, satisfaction, insecurity, and coping in the long version of the Copenhagen Psychosocial Questionnaire (COPSOQ).

Scale	Spearman correlation coefficients											
	19	20	21	22	23	24	25	26	27	28	29	30
19. Insecurity at work	+											
20. Job satisfaction	–.17	+										
21. General health	–.17	.28	+									
22. Mental health	–.15	.36	.43	+								
23. Vitality	–.12	.35	.45	.73	+							
24. Behavioral stress	.14	–.26	–.31	–.64	–.61	+						
25. Somatic stress*	.17	–.30	–.46	–.50	–.52	.46	+					
26. Cognitive stress	.18	–.31	–.36	–.54	–.53	.49	.54	+				
27. Sense of coherence	–.31	.36	.32	.46	.42	–.39	–.37	–.43	+			
28. Problem focused coping	–.09	.30	.11	.23	.21	–.17	–.14	–.22	.28	+		
29. Selective coping	.16	–.11	–.07	–.13	–.12	.11	.11	.13	–.22	–.26	+	
30. Resigning coping	.16	–.25	–.11	–.17	–.17	.17	.17	.19	–.31	–.35	.33	+

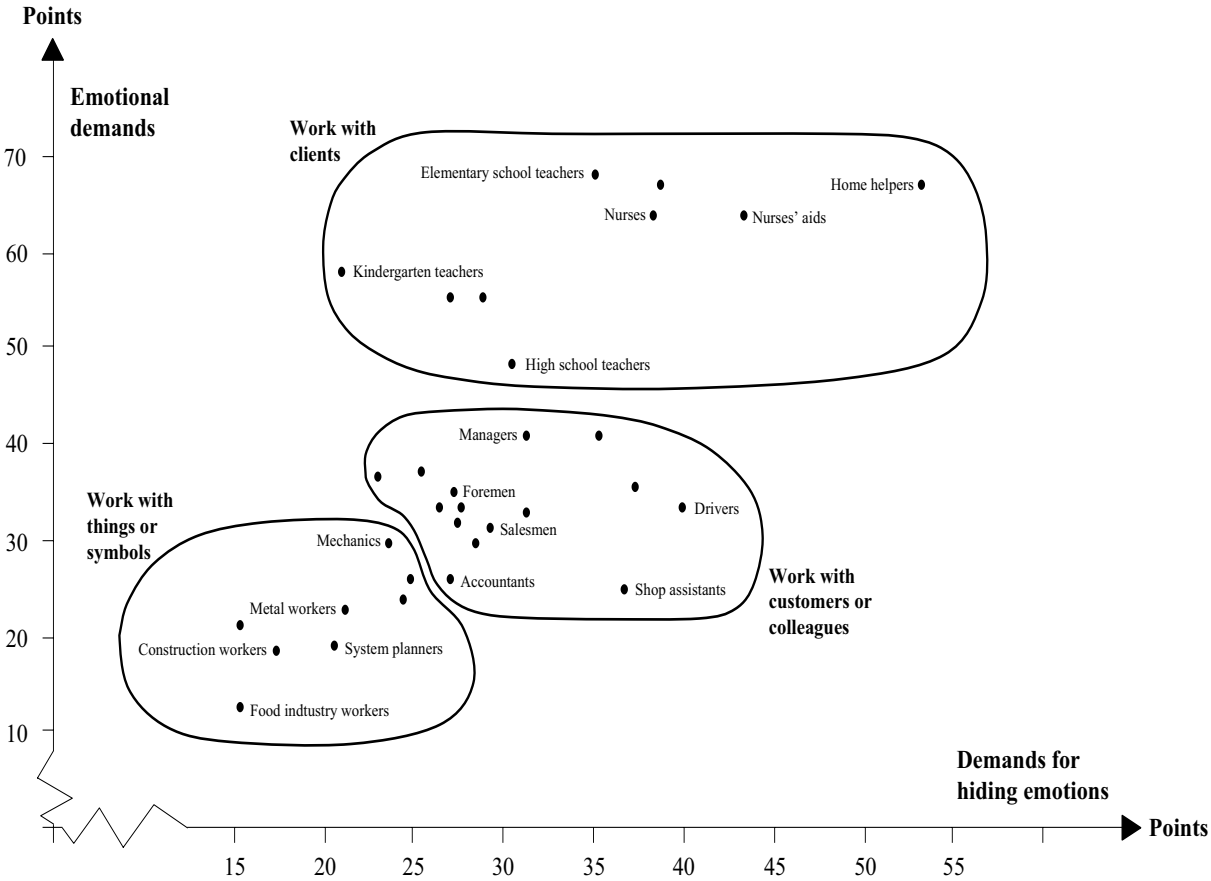

Figure 1. Distribution of the 32 jobs on the scales for emotional demands and demands for hiding emotions.

as information work and human service work. The two scales on "emotional demands" [*3*] and "demands for hiding emotions" [*4*] were particularly relevant in connection with human service work. In figure 1 we show the distribution of jobs on these two "emotion scales". The distribution of jobs in this "emotional job-exposure matrix" showed a very clear picture. Jobs with client work (patients, students, children, etc) scored high on both dimensions, while customer work and work with colleagues scored high on hiding emotions and medium high on emotional demands. Finally, jobs implying work with physical objects or symbols (computers,

communication) scored low on both dimensions. This distribution of jobs in a matrix based on the two very brief "emotion scales" is theoretically meaningful and supports the construct validity of the two scales.

In the final example, we illustrate the construct validity of two of the scales from the short version of the questionnaire, "work organization and content" and "interpersonal relations and leadership". In figure 2 we show the distribution of the 32 jobs in our sample in a matrix consisting of these two dimensions. The figure also shows jobs with high (top 10), medium (middle 12), and low (bottom 10) levels of job satisfaction. Jobs with high values on both dimensions were kindergarten teachers and managers, while jobs with low values are food-industry workers, cleaners, and drivers. The figure also demonstrates a very close association between position in the matrix and job satisfaction. The "satisfying jobs" are in the upper right part, while the "unsatisfying jobs" are in the lower left part of the figure. This positioning indicates a high correlation between the two dimensions of psychosocial work environment and the level of job satisfaction.

Discussion

The purpose of our paper is to present the COPSOQ and to discuss its special features, its weaknesses and strengths. To our knowledge COPSOQ is unique in the following ways: (i) the COPSOQ consists of questionnaires at three levels with different lengths and complexity, but based on the same analyses and basic theoretical assumptions, (ii) the COPSOQ is a concept aiming at describing a large number of relevant factors within the field of psychosocial work environment, health, well-being, and personality (iii) the COPSOQ includes five different demand dimensions, including emotional and cognitive demands, (iv) the COPSOQ includes a medium-length and a short questionnaire, each with its own user-friendly scoring system, and (v) the COPSOQ is based on comparisons with national average scores.

The analyses presented in this article show that most of the COPSOQ scales have good internal reliability and that the correlations between the scales are moderate to low, and these levels of correlation indicate that the scales measure different aspects of the work environment or the well-being of workers. As has already been mentioned, the main exception is the two SF-36 scales on "mental health" [*22*] and "vitality" [*23*]. The scales are also able to differentiate between groups (such as jobs or socioeconomic groups) within the labor market. (For more details see www.ami.dk/apss.) The issue of validity is complicated and difficult to analyze once and for all. Some of our analyses, such as the results concerning job satisfaction in figure 2, seem to indicate that our scales really capture what we intended to measure, but we have also found signs of low validity for some of our items or scales. In the years to come, we will be using the COPSOQ scales in many prospective studies being carried out the Danish National Institute of Occupational Health, and these studies will enable us to be more definite about the validity issue and also to shed

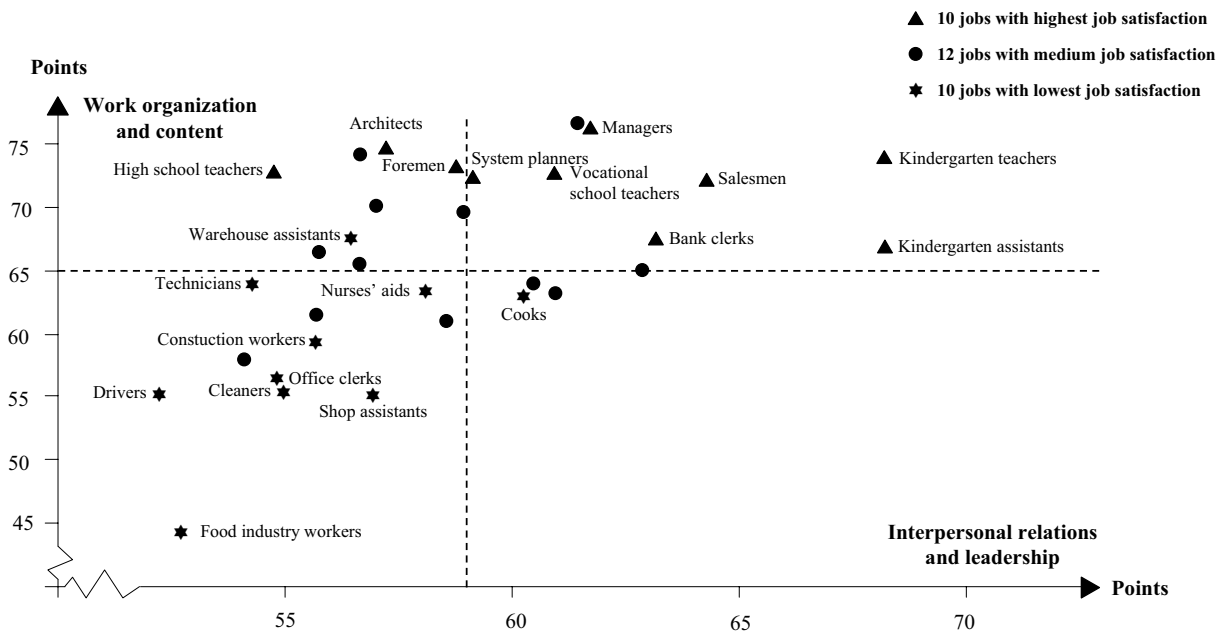

Figure 2. Distribution of jobs on the two dimensions of "work organization and content" and "interpersonal relations and leadership" in the short version of the questionnaire. Typical jobs are shown for each of the three types of work. For both scales high-quality work environment conditions are indicated with high scores. Dotted lines indicate average scores.

light on the predictive validity of the scales. In particular, the use of COPSOQ scales in the Danish Work Environment Cohort Study (20) will be one of the cornerstones of this work.

As stated in the introduction, we wanted COPSOQ to be theory-based without being based on one specific theory. This apparent self-contradiction deserves some further comments. In a recent overview of the theories on psychosocial factors at work, Kompier analyzed the following seven influential theories (5): (i) the job characteristics model, (ii) the Michigan organizational stress model, (iii) the demand–control–(support) model, (iv) the sociotechnical approach, (v) the action–theoretical approach, (vi) the effort–reward–imbalance model, and (vii) the vitamin model. One of Kompier's main points is that these seven theories, or models, include several of the same psychosocial factors at work. Skill variety, autonomy and demands play a part in six of the theories, social support is a factor in four, and three of the theories include feedback, job future ambiguity and task identity. In COPSOQ the first six of these concepts correspond closely to possibilities for development, influence, quantitative demands, social support, feedback, and job insecurity. The only missing factor seems to be task identity (the degree to which a job requires completion of a whole and identifiable piece of work). This concept, however, comes close to the COPSOQ concept of meaning of work. Therefore, the COPSOQ includes substantial parts of the main dimensions of the seven major theories in occupational health psychology.

From a theoretical point of view the major shortcomings of COPSOQ seem to be related to the effort–reward–imbalance model. This shortcoming was actually pointed out to us by kindergarten teachers, who did not understand how we could claim that they have the best psychosocial work environment in Denmark. They felt that they have a poor psychosocial work environment, and our "solution" to this paradox is that these workers receive rather low rewards (salary, esteem, and career possibilities). This explanation is in accordance with the Siegrist effort–reward–imbalance model (21). COPSOQ does include aspects of rewards, such as feedback, job (in)security, and social support, but esteem, career possibilities, and monetary rewards are missing in the questionnaire. Other aspects of work that may be missing in the present version of COPSOQ have to do with values at work, such as justice, trust, and discrimination.

Thus it is our conclusion that COPSOQ includes most of the important dimensions in the main theories of the psychosocial work environment. In this sense, we find it justified to call the questionnaire "theory-based". It should, however, be stressed that our ambition has not only been to cover some of the main factors of mainstream models from the last 50 years, but also to include dimensions related to modern worklife. Among these dimensions are cognitive demands, emotional demands, demands for hiding emotions, predictability, role clarity, and role conflicts. We find these dimensions important for describing and analyzing (human) service work, flexible work, and group work. Furthermore, these dimensions seem to play an important role in analyses of outsourcing, downsizing, and other organizational trends in today's globalized labor market. A striking example of the shortcomings of the "old questionnaires" is found in the burnout literature. Burnout is usually conceptualized as a reaction to demands in connection with doing "people work". But, as pointed out by Zapf (22), hardly any studies on burnout have tried to measure the specific factors related to this type of work, such as emotional demands, demands for hiding emotions, and role conflicts. By restricting themselves to the "well validated" questionnaires, almost all burnout researchers have missed the very specific dimensions of interest in the development of burnout.

As stated in the introduction, we also wanted the questionnaire to cover different levels of analysis. The final questionnaire includes questions at the following levels: (i) individual (health, coping [*21–30*]), (ii) individual–work interface (satisfaction, insecurity [*19, 20*]), (iii) job (eg, influence, demands, possibilities for development [*1–7*]), (iv) department (eg, quality of leadership, predictability, feedback [*11, 14, 16*]), and (v) workplace or organization (commitment to workplace, sense of community [*10, 18*]). It was also an aim to include both appreciative and problem-oriented dimensions. Some of the appreciative dimensions are commitment to the workplace, social support, and sense of community [*10, 15, 18*], while some of the more problem oriented are quantitative demands, emotional demands, and role-conflicts [*1, 3, 13*]. In practice many of the dimensions may be perceived as both appreciative and problem-oriented, depending on the results of a specific study.

While the theoretical validity is a central issue, the "tests of real life" should also be taken into consideration. We have now been using the questionnaires for a few years, and the concept has been used by many researchers, a large number of work environment professionals, hundreds of workplaces, and thousands of employees in Denmark. Moreover, the questionnaires have been or are in the process of being translated into seven languages. In quantitative terms our success has been much bigger than anticipated, which is one of the reasons for this rather late presentation of the concept in the international literature.

The wide usage of COPSOQ has enabled us to look at a very important aspect of the validity of a work environment questionnaire, the face validity: Do the employees and employers who use the questionnaire feel

that the dimensions are important and relevant? And can they recognize themselves and their own workplace when they see the results? Thus far, we have received feedback from a large number of Danish users and also from our colleagues in Spain, who are developing the Spanish version. The main impression is that the people at workplaces find the dimensions relevant and important, but also that they have to "get used to" many of the new concepts before they are able to understand the results. This will necessarily be a learning process for all the parties involved.

Our own analyses and our contacts with the users have made us aware of several problems. One of them has to do with the scale for quantitative demands [*1*]. We have discovered that this scale hides important features of quantitative demands by mixing the two fundamental aspects of these demands: number of workhours and workpace (extensive and intensive demands). Since extensive and intensive quantitative demands characterize different job groups and since these two aspects of quantitative demands may have very different consequences, this seems to be a major problem with this scale. A paper on this topic has been published (23).

Some of the individual questions have also been criticized. An example is the question "Would you like to stay at your current place of work for the rest of your worklife?" (in the scale on "commitment to the workplace" [*10*]). This item has a strong age bias, as any student could have told us. Apparently, we were too old to see the problem. Two other examples are the questions on "feedback at work" [*16*]. These are phrased as follows: "How often do you talk with your superior (colleagues) about how well you carry out your work?" Many feel that a more appropriate wording would be: "How often does your superior (colleagues) talk with you about how well you carry out your work?" Finally, we will have to address the issue of supervisors and leadership. Many people today work in loose networks, in changing groups with changing leadership, have several leaders at the same time, or have no leader. This type of situation makes it increasingly difficult to answer questions assuming a "normal" hierarchy at the workplace. The high level of missing values on several of the questions dealing with leadership shown in table 5 demonstrates a problem that will only get bigger in the years to come.

All in all, we find it reasonable to conclude that we have achieved the goals described in the introduction. The questionnaire is theory-based without being attached to a specific model, it covers most of the relevant areas in the psychosocial work environment, it includes dimensions at different levels that are appreciative as well as problem-oriented. We have identified shortcomings with regard to missing dimensions, low levels of internal reliability on a few scales, and the wording of a few items. These and other problems will be addressed in a future revision of the concept. In order to avoid confusion due to many consecutive versions, we have decided to make major revisions at intervals of at least 5 years.

Two more general issues have often been raised in connection with COPSOQ. One has to do with the use of generic questionnaires, the other with the use of national average normative values. The use of generic questionnaires, in which the same questions are used in a shipyard and in a research institution, has been criticized by many researchers, as well as by work environment professionals (24, 25). It has been pointed out that the questionnaire creates an artificial world in which very different things can be measured with the same yardstick. This characteristic also means that the respondents may be forced to answer questions with very little relevance to themselves. In the final interpretation the people at the workplace have difficulties recognizing their own work situation, and they may feel that the "problems" displayed in the report are not *their* problems. The contrast to the generic questionnaire is the specific context-based questionnaire grounded in the individual workplace and developed together with the people who work there. Such questionnaires can be much closer to the everyday problems of the workplace and include very specific and local questions.

The problem with the very specific and local questionnaires is that people often ask the researcher: "Is this good or bad? How are we doing compared with other workplaces?" Such questions can only be answered by using generic questionnaires with normative comparative values. With COPSOQ we have chosen the national average as the basis for comparison. This use too has been criticized by many users. The two main arguments have been (i) "Who says that the national average is good? Shouldn't we use a more fundamental criterion such as the risk of ill health?", and (ii) "Why are we being compared with the national average? We would like to be compared with a more relevant comparison group such as our own industry."

Basically, all this criticism is relevant and important. With regard to the issue of context, we have chosen to construct the medium-length version of the questionnaire in a way that allows the workplaces to add specific and local questions at the end of the questionnaire. For these questions there are no national comparison values, but the inclusion of local questions seems to be a very good supplement to the generic part. Many workplaces have used this option. Regarding the issue of national values, we have decided to develop industry-specific normative values for future versions of COPSOQ. These values will enable workplaces to choose between three levels of comparisons: their own workplace, their own industry, or the country.

International collaboration

Groups working with COPSOQ have now been established in six other countries. These groups have, in all cases, been initiated by local researchers or professionals who have contacted us for collaboration. We have tried to provide the necessary pieces of information and help for the translation and validation procedures. We have also tried to establish a situation in which there is one—and only one—validated COPSOQ translation in each of the countries involved. The national contact persons can be found at the website www.ami.dk/apss. It is our hope that this collaboration will grow into an international network in the years to come, not only among researchers, but also between researchers and practitioners from the occupational health system and from workplaces.

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