

## COPSOQ II

### The construction of the scales in COPSOQ II.

The purpose of this paper is to describe and explain how the scales of COPSOQ II were constructed. We started up with constructing a test-questionnaire, which contained a large proportion of the items of the old COPSOQ questionnaires but also quite a few new ones.

This test-questionnaire was in 2004-5 sent to a representative sample of adult Danes age 20-59 years. A total of 4,732 responded of whom 3,517 were employees. The response rate was 60.4% and 52% of the respondents were women.

The population of 3,517 employees comprise the study base for the analyses described in the following. We briefly describe the statistical analyses that were carried out. The purpose of the analyses was to construct the three questionnaires of the so-called *three-level COPSOQ concept*: The long questionnaire for research use, the medium size questionnaire to be used by work environment professionals, and the short questionnaire for the workplaces.

As a rule we aimed at scales with 3-4 questions (items) per scale. It is our experience that researchers prefer short scales for a number of reasons. (Primarily: competition about *space* in most questionnaires). In our test-questionnaire we had more than 4 items in many of the scales making it possible to discard items in the ensuing process.

New items and scales, which were not part of COPSOQ I, are in *italics*. The numbers correspond to consecutive numbers in the test-questionnaire.

Most of the questions in COPSOQ II have *five response options*. These are:

1. Always, Often, Sometimes, Seldom, Never/hardly ever. (Called (*Always ...*) in this paper).
2. To a very large extent, To a large extent, Somewhat, To a small extent, To a very small extent. (Called (*To a very large ...*) in this paper).

#### Work environment factors:

##### Quantitative demands:

In the test questionnaire we had five questions about quantitative demands at work:

- 32.1 Is your workload unevenly distributed so it piles up? (*Always...*)
- 32.20 How often do you not have time to complete all your work tasks? (*Always...*)
- 32.14 Do you get behind with your work? (*Always...*)
- 32.17 How often can you take it easy and still do your work? (*Always...*)
- 32.23 Do you have enough time for your work tasks? (*Always...*)

Cronbach's alpha for this scale was 0.83.

These are 5 of the 7 items from the COPSOQ I scale on quantitative demands. We had removed 2: "Do you have to work very fast?" and "Do you have to do overtime?". These two items represent the intensive and the extensive components of quantitative demands. After thorough analyses for Differential Item Function (DIF) we found it necessary to create a special scale for intensity (tempo) and also to ask specific questions on overwork (both paid and unpaid). (See the article Kristensen et al. Work & Stress about this problem).

In our analyses we found that item 32.17 ("take it easy") had the lowest correlation with the total scale. Furthermore, the factor-analyses indicated that this item should be removed since it loaded rather much on the tempo-dimension. The DIF analyses did not show any clear picture. We therefore chose to remove item 32.17.

### **Final scale for quantitative demands:**

32.1 Is your workload unevenly distributed so it piles up? (*Always...*)

32.20 How often do you not have time to complete all your work tasks? (*Always...*)

32.14 Do you get behind with your work? (*Always...*)

32.23 Do you have enough time for your work tasks? (*Always...*)

**Scale characteristics:** Correlation with the original scale of five items: 0.98. Non-response: 77. Average 40.2. SD: 20.5. Cronbach's alpha = 0.82. Item-correlations with total scale: 0.58 – 0.73. Inter-item correlations: 0.45 – 0.65.

### ***Tempo:***

Concerning tempo (intensive quantitative demands) we had formed three new questions so that we had four items in the test-questionnaire:

32.6 Do you have to work very fast? (*Always...*)

32.25 Do you work at high pace? (*Always...*)

35.35 Do you work at a high pace throughout the day? (*To a very large...*)

35.2 Is it necessary to keep working at a high pace? (*To a very large...*)

Cronbach's alpha = 0.87.

The purpose of this scale is to measure the *intensive* aspect of the quantitative demands at work. It is not so easy to ask about "the same" in several different ways, which has lead to rather similar questions in this scale. This was confirmed in the statistical analyses where no item could be pinpointed as "worse" than the others. We chose to discard item 32.25, which has a more "individual flavour" than the other items since we wanted to measure *demands* (and not the abilities of the individual).

### **Final scale for tempo at work:**

32.6 Do you have to work very fast? (*Always...*)

35.35 Do you work at a high pace throughout the day? (*To a very large...*)

35.2 *Is it necessary to keep working at a high pace? (To a very large...)*

**Scale characteristics:** Correlation with the scale of four items: 0.98. Nonresponders: 79. Average: 59.5. SD: 19.1. Cronbach's alpha: 0.84. Item correlations with total scale: 0.67 – 0.74. Inter-item correlations: 0.58 – 0.67.

### **Cognitive demands:**

Here we started out with six items from the COPSOQ I:

- 32.2 Do you have to keep your eyes on lots of things while you work? (*Always...*)
- 32.26 Does your work require that you remember a lot of things? (*Always...*)
- 32.7 Does your work demand that you are good at coming up with new ideas? (*Always...*)
- 32.15 Does your work require you to make quick decisions? (*Always...*)
- 32.22 Does your work require you to make difficult decisions? (*Always...*)
- 35.1 Does your work require a wide knowledge? (*To a very large...*)

Cronbach's alpha: 0,83.

The previous scale for cognitive demands had 8 items of which we had removed the two: "Do you have to make decisions of great importance to your place of work?" and "Do you have a responsible job?". There were a number of problems with these items (in particular the last one): Differential Item Function (DIF), a very skewed response distribution and low correlations with the rest of the scale. These two items have a large component of "management responsibility", which was not what we aimed at measuring.

By further removing items 32.15 and 35.1 we got to the old COPSOQ I scale from the medium size questionnaire, which can be an advantage in connection with comparisons. These four items measure four different aspects of cognition: overview, memory, creativity, and decisions.

### **Final scale on cognitive demands:**

- 32.2 Do you have to keep your eyes on lots of things while you work? (*Always...*)
- 32.26 Does your work require that you remember a lot of things? (*Always...*)
- 32.7 Does your work demand that you are good at coming up with new ideas? (*Always...*)
- 32.22 Does your work require you to make difficult decisions? (*Always...*)

**Scale characteristics:** Correlation with the full scale of six items: 0.97. Non-responders: 78. Average: 63.9. SD: 18.7. Cronbach's alpha: 0.74. Item-correlations with the total scale: 0.51 – 0.57. Inter-item correlations: 0.35 – 0.47.

### **Emotional demands:**

In the test questionnaire we asked four questions on emotional demands:

- 32.3 Does your work put you in emotionally disturbing situations? (*Always...*)

- 32.8 *Do you have to relate to other people's personal problems as part of your work? (Always...)*  
 35.3 *Is your work emotionally demanding? (To a very large...)*  
 35.19 *Do you get emotionally involved in your work? (To a very large...)*

We had added a single new item (32.8) in order to make the scale a bit broader since the old items were rather similar. One can criticize all the three old items for being too subjectively loaded. (They measure the reactions of the individual as much as the demands at work). In this respect the new items is probably better than the old ones.

Our statistical analyses gave no reason for discarding any of the four items in this scale. We therefore chose to keep the scale as shown above.

#### **Final scale for emotional demands:**

- 32.3 *Does your work put you in emotionally disturbing situations? (Always...)*  
 32.8 *Do you have to relate to other people's personal problems as part of your work? (Always...)*  
 35.3 *Is your work emotionally demanding? (To a very large...)*  
 35.19 *Do you get emotionally involved in your work? (To a very large...)*

**Scale characteristics:** Non responders: 76. Average: 40.7. SD: 24.3. Cronbach's alpha: 0.87. Item-correlations with the total scale: 0.65 – 0.80. Inter-item correlations: 0.54 – 0.70.

#### **Demands for hiding emotions:**

Here we asked four questions in the test questionnaire:

- 32.11 *Does your work require that you do not state your opinion? (Always...)*  
 32.21 *Are you required to treat everyone equally, even if you do not feel like it? (Always...)*  
 35.12 *Does your work require that you hide your feelings? (To a very large...)*  
 35.26 *Are you required to be kind and open towards everyone – regardless of how they behave towards you? (To a very large...)*

Cronbach's alpha: 0.62.

We had added two more items here in order to make the scale better and broader. (After all, two items isn't much for a scale!). The purpose of including the two new items (32.21 and 35.26) was to catch the essence of "emotional labour", where the employee is expected to keep a neutral façade regardless of the behaviour of the clients/customers.

Question 32.11 had a rather low correlation with the total scale (0.35). This item also had low correlations with the other items, item 32.21 in particular (0.18). Both of these correlations are below the conventional limits (0.40 and 0.20). This item also differs from the other items with regard to content, since it is about opinions and not feelings. We therefore chose to remove this item from the scale even though it was included in the previous COPSOQ scale.

#### **Final scale on demands for hiding emotions:**

32.21 *Are you required to treat everyone equally, even if you do not feel like it? (Always...)*

35.12 *Does your work require that you hide your feelings? (To a very large...)*

35.26 *Are you required to be kind and open towards everyone – regardless of how they behave towards you? (To a very large...)*

**Scale characteristics:** Correlation with the original scale of four items: 0.95. Non responders: 80. Average: 50.6. SD: 20.8. Cronbach's alpha: 0.57. Item correlations with the total scale: 0.31 – 0.45. Inter-item correlations: 0.22 – 0.39.

There are still a few problems with this scale, since item 35.12 in particular has low correlations with the total scale (0.31). The scale does, however, represent a clear improvement compared with the previous scale – both with respect to content and statistics. The good news is that the two *new* items function well. Our analyses have indicated that this scale often is important in connection with work with clients or customers. It looks like we are on the right track but still have some work to do!

### **Sensory demands.**

The 5 questions on sensory demands have been removed from the questionnaire. This scale had very low correlations with health or with other factors of interest. Furthermore, it only showed what was already well known at the workplaces. High demands on senses and movements can be important to have in mind but we hardly need a questionnaire to uncover them.

### **Influence at work:**

Concerning influence at work the test questionnaire contained 8 items:

32.4 *Do you have a large degree of influence concerning your work? (Always...)*

32.9 *Do you have a say in choosing who you work with? (Always...)*

32.24 *Can you influence the amount of work assigned to you? (Always...)*

32.18 *Do you have any influence on when you work? (Always...)*

32.12 *Do you have any influence on how you do your work? (Always...)*

32.13 *Do you have any influence on what you do at work? (Always...)*

32.27 *Do you have any influence on your work environment? (Always...)*

32.16 *Can you influence the quality of your work? (Always...)*

Cronbach's alpha: 0.79.

The previous COPSOQ long scale on influence at work included 10 items and needed shortening. The item about influence on the *pace* of work had shown large DIF in the statistical analyses and had been removed. The same goes for the item "Do other people make decisions about your work?" In this way we had 8 items left for the test questionnaire.

Of these 8 items we chose to keep the 4 items from the medium version of COPSOQ I. These items have functioned very well.

**Final scale on influence at work:**

32.4 Do you have a large degree of influence concerning your work? (*Always...*)

32.9 Do you have a say in choosing who you work with? (*Always...*)

32.24 Can you influence the amount of work assigned to you? (*Always...*)

32.13 Do you have any influence on what you do at work? (*Always...*)

**Scale characteristics:** Correlation with the long scale: 0.92. Non responders: 78. Average: 49.8. SD: 21.2. Cronbach's alpha: 0.73. Item correlations with total scale: 0.43 – 0.59. Inter-item correlations: 0.31 – 0.49.

**Possibilities for development:**

In the test questionnaire there were five items on possibilities for development, sometimes called skill discretion.

32.10 Does your work demand a high level of skill or expertise? (*Always...*)

35.4 Does your work require you to take the initiative? (*To a very large...*)

35.31 Do you have the possibility of learning new things through your work? (*To a very large...*)

35.20 Can you use your skills or expertise in your work? (*To a very large...*)

35.36 Does your work give you the opportunity to develop your skills? (*To a very large...*)

Cronbach's alpha: 0.78.

We had chosen to pull two items out of the previous scale from COPSOQ I: "Is your work varied?" and "Do you have to do the same thing over and over again?". These two items showed DIF in relation to the scale. Originally these two items were intended to form a specific scale, and we now return to that idea.

The statistical analyses pointed at item 32.10 as the clearest candidate to being removed from the scale. This item is about some stable demands to knowledge and skills and does not necessarily imply that the job has developmental possibilities. We therefore decided to remove this question from the scale.

**Final scale on possibilities for development:**

35.4 Does your work require you to take the initiative? (*To a very large...*)

35.31 Do you have the possibility of learning new things through your work? (*To a very large...*)

35.20 Can you use your skills or expertise in your work? (*To a very large...*)

35.36 Does your work give you the opportunity to develop your skills? (*To a very large...*)

**Scale characteristics:** Correlations with the long scale: 0.97. Non responders: 91. Average: 65.9. SD: 17.6. Cronbach's alpha: 0.77. Item correlations with the total scale: 0.47 – 0.70. Inter-item correlations: 0.34 – 0.70.

***Variation of work:***

Variation of work has been elucidated through two questions:

32.5 Is your work varied? (*Always...*)

32.19 Do you have to do the same thing over and over again? (*Always...*)

We have – as mentioned above – recreated this scale, which was also planned to be a scale in connection with COPSOQ I. In the international literature the questions on repetitiveness/variation are sometimes part of the scale on control or decision authority and sometimes part of the scale on skill discretion. We think that the best solution is working with a “clean” scale on this dimension.

**Scale characteristics:** Non responders: 77. Average: 60.4. SD: 21.4. Cronbach’s alpha: 0.50. (This alpha is very low, which is due to the fact the scale consists of only two items).

### **Degrees of freedom at work:**

The scale on degrees of freedom has been dropped in COPSOQ II. The primary reason is that this scale often “revealed” conditions that were already very well known by the workplaces. (Such as, e.g., few degrees of freedom among bus drivers and teachers). Besides, this factor very rarely contributes with independent “explanatory power” in analytic studies.

### **Meaning of work:**

Here we started out with three items:

35.5 Is your work meaningful? (*To a very large...*)

35.13 Do you feel that the work you do is important? (*To a very large...*)

35.32 Do you feel motivated and involved in your work? (*To a very large...*)

This scale has functioned well and is unchanged compared with the previous version of the COPSOQ.

**Scale characteristics:** Non responders: 97. Average: 73.8. SD: 15.8. Cronbach’s alpha: 0.74. Item correlations with total scale: 0.55 – 0.57. Inter item correlations: 0.48 – 0.49.

### **Commitment to the workplace:**

We started with five items on involvement in the test questionnaire:

35.21 Do you enjoy telling others about your place of work? (*To a very large...*)

35.27 Do you feel that the problems at your place of work are yours too? (*To a very large...*)

35.37 Do you feel that your place of work is of great importance to you? (*To a very large...*)

35.14 *Would you recommend a good friend to apply for a position at your workplace? (To a very large...)*

32.28 *How often do you consider looking for work elsewhere? (Always...)*

Cronbach's alpha: 0.74.

Compared with the previous scale we had dropped the item "Would you like to stay at your current place of work for the rest of your working life?". Many people – in particular younger persons – considered this question funny or even ridiculous. The item also showed considerable item bias in the statistical analyses. On the other hand, we now have included two items with a good record from other studies (35.14 and 32.28). The last of the questions can be seen as a measure of the concept "intention to quit".

The statistical analyses showed that item 35.27 correlated very poorly with the other items. After removal of this item a better scale with a higher alpha resulted. We therefore ended up with the following scale:

**Final scale for commitment to the workplace:**

35.21 Do you enjoy telling others about your place of work? *(To a very large...)*

35.37 Do you feel that your place of work is of great importance to you? *(To a very large...)*

35.14 *Would you recommend a good friend to apply for a position at your workplace? (To a very large...)*

32.28 *How often do you consider looking for work elsewhere? (Always...)*

**Scale characteristics:** Correlation with the five-item scale: 0.96. Non responders: 78. Average: 60.9. SD: 20.4. Cronbach's alpha: 0.77. Item correlations with the total scale: 0.55 – 0.61. Inter item correlations: 0.38 – 0.51.

**Predictability:**

We used the same scale as in COPSQ I:

35.6 At your place of work, are you informed well in advance concerning for example important decisions, changes, or plans for the future? *(To a very large...)*

35.22 Do you receive all the information you need in order to do your work well? *(To a very large...)*

This short scale has been functioning well even though it consists of only two items. In spite of the low number of items, it has been demonstrated that the alpha is high.

**Scale characteristics:** Non responders: 80. Average: 57.7. SD: 20.9. Cronbach's alpha: 0.74.

**Rewards:**

We had six items on rewards in the test questionnaire:

35.10 *Is your work recognised and appreciated by the management? (To a very large...)*

35.11 *Are there good prospects in your job? (To a very large...)*

35.17 *Does the management at your workplace respect you? (To a very large...)*



35.18 *Do your colleagues respect you? (To a very large...)*

35.25 *Are you treated fairly at your workplace? (To a very large...)*

35.34 *Is your salary fair in relation to your effort at work? (To a very large...)*

Cronbach's alpha: 0.79.

This is a new scale. We have wanted to include a scale for rewards at work for a long time, since we consider rewards to be a very important factor in the psychosocial work environment. However, it is not easy to measure the three components that are included under the label of *rewards* in the Siegrist Effort-Rewards Imbalance (ERI) model (recognition, salary, and career prospects) since these three forms of rewards do not necessarily reflect the same underlying quality of the work of the individual.

This expectation was confirmed by the statistical analyses. The item on salary had to be discarded immediately since it correlated very poorly with the other items. Also the item on future prospects had to be discarded because of low correlations but also due to a strong age bias. Persons who were 40-60 years of age naturally have fewer future prospects. Also the item on respect from colleagues had to be dropped, since it functioned poorly both statistically and with regard to content. Thus, we were left with a scale consisting of three items that seemed to be homogeneous and this was confirmed by factor analyses. This scale covers only one of the three sub-components of Siegrist's reward concept, namely *recognition*. With regard to content this scale is close to our scale on justice and respect, but conceptually the main difference is that this scale is about the job of the *individual* (the respondent) while the scale on justice is about the *whole company*.

#### **Final scale for rewards at work:**

35.10 *Is your work recognised and appreciated by the management? (To a very large...)*

35.17 *Does the management at your workplace respect you? (To a very large...)*

35.25 *Are you treated fairly at your workplace? (To a very large...)*

**Scale characteristics:** Correlation with the long scale for rewards: 0.92. Non responders: 98. Average: 66.2. SD: 19.9. Cronbach's alpha: 0.83. Item correlations with the total scale: 0.63 – 0.75. Inter item correlations: 0.54 – 0.70.

If the researcher is interested in including the two other components of Siegrist's reward concept in the analyses, it is possible to choose the two single items on future prospects and salary:

35.11 *Are there good prospects in your job? (To a very large...)*

35.34 *Is your salary fair in relation to your effort at work? (To a very large...)*

Furthermore, it is possible to include the scale on job insecurity if one wishes to include this kind of (negative) rewards.

#### **Role clarity:**

Concerning role clarity we had chosen to include three items in the test questionnaire:

- 35.7 Does your work have clear objectives? (*To a very large...*)  
 35.15 Do you know exactly which areas are your responsibility? (*To a very large...*)  
 35.28 Do you know exactly what is expected of you at work? (*To a very large...*)

We had excluded the item: “Do you know exactly how much say you have at work?”. This item had turned out to measure two different things: 1. The degree of influence at work. 2. Role clarity. This resulted in considerable differential item function with regard to this item. Also, the item had a low correlation with the total scale.

The statistical analyses showed that the scale functions quite well so we chose to keep the three items in the scale.

**Final scale for role clarity:**

- 35.7 Does your work have clear objectives? (*To a very large...*)  
 35.15 Do you know exactly which areas are your responsibility? (*To a very large...*)  
 35.28 Do you know exactly what is expected of you at work? (*To a very large...*)

**Scale characteristics:** Non responders: 96. Average: 73.5. SD: 16.4. Cronbach’s alpha: 0.78. Item correlations with total scale: 0.55 – 0.67. Inter item correlations: 0.48 – 0.65.

**Role conflicts:**

We had included four items on role conflicts in the questionnaire:

- 35.23 Do you do things at work, which are accepted by some people but not by others? (*To a very large...*)  
 35.8 Are contradictory demands placed on you at work? (*To a very large...*)  
 35.29 Do you sometimes have to do things, which ought to have been done in a different way? (*To a very large...*)  
 35.33 Do you sometimes have to do things, which seem to be unnecessary? (*To a very large...*)

This scale is the same as in the COPSOQ I.

The statistical analyses showed a somewhat low alpha value. However, all the items contributed equally to this picture so we kept all four items in the scale.

**Final scale for role conflicts:**

- 35.23 Do you do things at work, which are accepted by some people but not by others? (*To a very large...*)  
 35.8 Are contradictory demands placed on you at work? (*To a very large...*)  
 35.29 Do you sometimes have to do things, which ought to have been done in a different way? (*To a very large...*)  
 35.33 Do you sometimes have to do things, which seem to be unnecessary? (*To a very large...*)

**Scale characteristics:** Non responders: 93. Average: 42.0. SD: 16.6. Cronbach’s alpha: 0.67. Item correlations with total scale: 0.43 – 0.49. Inter item correlations: 0.30 – 0.41.

### Quality of leadership:

In order to assess the quality of leadership we included all eight items from the previous long questionnaire:

48. To what extent would you say that your immediate superior...
1. appreciates the staff and shows consideration for the individual? *(To a very large...)*
  2. makes sure that the individual member of staff has good development opportunities? *(To a very large...)*
  3. gives high priority to further training and personnel planning? *(To a very large...)*
  4. gives high priority to job satisfaction? *(To a very large...)*
  5. is good at work planning? *(To a very large...)*
  6. is good at allocating the work? *(To a very large...)*
  7. is good at solving conflicts? *(To a very large...)*
  8. is good at communicating with the staff? *(To a very large...)*

Cronbach's alpha: 0.94.

All of these eight items correlate highly with each other and there are no statistical reasons for preferring some of the items and not others. We therefore chose to keep the scale from the medium size questionnaire of COPSOQ I:

### Final scale for quality of leadership:

48. To what extent would you say that your immediate superior...
2. makes sure that the individual member of staff has good development opportunities? *(To a very large...)*
  4. gives high priority to job satisfaction? *(To a very large...)*
  5. is good at work planning? *(To a very large...)*
  7. is good at solving conflicts? *(To a very large...)*

**Scale characteristics:** Correlation with the full scale of 8 items: 0.98. Non responders: 852. Average: 55.3. SD: 21.1. Cronbach's alpha: 0.89. Item correlations with total scale: 0.73 – 0.79. Inter item correlations: 0.60 – 0.71.

### Social support:

Concerning social support we included the four items from the old COPSOQ questionnaires:

- 33.1 How often do you get help and support from your colleagues? *(Always...)*
- 33.2 How often are your colleagues willing to listen to your problems at work? *(Always...)*
- 47.1 How often is your nearest superior willing to listen to your problems at work? *(Always...)*
- 47.2 How often do you get help and support from your nearest superior? *(Always...)*

Cronbach's alpha: 0.74.

Our statistical analyses showed problems with this scale since the items on colleagues correlated poorly with the items on superiors. Furthermore, there appeared to be strong correlations with the items on feedback at work. Thus, we ended up with two scales on social support at work, namely one for social support from colleagues and one for social support from supervisors. These statistical results correspond very well with our experiences from giving feedback to a large number of workplaces. We were often told that people at the workplaces did not understand why support from supervisors and colleagues were not separated. All in all, we had good reasons to create two separate scales on social support instead of only one.

**Final scale for social support from colleagues:**

33.1 How often do you get help and support from your colleagues? (*Always ...*).

33.2 How often are your colleagues willing to listen to your problems at work? (*Always ...*).

33.3 How often do your colleagues talk with you about how well you carry out your work? (*Always ...*).

(For these items an extra response option: “Not relevant” has been added for those employees who might work alone without contact to colleagues. These respondents were scored as missing on this scale).

**Scale characteristics:** Non responders: 187. Average: 57.3. SD: 19.7. Cronbach’s alpha: 0.70. Item correlations with the total scale: 0.48 – 0.56. Inter item correlations: 0.39 – 0.49.

**Final scale for social support from supervisors:**

47.1 How often is your nearest superior willing to listen to your problems at work? (*Always ...*).

47.2 How often do you get help and support from your nearest superior? (*Always ...*).

47.3 How often does your nearest superior talk with you about how well you carry out your work? (*Always ...*).

(These questions were only addressed to respondents who were not supervisors themselves and who had a supervisor).

**Scale characteristics:** Non responders: 852. Average: 61.6. SD: 22.4. Cronbach’s alpha: 0.79. Item correlations with total scale: 0.59 – 0.68. Inter item correlations: 0.49 – 0.61.

Correlation between the two scales on social support from colleagues and supervisors, respectively, is 0.46 (rather low).

**Feedback:**

We included two items from the previous questionnaire:

33.3 How often do your colleagues talk with you about how well you carry out your work? (*Always ...*).

47.3 How often does your immediate superior talk with you about how well you carry out your work? (*Always ...*).

Cronbach’s alpha: 0.68.

As already stated above these two items on feedback were distributed to the two new scales on social support. Therefore, there is no separate scale on feedback in the new questionnaire.

### **Social relations:**

This scale has been dropped. Our experience has been that this scale measured a feature of the work environment that was well known in advance. For example that nurses have many relations to colleagues at work while truck drivers have few. Furthermore, social relations as such seem to have little significance for health (it is the *quality* of the social support that matters). And finally, very few workplaces felt that it was possible to change this component of the work environment.

### **Social community at work:**

We had chosen the three items from the previous questionnaire:

33.4 Is there a good atmosphere between you and your colleagues? (*Always...*)

33.5 Is there good co-operation between the colleagues at work? (*Always...*)

33.6 Do you feel part of a community at your place of work? (*Always...*)

This scale turned out to function very well and we therefore chose to keep it unchanged.

**Scale characteristics:** Non responders: 127. Average: 78.7. SD: 18.9. Cronbach's alpha: 0.86. Item correlations with total scale: 0.71 – 0.74. Inter item correlations: 0.65 – 0.68.

### **Person-work interface factors:**

#### **Job insecurity:**

Concerning job insecurity we chose to include the four "old" items from the previous questionnaire:

35.9 Are you worried about becoming unemployed? (*To a very large...*)

35.16 Are you worried about new technology making you redundant? (*To a very large...*)

35.30 Are you worried about it being difficult for you to find another job if you became unemployed? (*To a very large...*)

35.24 Are you worried about being transferred to another job against your will? (*To a very large...*)

The four items are unchanged but we have chosen to change the response options so that we now have five response options as with most of the other items in the questionnaire (instead of just yes-no).

**Scale characteristics:** Non responders: 81. Average: 23,7. SD: 20,8. Cronbach's alpha: 0,77. Item correlations with total scale: 0,51 – 0,64. Inter item correlations: 0,35 – 0,57.

**Satisfaction with work – job satisfaction:**

34. Regarding your work in general. How pleased are you with -
1. your work prospects? (*Very satisfied. Satisfied. Unsatisfied. Very unsatisfied. Not relevant*)
  2. the physical working conditions? (*Very satisfied. Satisfied. Unsatisfied. Very unsatisfied. Not relevant*)
  3. the way your department is run? (*Very satisfied. Satisfied. Unsatisfied. Very unsatisfied. Not relevant*)
  4. the way your abilities are used? (*Very satisfied. Satisfied. Unsatisfied. Very unsatisfied. Not relevant*)
  5. the interest and skills involved in your job? (*Very satisfied. Satisfied. Unsatisfied. Very unsatisfied. Not relevant*)
  6. your job as a whole, everything taken into consideration? (*Very satisfied. Satisfied. Unsatisfied. Very unsatisfied. Not relevant*)

The scale is from the Whitehall II study.

Cronbach's alpha: 0.87.

We had removed one single item from the previous research questionnaire "How satisfied are you with the people you work with?". This item did not function so well in the scale and the aspect of colleagues is covered very well in the scales on social support and social community. The item is therefore not necessary.

**Final scale for job satisfaction:**

34. Regarding your work in general. How pleased are you with -
1. your work prospects? (*Very satisfied. Satisfied. Unsatisfied. Very unsatisfied. Not relevant*)
  2. the physical working conditions? (*Very satisfied. Satisfied. Unsatisfied. Very unsatisfied. Not relevant*)
  4. the way your abilities are used? (*Very satisfied. Satisfied. Unsatisfied. Very unsatisfied. Not relevant*)
  6. your job as a whole, everything taken into consideration? (*Very satisfied. Satisfied. Unsatisfied. Very unsatisfied. Not relevant*)

**Scale characteristics:** Non responders: 122. Average: 65.3. SD: 18.2. Cronbach's alpha: 0.82. Item correlations with total scale: 0.57 – 0.71. Inter item correlations: 0.46 – 0.62.

***Family-work (im)balance:******Work family conflict:***

We chose to include four items on the possible conflict between work and private life/family:

29. *Do you often feel a conflict between your work and your private life, making you want to be in both places at the same time? (Yes, often. Yes, sometimes. Rarely. No, never).*

30. The next three questions concern the ways in which your work affects your private life:

30.1 Do you feel that your work drains so much of your energy that it has a negative effect on your private life? (Yes, certainly. Yes, to a certain degree. Yes, but only very little. No, not at all).

30.2 Do you feel that your work takes so much of your time that it has a negative effect on your private life? (Yes, certainly. Yes, to a certain degree. Yes, but only very little. No, not at all).

30.3 Do your friends or family tell you that you work too much? (Yes, certainly. Yes, to a certain degree. Yes, but only very little. No, not at all).

It was important for us to emphasize two things in our questions: First, the *direction* of the conflict (from work to private life or the other way around). Second, the two aspects of *time* and *energy*. Against item 29 one can argue that it does not indicate any direction of the conflict but the analyses showed nonetheless that this item correlated clearly with the three items on work-family conflict. We therefore chose to include the item in this scale.

**Scale characteristics:** Non responders: 101. Average: 33.5. SD: 24.3. Cronbach's alpha: 0.80. Item correlations with total scale: 0.52 – 0.74. Inter item correlations: 0.39 – 0.69.

### ***Family work conflict***

We had two questions on this dimension:

31. The next two questions concern the ways in which your private life affects your work:

31.1 Do you feel that your private life takes so much of your energy that it has a negative effect on your work? (Yes, certainly. Yes, to a certain degree. Yes, but only very little. No, not at all).

31.2 Do you feel that your private life takes so much of your time that it has a negative effect on your work? (Yes, certainly. Yes, to a certain degree. Yes, but only very little. No, not at all).

Very few employees felt that their private life influenced work, which is indicated by the very low average value of this scale.

**Scale characteristics:** Non responders: 102. Average: 7.6. SD: 15.3. Cronbach's alpha: 0.79.

### ***Values at the workplace:***

All the following questions about values are new compared with the COPSOQ I. The purpose of these items is to get a picture of *the whole workplace (company)* of the respondent and not just the person's own *job* or *department*. It is our basic assumption that values play an increasing role for the psychosocial work environment and for the recruitment of employees. Our goal with these questions is to get a picture of how well *practice corresponds to the values in the everyday life of the company*. In other words: the distance between ideals and reality. We believe that the chosen values are important for a very large proportion of all employees in most countries. Trust and justice are important human values in all cultures and it is our hypothesis that living up to these values has a great impact on not only the wellbeing of the employees but also on the social processes at the workplace.

The items chosen are inspired by a number of researchers in the fields of “trust” and “justice”. With regard to trust this applies to Cook & Wall, 1980, and regarding justice we have used Carless, 2000; Elovainio & Vahtera, 2004 and a number of others. Furthermore we have studied the questionnaire of Oxford (“The best workplace”), which also operates with these values. All items have, however, been reformulated in order to fit with the “COPSOQ format”.

We have often collaborated with workplaces that were interested in including questions on *inclusiveness (the social responsibility of the workplace)*. We therefore have included a number of items on this aspect of the psychosocial work environment also.

### ***Trust:***

We included nine items on trust at the workplace:

Top of the page:

#### THE WORKPLACE AS A WHOLE.

*The next questions are not about your own job but about the workplace as a whole.*

- 36.1 Does the management trust the employees to do their work well? (To a very large...)*
- 36.4 Can you trust the information that comes from the management? (To a very large...)*
- 36.7 Does the management withhold important information from the employees? (To a very large...)*
- 36.10 Do the employees withhold information from each other? (To a very large...)*
- 36.11 Do the employees withhold information from the management? (To a very large...)*
- 36.14 Do the employees in general trust the management? (To a very large...)*
- 36.15 Do the employees in general trust each other? (To a very large...)*
- 36.19 Are the employees able to express their views and feelings? (To a very large...)*
- 36.23 Is the organisation honest and ethical in its dealings with the rest of society? (To a very large...)*

This long scale had a Cronbach’s alpha of 0.88, which is very satisfactory. Factor analyses showed, however, that three items loaded on a common factor, namely items 36.10, 36.11 and 36.15. These three items are about the *employees’* trust in each other and their behaviour in relation to management. We therefore chose to form an independent scale for “horizontal trust” consisting of these three items. Of the remaining 6 items we chose to form a scale on “vertical trust” of items 36.1, 36.4, 36.7 and 36.19. In this way two items were left out: 36.14 (Do the employees in general trust the management?) and 36.23 (Is the organisation honest and ethical in its dealings with the rest of society?). The first of these two items was left out because it is very similar to item 36.4 while the other item – as the only one – relates to the society as a whole. Thus, we ended up with two scales on trust:

#### **Final scale for “horizontal trust”:**

- 36.10 Do the employees withhold information from each other? (To a very large...)*
- 36.11 Do the employees withhold information from the management? (To a very large...)*
- 36.15 Do the employees in general trust each other? (To a very large...)*



**Scale characteristics:** Correlation with the original trust scale with 9 items: 0.79. Non-responders: 113. Average: 68.6. SD: 16.9. Cronbach's alpha: 0.77. Item correlations with total scale: 0.48 – 0.69. Inter item correlations: 0.41 – 0.68.

**Final scale for "vertical trust":**

36.1 *Does the management trust the employees to do their work well? (To a very large...)*

36.4 *Can you trust the information that comes from the management? (To a very large...)*

36.7 *Does the management withhold important information from the employees? (To a very large...)*

36.19 *Are the employees able to express their views and feelings? (To a very large...)*

**Scale characteristics:** Correlation with the original scale for trust with 9 items: 0.93. Non responders: 87. Average: 67.0. SD: 17.7. Cronbach's alpha = 0.80. Item correlations with the total scale: 0.55 – 0.69. Inter item correlations: 0.40 – 0.56.

The two scales for trust have a correlation of 0.57, which confirms that they do not measure the same thing.

**Justice and respect:**

There were nine items on justice and respect in the test questionnaire:

*These items were under the same heading on the top of the page as the items on trust.*

36.2 *Are some employees given preferential treatment? (To a very large...)*

36.5 *Are conflicts resolved in a fair way? (To a very large...)*

36.8 *Are employees appreciated when they have done a good job? (To a very large...)*

36.12 *Are employees treated fairly? (To a very large...)*

36.16 *Is everyone at the workplace treated as equals? (To a very large...)*

36.18 *Are all suggestions from employees treated seriously by the management? (To a very large...)*

36.20 *Does the management appreciate that everyone can make a mistake every once in a while? (To a very large...)*

36.22 *Are the employees treated with respect by the management? (To a very large...)*

36.25 *Is the work distributed fairly? (To a very large...)*

This scale had a Cronbach's alpha of 0.92. The two items in which the Danish items include the words "justice" and "respect" (36.12 and 36.22) had the highest correlation with the total scale, which suggests that the scale measures what it is intended to measure.

Some of the items are a bit general and "loose". (Such as, e.g., item 36.12: "Are employees treated fairly?"). For the final scale we chose four items that were concrete and precise. In this way we ended up with the following scale:

**Final scale for justice and respect:**

36.5 *Are conflicts resolved in a fair way? (To a very large...)*

36.8 *Are employees appreciated when they have done a good job? (To a very large...)*

36.18 *Are all suggestions from employees treated seriously by the management? (To a very large...)*

36.25 *Is the work distributed fairly? (To a very large...)*

**Scale characteristics:** Correlation with the original scale of 9 items: 0.95. Non responders: 93. Average: 59.2. SD: 17.7. Cronbach's alpha = 0.83. Item correlations with total scale: 0.61 – 0.72. Inter item correlations: 0.48 – 0.66.

***Inclusiveness, the social responsibility:***

*Same heading as the items on trust and justice.*

In order to elucidate aspects of the concept of “the inclusive labour market” and “the social responsibility of the companies” we had chosen the following 7 questions:

*36.3 Are men and women treated equally at your workplace? (To a very large...)*

*36.6 Are employees with health problems well treated by the organisation? (To a very large...)*

*36.9 Is there space for diversity in the organisation? (To a very large...)*

*36.13 Is there space for employees of a different ethnic background and religion? (To a very large...)*

*36.17 Is there space for elderly employees? (To a very large...)*

*36.21 Is it possible to take care of one's family, when needed? (To a very large...)*

*36.24 Is there space for employees with various illnesses or disabilities? (To a very large...)*

This scale had an alpha of 0.79. The items on gender (36.3) and race/religion (36.13) had the lowest correlation with the other items. However, we chose to disregard statistics for the final scale. Instead we gave priority to four key domains with regard to inclusiveness: Gender, ethnicity, age, and health.

Thus, the final scale looks like this:

**Final scale for social responsibility:**

*36.3 Are men and women treated equally at your workplace? (To a very large...)*

*36.13 Is there space for employees of a different race and religion? (To a very large...)*

*36.17 Is there space for elderly employees? (To a very large...)*

*36.24 Is there space for employees with various illnesses or disabilities? (To a very large...)*

**Scale characteristics:** Correlation with the total scale of 7 items: 0.91. Non responders: 99. Average: 67.5. SD: 16.3. Cronbach's alpha: 0.63. Item correlations with total scale: 0.35 – 0.45. Inter item correlations: 0.21 – 0.41.

**Individual factors:**

***Self rated health:***

8. In general, would you say your health is: (*Excellent, Very good, Good, Fair, Poor*)

This is the global question on self-rated health from the SF-36 (Short Form 36 questionnaire). It measures the “real thing”, has a good response distribution, and has been used in a large number of

studies worldwide. Answers to this single question (or very similar ones) have been shown to predict many different endpoints including mortality, cardiovascular diseases, hospitalizations, use of medicine, absence, early retirement, etc.

In the previous questionnaire we used the whole scale on General Health from SF-36 with five items. There was, however, substantial criticism of the four other items and the response categories. We found this criticism justified and chose to drop the four items.

Thus, we use one single item to measure self-rated health in the COPSOQ II.

**Characteristics:** Non responders: 41. Average: 66.0. SD: 20.9.

**Characteristics in the total population of 20-59 years old:** Non responders: 51. Average: 64.2. SD: 23.2.

### ***Sleeping troubles:***

We included four questions on sleeping troubles:

*Top of page: These questions are about how you have been during the last 4 weeks.*

*10.1 How often have you slept badly and restlessly? (All the time; A large part of the time; Part of the time; A small part of the time; Not at all)*

*10.3 How often have you found it hard to go to sleep? (All the time...)*

*10.8 How often have you woken up too early and not been able to get back to sleep? (All the time...)*

*10.10 How often have you woken up several times and found it difficult to get back to sleep? (All the time...)*

This is the scale on poor sleep quality from the Karolinska Sleep Questionnaire. It has functioned very well in Swedish research and in our own PUMA study.

Our analyses showed that the sleep scale functions very well. There is a high internal reliability, and the four items load clearly on the same factor in factor analyses. Thus, there is no reason for changing this scale.

### ***Final scale for sleeping troubles:***

*10.1 How often have you slept badly and restlessly? (All the time; A large part of the time; Part of the time; A small part of the time; Not at all)*

*10.3 How often have you found it hard to go to sleep? (All the time...)*

*10.8 How often have you woken up too early and not been able to get back to sleep? (All the time...)*

*10.10 How often have you woken up several times and found it difficult to get back to sleep? (All the time...)*

**Scale characteristics:** Non responders: 21. Average: 21.3. SD: 19.0. Cronbach's alpha: 0.86. Item correlations with total scale: 0.62 – 0.79. Inter item correlations 0.48 – 0.74.

**Scale characteristics in the total population of 20-59 years old:** Non responders: 30. Average: 22.1. SD: 19.8. Cronbach's alpha: 0.86.

***Burnout:***

There were six items on burnout in the questionnaire:

*Top of page: These questions are about how you have been during the last 4 weeks.*

*10.2 How often have you felt worn out? (All the time; A large part of the time; Part of the time; A small part of the time; Not at all)*

*10.4 How often have you been physically exhausted? (All the time...)*

*10.6 How often have you felt vulnerable and receptive to illness? (All the time...)*

*10.7 How often have you been emotionally exhausted? (All the time...)*

*10.9 How often have you felt tired? (All the time...)*

*10.11 How often have you thought: "I cannot take it anymore"? (All the time...)*

This scale had a Cronbach's alpha of 0.86.

This is the scale for "Personal Burnout" from the CBI (Copenhagen Burnout Inventory), which has been developed in connection with the PUMA study on burnout. The questions were changed a little bit so that they fit with the COPSQ format and the time window of 4 weeks. (From the general "How often do you feel worn out?" to the more specific "How often have you felt worn out?"). Also, the response options now fit the rest of the items on symptoms. (From the general "Always", which does not fit very well on 4 weeks, to "All the time").

Two of the items had a very skewed response distribution: 10.6 and 10.11. These two items also showed weak correlations with the other items. Of the remaining items we also had minor problems with item 10.7 (emotionally exhausted). In the factor analyses this item loaded a bit on the scale on depressive symptoms. We still chose to keep the item in the scale since we wanted to cover emotional as well as physical fatigue.

Thus, we ended up with a scale with four items, which seems to function very well:

***Final scale for burnout:***

*10.2 How often have you felt worn out? (All the time...)*

*10.4 How often have you been physically exhausted? (All the time...)*

*10.7 How often have you been emotionally exhausted? (All the time...)*

*10.9 How often have you felt tired? (All the time...)*

**Scale characteristics:** Correlation with the original burnout scale: 0.97. Non responders: 22. Average: 34.1. SD: 18.2. Cronbach's alpha: 0.83. Item correlations with total scale: 0.58 – 0.75. Inter item correlations: 0.38 – 0.69.

**Scale characteristics in the total population of 20-59 years old:** Non responders: 30. Average: 34.8. SD: 18.8. Cronbach's alpha: 0.83.

**Stress:**

We tested seven stress items in the questionnaire:

*Top of page: These questions are about how you have been during the last 4 weeks.*

*10.14 How often have you had problems relaxing? (All the time; A large part of the time; Part of the time; A small part of the time; Not at all)*

*10.16 How often have you been irritable? (All the time...l)*

*10.19 How often have you been impatient? (All the time...)*

*10.22 How often have you been anxious? (All the time...)*

*10.24 How often have you been tense? (All the time...)*

*10.26 How often have you felt under pressure? (All the time...)*

*10.30 How often have you been stressed? (All the time...)*

Cronbach's alpha = 0.86.

In COPSOQ II there was a scale for Mental Health from SF-36. This scale created some problems. First, it correlated very highly with the scale for Vitality. Second, it contained two aspects of mental health, namely (di)stress and depressive symptoms. In the new questionnaire we have chosen to separate the two phenomena stress and depressive symptoms. We define stress as an individual state characterized by a combination of high arousal and displeasure. In the choice of symptoms we have been inspired by Peter Warr's circle model for psychological states, from which we have chosen examples characterized by the combination of arousal and displeasure.

In the new scale for stress we have also chosen not to combine positive and negative statements in the same scale. In the SF-36 scales there were positive symptoms ("a happy person") and negative ones ("nervous person") in the same scale, which created problems since the positive and negative symptoms tended to form separate scales. (This may partly be due to some people's tendency to give stereotype answers).

In connection with the reduction of the 7-item scale above we had a number of considerations regarding content as well as statistics. First about content: Two of the items seem to be problematic, namely 10.19 (impatient) and 10.22 (anxious). They look more like descriptions of *personality traits*, which is not what we wanted to measure. Item 10.26 (feel under pressure) looks like an item about *stressors* in the surroundings, which again is not what we wanted to measure.

Second about statistics: We analyzed the response distribution of the seven items. It turned out that 10.22 (anxious) had a very scewed response distribution with 60% of responses in the extreme response category ("not at all"). Finally, the analysis on internal reliability showed low correlations for 10.19 (impatient) and 10.22 (anxious).

Thus, we had good reasons to discard 10.19 (impatient) and 10.22 (anxious). Furthermore, we chose not to use 10.26 (under pressure) even though it functioned well statistically. As already mentioned we did not want to include items on stressors. People often confuse being in a hurry and having stress, and we did not want to contribute to this confusion.

The remaining scale of four items includes important elements in the state of stress (defined as the combination of arousal and displeasure):

***Final scale for stress:***

*10.14 How often have you had problems relaxing? (All the time...)*

*10.16 How often have you been irritable? (All the time...)*

*10.24 How often have you been tense? (All the time...)*

*10.30 How often have you been stressed? (All the time...)*

**Scale characteristics:** Correlation with the long stress scale: 0.96. Non responders: 22. Average: 26.7. SD: 17.7. Cronbach's alpha: 0.81. Item correlations with total scale: 0.57 – 0.68. Inter item correlations: 0.45 – 0.58.

**Scale characteristics in the total population of 20-59 years old:** Non responders: 32. Average: 27.0. SD: 18.2. Cronbach's alpha: 0.81.

***Depressive symptoms:***

After a thorough review of the internationally acknowledged questionnaires on depression and depressive symptoms we chose to include the following eight items in our test questionnaire:

*Top of page: These questions are about how you have been during the last 4 weeks.*

*10.5 How often have you felt sad? (All the time; A large part of the time; Part of the time; A small part of the time; Not at all)*

*10.12 How often have you lacked energy and strength? (All the time...)*

*10.13 How often have you been in a bad mood? (All the time...)*

*10.17 How often have you been upset? (All the time...)*

*10.20 How often have you lacked self-confidence? (All the time...)*

*10.27 How often have you lost your appetite? (All the time...)*

*10.32 How often have you had a bad conscience or felt guilty? (All the time...)*

*10.34 How often have you lacked interest in everyday things? (All the time...)*

Cronbach's alpha: 0.88.

Our purpose with this scale is not to try to diagnose clinical depression but to develop a simple scale measuring the degree of depressive symptoms in persons belonging to the working population.

In our analysis of the items and results we were somewhat sceptical in relation to item 10.12 (energy and strength) since it was close to the dimension on burnout. Furthermore, the items 10.5 (sad), 10.13 (bad mood), and 10.17 (upset) seemed to be too similar.

The statistical analysis showed that the item on appetite (10.27) functioned poorly since 76% never had problems with appetite.

All in all, we chose to discard the items on appetite (10.27), energy and strength (10.12), upset (10.17), and bad mood (10.13). Of the three very similar items we chose to keep item 10.5 (sad) in the scale, since sadness is an important depressive symptom.

In this way we ended up with the following scale for depressive symptoms:

***Final scale for depressive symptoms:***

*10.5 How often have you felt sad? (All the time...)*

*10.20 How often have you lacked self-confidence? (All the time...)*

*10.32 How often have you had a bad conscience or felt guilty? (All the time...)*

*10.34 How often have you lacked interest in everyday things? (All the time...)*

**Scale characteristics:** Correlation with the total scale for depressive symptoms: 0.95. Non responders: 24. Average: 21.0. SD: 16.5. Cronbach's alpha: 0.78. Item correlations with total scale: 0.52 – 0.59. Inter item correlations: 0.39 – 0.51.

**Scale characteristics in the total population of 20-59 years old:** Non responders: 36. Average: 22.1. SD: 17.4. Cronbach's alpha: 0.78.

**Somatic stress:**

We chose to include six items on somatic stress in our questionnaire. Four of these were also included in the previous questionnaire, although in a slightly different form.

*Top of page: These questions are about how you have been during the last 4 weeks.*

*10.18 How often have you felt nauseous? (All the time; A large part of the time; Part of the time; A small part of the time; Not at all)*

*10.21 How often have you had stomach ache? (Changed a little) (All the time...)*

*10.25 How often have you had a headache? (All the time...)*

*10.28 How often have you been dizzy? (Changed a little) (All the time...)*

*10.31 How often have you had palpitations? (Changed a little) (All the time...)*

*10.35 How often have you had tension in various muscles? (Changed a little) (All the time...)*

Cronbach's alpha = 0.77.

The items on the somatic stress symptoms have been changed slightly compared with the previous questionnaire in order to fit the general lay-out. Furthermore, we have added two new symptoms that we missed in the old questionnaire (nauseous and headache). And finally, we removed three items (chest pains, short of breath, and tendency to sweat) due to a very low prevalence of these symptoms.

The statistical analyses showed that a number of these items had a very skewed response distribution. This applies to 10.18 (nauseous), 10.21 (stomach ache), 10.28 (dizzy), and 10.31 (palpitations) where 67-81% used the extreme response category. Furthermore, the analyses for internal reliability showed that items 10.18 (nauseous) and 10.28 (dizzy) had low correlations with the other symptoms. We analysed if the removal of these items would give bias in relation to gender but this appeared not to be the case.

In conclusion, we decided to remove items 10.18 and 10.28, which left us with the following scale with four items:

**Final scale for somatic stress:**

10.21 How often have you had stomach ache? (*All the time; A large part of the time; Part of the time; A small part of the time; Not at all*)

10.25 How often have you had a headache? (*All the time...*)

10.31 How often have you had palpitations? (*All the time...*)

10.35 How often have you had tension in various muscles? (*All the time...*)

**Scale characteristics:** Correlation with the long scale for somatic stress: 0.97. Non responders: 22. Average: 17.8. SD: 16.0. Cronbach's alpha: 0.68. Item correlations with total scale: 0.43 – 0.50. Inter item correlations: 0.31 – 0.47.

**Scale characteristics in the total population of 20-59 years old:** Non responders: 35. Average: 18.4. SD: 16.6. Cronbach's alpha: 0.69.

**Cognitive stress:**

We included four items on cognitive stress from the previous questionnaire:

*Top of page: These questions are about how you have been during the last 4 weeks.*

10.15 How often have you had problems concentrating? (*All the time; A large part of the time; Part of the time; A small part of the time; Not at all*)

10.23 How often have you found it difficult to think clearly? (*All the time...*)

10.29 How often have you had difficulty in taking decisions? (*All the time...*)

10.33 How often have you had difficulty with remembering? (*All the time...*)

This is the scale from the previous version of COPSOQ, which has functioned very well. (We changed the format of the questions so that they fit the format with the time window at the top of the page).

All the analyses confirmed this scale so we chose to keep it for the new questionnaire.

**Scale characteristics:** Non responders: 24. Average: 17.8. SD: 15.7. Cronbach's alpha: 0.83. Item correlations with total scale: 0.60 – 0.70. Inter item correlations: 0.45 – 0.64.



**Scale characteristics in the total population of 20-59 years old:** Non responders: 36. Average: 18.7. SD: 16.6. Cronbach's alpha: 0.83.

***Self-efficacy:***

In order to assess the respondents' level of self confidence or faith in own abilities to solve unexpected or difficult problems in life we chose the following questions on self-efficacy:

*Top of page: How well do these descriptions fit on you as a person?*

*9.1 I am always able to solve difficult problems, if I try hard enough. (Fits perfectly; Fits quite well; Fits a little bit; Does not fit at all)*

*9.2 If people work against me, I find a way of achieving what I want. (Fits perfectly...)*

*9.3 It is easy for me to stick to my plans and reach my objectives. (Fits perfectly...)*

*9.4 I feel confident that I can handle unexpected events. (Fits perfectly...)*

*9.5 I keep calm when there are problems, as I trust in my ability to solve them. (Fits perfectly...)*

*9.6 When I have a problem, I can usually find several ways of solving it. (Fits perfectly...)*

*9.7 Regardless of what happens, I usually manage. (Fits perfectly...)*

Cronbach's alpha = 0.84.

The questions are from Bandura. (On self-efficacy, see, e.g. Bandura A. Self-efficacy. The exercise of control. New York: W.H.Freeman & Co., 1997).

The scale functioned well statistically, and even though the items are quite similar the correlations were not higher than they should be. In order to reduce the scale to six items we discarded item 9.5 (I keep calm). We did this for two reasons: First, the item is quite similar to item 9.4. Second, it might be considered a problem to use an item in which there is a hidden assumption (namely that the person is always calm).

In this way we reached a scale with the following six items:

**Final scale on self-efficacy:**

*9.1 I am always able to solve difficult problems, if I try hard enough. (Fits perfectly; Fits quite well; Fits a little bit; Does not fit)*

*9.2 If people work against me, I find a way of achieving what I want. (Fits perfectly...)*

*9.3 It is easy for me to stick to my plans and reach my objectives. (Fits perfectly...)*

*9.4 I feel confident that I can handle unexpected events. (Fits perfectly...)*

*9.6 When I have a problem, I can usually find several ways of solving it. (Fits perfectly...)*

*9.7 Regardless of what happens, I usually manage. (Fits perfectly...)*

**Scale characteristics:** Correlation with the long scale on self-efficacy: 0.99. Non responders: 46. Average: 67.5. SD: 16.0. Cronbach's alpha = 0.80. Item correlations with total scale: 0.45 – 0.61. Inter item correlations: 0.31 – 0.54.

**Scale characteristics in the total population of 20-59 years old:** Non responders: 75. Average: 66.8. SD: 16.9. Cronbach's alpha: 0.81.

In this particular case we did not give high priority to reaching a scale with four items since we had no plans about using the scale in the middle or short questionnaires. The reason is that the scale measures a personality trait while the purpose with the medium and short questionnaires is to characterize groups of people and their working environment – and not their individual characteristics.

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**Overview of the total number of questions in the new test questionnaire compared with the previous COPSOQ I research (long) questionnaire:**

	3D-II Test	3D-I Research
Quantitative demands	5	7
Work pace	4	0
Cognitive demands	6	8
Emotional demands	4	3
Demands for hiding emotions	4	2
Sensory demands	0	5
<b>Demands at work, total</b>	<b>23</b>	<b>25</b>
Influence	8	10
Possibilities for development	5	7
Variation	2	0
Degrees of freedom	0	4
Meaning of work	3	3
Rewards (recognition)	6	0
Commitment to the workplace	5	4
<b>Work organisation and content, total</b>	<b>29</b>	<b>28</b>
Predictability	2	2
Role clarity	3	4
Role conflicts	4	4
Quality of leadership	11	8
Social support	4	4
Feedback	2	2
Social relations	0	2
Social community	3	3
<b>Social relations and leadership, total</b>	<b>29</b>	<b>29</b>
Job insecurity	4	4
Job satisfaction	6	7
<b>Insecurity and satisfaction, total</b>	<b>10</b>	<b>11</b>

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Trust	9	0
Justice and respect	9	0
Inclusiveness	7	0
<b>Values at the workplace, total</b>	<b>25</b>	<b>0</b>
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General self-rated health	1	5
Mental health	0	5
Vitality	0	4
Sleep	4	0
Burnout	6	0
Stress	7	0
Depressive symptoms	8	0
Behavioural stress	0	8
Somatic stress	6	7
Cognitive stress	4	4
<b>Health and well-being, total</b>	<b>36</b>	<b>33</b>
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Sense of coherence	0	9
Self-efficacy	7	0
Coping	0	6
<b>Personality factors, total</b>	<b>7</b>	<b>15</b>
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<b>Number of questions, total</b>	<b>159</b>	<b>141</b>

The number of questions in the previous test questionnaire was 165 of which 141 were used in the scales of the long research questionnaire. Thus, the new test questionnaire included almost the same number of questions tested for use in the new scales.