

# **CHRIS Study**

## **Touchscreen – Pain sensitivity**

Version 1.1  
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## 1. Introduction

This module stores information related to the pain sensitivity of the participants, that was collected with the self-assessment questionnaire on a touchscreen.

Participants book a morning appointment at the CHRIS study center, ranging from 7.45 to 8.45 a.m. Each study participant is assigned a workflow at the reception. If there are ten study participants (maximum capacity), there are ten different workflows, marked with the letters from “A” to “K”. The current workflow is as follows: A-B-C-D-E-F-G-H-I-K. All the workflows can be found in the documentation of CHRIS Baseline/General information/Administrative data, in the file named “Workflows at baseline assessment”. The self-administered questionnaire is filled in always after the blood draw, for most participants before the interview (workflows B, C, E, F, H, I, L). For the remainder of participants, the self-administered questionnaire is filled in just after the interview (workflows A, G) or after the interview and the ECG measurement (workflow D).

The Pain Sensitivity Questionnaire (PSQ) was developed by Ruscheweyh and colleagues (2009), to assess general pain sensitivity, according to several modalities of exogenous nociceptive pain. Questions on the PSQ describe daily life situations, which the respondent rates as not at all painful (score 0) or the worst painful (score 10) on an 11-point discrete anchored scale. Three of the items purportedly reflect normal ‘non painful’ situations to serve as non-painful sensory reference for the respondents. One global score and two sub-scores have been proposed with the initial publication, which were named PSQ-total, PSQ-moderate, and PSQ-minor, respectively.

- **PSQ-total:** mean of questions 1, 2, 3, 4, 6, 7, 8, 10, 11, 12, 14, 15, 16, 17 (items of general pain intensity)
- **PSQ-moderate:** mean of questions 1, 2, 4, 8, 15, 16, 17 (items of moderate pain intensity)
- **PSQ-minor:** mean of the questions 3, 6, 7, 10, 11, 12, 14 (items of minor pain intensity)

Further work by Melotti et al. (2018) showed that the PSQ construction was substantially reflecting one-factor as a general dimension of pain sensitivity. After exploratory factor analysis (EFA) and confirmatory factor analysis (CFA), a selection of 10 items was proposed as an alternative and shorter assessment of general pain sensitivity, which was named the PSQ-short:

- **PSQ-short:** mean of questions 1, 2, 4, 7, 8, 10, 11, 15, 16, 17 (EFA selected items of general pain intensity)

The PSQ-total correlates with experimental pain intensity ratings, while is mainly uncorrelated with experimental pain thresholds. The PSQ-short score maintains similar psychometric properties to the PSQ-total and adds configural consistency between genders.

The PSQ is self-administered on a touchscreen through an online privacy-preserving interface. The PSQ allows rapid responses (5 to 10 minutes) and do not cause pain to participants, which is impossible to avert completely in experimental pain testing. The PSQ does not require dedicated equipment, staff, time, and associated costs and is practical to administer on a large scale.

The PSQ was originally developed in German, which is the language spoken by around 98% of CHRIS eligible participants. The PSQ was also translated in Italian by the CHRIS team, to accommodate non-German native speakers. The Italian version did not follow a formal translation back-translation process.

This aspect should be acknowledged as possible limitation, when comparing different language versions of the questionnaire.

The self-assessment questionnaires and the guide for PSQ evaluation are available at CHRIS Baseline/Self-Assessment/Touchscreen, CHRIS Baseline/Self-Assessment/Touchscreen/Pain Sensitivity, and online (see References section).

## **2. History version changes**

Version 1 of this module has been in use since August 24<sup>th</sup>, 2011 and has never been changed.

The cleaning process added the variables x0ps21, x0ps21a, x0ps22, x0ps22a, x0ps23, x0ps23a, x0ps24, and x0ps24a.

## **3. Data cleaning**

1. The main CHRIS dataset was loaded.
2. All the item variables, x0ps01-x0ps17, had their missing observations set to “Unexpected missing” (-89).
3. The Pain Sensitivity Questionnaire (PSQ) total score was computed as the mean of all the item variables related to pain (i.e. all item variables excluded x0ps05, x0ps09, x0ps13). This variable was saved as x0ps21 and it had its observations replaced with “Unexpected missing” (-89) if any of its item were “Unexpected missing” (-89).
4. The PSQ moderate score was computed as the mean of the item variables related to moderate pain (i.e. x0ps01, x0ps02, x0ps04, x0ps08, x0ps15, x0ps16, x0ps17). This variable was saved as x0ps22 and it had its observations replaced with “Unexpected missing” (-89) if any of its item were “Unexpected missing” (-89).
5. The PSQ minor score was computed as the mean of the item variables related to minor pain (i.e. x0ps03, x0ps06, x0ps07, x0ps10, x0ps11, x0ps12, x0ps14). This variable was saved as x0ps23 and it had its observations replaced with “Unexpected missing” (-89) if any of its item were “Unexpected missing” (-89).
6. The PSQ short subscore was computed as the mean of all the pain item variables, except x0ps03, x0ps06, x0ps12, and x0ps14. This variable was saved as x0ps24 and it had its observations replaced with “Unexpected missing” (-89) if any of its item were “Unexpected missing” (-89).
7. The baseline dataset was saved.

## **4. Advices for the analysis**

There are several scores calculated with the PSQ instrument: a total score (PSQ total) and two sub-scores (PSQ moderate and PSQ minor). Furthermore, the IfB researchers developed and validated the PSQ-short subscore, that consists of 10 PSQ items, and correlates well with PSQ total. In their factorial analysis they showed that all PSQ items describe a single dimension of pain, and that the distinction between moderate and minor pain might be arbitrary. Additionally, with PSQ short the same factor loadings were obtained in the factorial structure even after stratifying by sex.

Additional information related to pain was measured with the algometer instrument and it can be found in the variables x0am\*.

## **5. References**

Ruscheweyh R, Marziniak M, Stumpenhorst F, Reinholz J, Knecht S. Pain sensitivity can be assessed by self-rating: Development and validation of the Pain Sensitivity Questionnaire. Pain. 2009 Nov;146(1-2):65-74. DOI: [10.1016/j.pain.2009.06.020](https://doi.org/10.1016/j.pain.2009.06.020)

**PSQ text and scoring guidelines:** Ruscheweyh et al. 2009, sections 2.3, 3.1, and 4.3.

Melotti R, Ruscheweyh R, Pramstaller PP, Hicks AA, Pattaro C. Structural consistency of the Pain Sensitivity Questionnaire in the Cooperative Health Research In South Tyrol (CHRIS) population-based study. J Pain. 2018 Dec;19(12):1424-1434. DOI: [10.1016/j.jpain.2018.06.007](https://doi.org/10.1016/j.jpain.2018.06.007)