



# The Chronic Pain Acceptance Questionnaire: Confirmatory factor analysis and identification of patient subgroups

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Received 26 March 2008; received in revised form 4 July 2008; accepted 18 August 2008

## Abstract

Over the past decade, the importance of acceptance of chronic pain has been demonstrated. Acceptance has often been assessed using the 20-item, two-factor Chronic Pain Acceptance Questionnaire (CPAQ; McCracken, Vowles, Eccleston, Pain 2004;107:159–66). This two-factor model has been supported but awaits further confirmation. The present investigation sought to address this issue in two large samples of pain sufferers. Exploratory factor analyses ( $N = 333$ ) examined a number of solutions, ranging from two to five factors. Evaluation indices provided clear support for a 20-item, two-factor solution. Confirmatory factor analyses, using the second sample ( $N = 308$ ), examined a number of models. Fit indices demonstrated that the model identified in the exploratory analyses had the best fit. Finally, a series of cluster analyses were performed using a combined sample ( $N = 641$ ). Results indicated three clusters: one with high scores on both subscales ( $n = 146$ ), one with low scores on both subscales ( $n = 239$ ), and one with discrepant scores that were high on the Activity Engagement subscale and low on the Pain Willingness subscale ( $n = 286$ ). Follow-up analyses indicated significant differences among the clusters across multiple measures of functioning. The cluster with low CPAQ scores reported more difficulties in comparison to the group with high scores, while the group with discrepant CPAQ scores generally reported difficulties that fell in between. These results provide further support for the 20-item, two-factor CPAQ and indicate that it is both theoretically and practically useful.

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*Keywords:* Chronic Pain Acceptance Questionnaire; Chronic pain; Acceptance; Factor analysis; Cluster analysis

## 1. Introduction

Acceptance of pain has emerged as an important process that may undermine some of the suffering that often accompanies the experience of chronic pain. Previous results show that acceptance is associated with lower emotional distress and disability in persons seeking treatment for chronic pain (see [18,24] for reviews). Additional recent results show that greater acceptance of pain is associated with higher quality of life in patients with low back pain [15], decreased impact of

pain flares on functioning in patients with rheumatoid arthritis [14], and more frequent engagement in personally meaningful activities [27] and maintenance of adaptive functioning [9] in patients with mixed pain conditions.

At present, the primary index of acceptance is the Chronic Pain Acceptance Questionnaire (CPAQ). The CPAQ was developed by Geiser (1992, unpublished doctoral dissertation) as an adaptation of a more general measure of acceptance and experiential avoidance, the Acceptance and Action Questionnaire [11]. In its earliest form, the CPAQ consisted of 34 items, 24 of which were used to calculate a total score. Subsequent analyses critically evaluated the content and factor structure of the measure [23,37] and a 20 item, two-factor solution was

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found to be most appropriate [25]. The first factor, labeled Activity Engagement, assesses participation in daily activities while acknowledging the presence of pain. The second, labeled Pain Willingness, assesses the degree to which pain is allowed in experience without efforts to avoid or control it.

A number of studies have supported the utility of these two subscales (e.g., [8,15,21,22,27,31]); however, pertinent issues remain. These include the possibility of alternate factor structures and the need to determine whether both subscales contribute meaningfully to the measurement of the construct [29] (also see commentary [26] and response [30]). In addition, it is not yet clear whether there is any independence between the factors, such that some pain sufferers may score high on one and low on the other, for example. If the factors have some degree of independence, then the identification of particular groups who demonstrate discordant scores on the two subscales may provide additional information on the CPAQ's psychometric properties and clinical utility.

In this study, we sought to address the structure and potential utility of the factors underlying the CPAQ. Factor structure was evaluated using both exploratory and confirmatory factor analytic techniques. In addition, a series of cluster analyses were performed to explore whether specific subgroups of patients could be identified based on their responses to the subscales of this inventory. Finally, the validity of the identified clusters was explored by assessing whether they differed meaningfully on measures of physical and psychological functioning. The overarching goal of these analyses was to identify a psychometrically sound, parsimonious, interpretable, and clinically appropriate factor structure for use in the assessment of acceptance of chronic pain.

## 2. Methods

### 2.1. Participants

Two samples of chronic pain sufferers presenting for assessment at a tertiary care treatment center located in the southwest of England were used. Sample 1 ( $N = 353$ ) was used in exploratory analyses and sample 2 ( $N = 326$ ) in the confirmatory analyses. The samples were combined for use in the cluster analyses.

Across samples, there was a small amount of missing data. As the CPAQ was the principal measure, participants who were missing responses on this measure were not included in the analyses. In total, 20 individuals were dropped from sample 1 and 16 from sample 2. Distributions of the CPAQ scores were evaluated for normality as well. Scores were found to be normally distributed for both samples, although the inspection of box plots indicated two outliers, who had Pain Willingness scores that were more than two  $SD$ 's from the

mean in sample 2. These were excluded from the analyses. Therefore, the final samples used in the analyses included 333 and 308 participants in samples 1 and 2, respectively. For the analyses involving measures besides the CPAQ, missing data were excluded on an analysis-by-analysis basis, which resulted in a small variation in total sample size, from 592 to 635.

Sample 1 included 333 individuals (65.0% female) who presented for assessment between June 2002 and August 2004.<sup>1</sup> Average age was 45.7 years ( $SD = 11.8$ ). The majority were white (96.4%), married (61.4%), and receiving some form of compensation or wage replacement (82.3%). Median pain duration was 6.7 years (range: 1.0–55.0 years). A small proportion (13.5%) of individuals was working on a part- or full-time basis. The most commonly reported primary pain site was low back (46.1%; lower extremity: 14.6%, full body: 11.3%, upper extremity: 11.0%, neck: 9.9%, other: 7.1%). Most reported additional pain sites (80.3%).

Sample 2 included 308 individuals (65.6% female) who presented for assessment between September 2004 and July 2006. As expected, demographic characteristics were similar to sample 1. Average age was 47.6 years ( $SD = 12.0$ ) and most were white (97.9%), married (65.6%), and receiving some form of compensation or wage replacement (77.5%). Median pain duration was 7.0 years (range: 0.6–51.0 years). A minority (18.8%) was working part- or full-time. The most commonly reported primary pain site was low back (50.0%; lower extremity: 14.1%, full body: 11.7%, upper extremity: 10.4%, neck: 4.9%, other: 8.9%). As with sample 1, most reported additional pain sites (89.3%).

### 2.2. Measures

Participants completed a battery of self-report questionnaires, which was sent to them approximately one week before their clinic appointment. The majority of the measures completed by both samples were identical. Exceptions are noted in the following sections that describe the measures.

A background information form was included in the questionnaire packet, which assessed demographic characteristics, pain location and history, medication use, and number of medical visits related to pain over the previous six months (primary care, specialist, and emergency department). The medication information was used to calculate the number of different classes of medications being taken for pain. Medicines were classified according to the British National Formulary as strong

<sup>1</sup> It should be noted that this sample of 333 included 235 individuals from the initial analysis and subsequent revision of the 34-item version of the CPAQ (detailed in McCracken et al. [25]), however, we felt that it was appropriate to include them as no factor analysis of the 20-item version alone occurred in that earlier study.

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