

Accepted refereed manuscript of:

Lauwerier E, Caes L, Van Damme S, Goubert L, Rossell Y & Crombez G (2015) Acceptance: What's in a name? A content analysis of acceptance instruments in individuals with chronic pain, *Journal of Pain*, 16 (4), pp. 306-317.

DOI: [10.1016/j.jpain.2015.01.001](https://doi.org/10.1016/j.jpain.2015.01.001)

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**Acceptance: what's in a name? A content analysis of acceptance instruments
in individuals with chronic pain**

Lauwerier, E.^{1,2,*}, Caes, L.^{2,3}, Van Damme, S.², Goubert, L.², Rosseel, Y.⁴, &
Crombez, G.²

- 1 Department of Health and Technology, University Colleges Leuven-Limburg, Belgium
- 2 Department of Experimental-Clinical and Health Psychology, Ghent University, Belgium
- 3 School of Psychology, NUI Galway, Galway, Ireland
- 4 Department of Data Analysis, Ghent University, Belgium

* Corresponding author: Emelien Lauwerier, Department of Health and Technology, Leuven University College, Herestraat 49, B- 3000 Leuven, Belgium. Tel: + 32 (0)16 375 200, Fax: + 32 (0)16 375 299

Number of text pages: 16

Number of tables: 2

Number of figures: 3

Short running Title: Content Analysis of Acceptance Questionnaires

Keywords: Acceptance; Chronic Pain; Questionnaires; Content Validity

Abstract and Perspective

Instruments to assess chronic pain acceptance have been developed and used. Uninvestigated is whether and to what extent the content of the items reflects acceptance. A content analysis of thirteen instruments that aim to measure acceptance of chronic pain was performed. A coding scheme was used that consisted of three categories that represent key components of acceptance, i.e. “disengagement from pain control”, “pain willingness”, and “engagement in activities other than pain control”. The coding scheme consisted of five additional categories in order to code items that do not represent acceptance, i.e., “controlling pain”, “pain costs”, “pain benefits”, “unclear”, and “no fit”. Two coders rated to what extent the items of acceptance instruments belonged to one or more of these categories. Results indicated that acceptance categories were not equally represented in the acceptance instruments. Of note, some instruments had many items in the category “controlling pain”. Further analyses revealed that the meaning of acceptance differs between different instruments, and between different versions of the same instrument. This study illustrates the importance of content validity when developing and evaluating self-report instruments.

Perspective. This article investigated the content validity of questionnaires designed to measure acceptance in individuals with chronic pain. Knowledge about the content of the instruments will provide further insight into the features of acceptance and how to measure these.

Keywords: *Acceptance; Chronic Pain; Questionnaires; Content Validity*

1. Introduction

Acceptance has become a popular and successful psychosocial variable in explaining adaptation to pain^{31,32,33,35,37,48,49}. Likewise, there has been growing interest in acceptance-based and related interventions, such as Acceptance and Commitment Therapy (ACT)²¹ or Mindfulness Based Stress Reduction Programs (MBSR)²³. A recent meta-analysis has shown that these interventions are good alternatives to or may complement traditional therapies in improving mental and physical health of individuals with chronic pain⁴⁶.

Acceptance is a multi-faceted concept that has been defined in different ways. We recognize at least two approaches. One approach stems from behaviorism, and defines acceptance as "... a willingness to remain in contact with and to actively experience particular private experiences"¹⁸. Within this tradition, McCracken and colleagues³⁰ started research in chronic pain. Research has identified two core constituents of acceptance: a willingness to experience pain, and the engagement into valued-based life activity despite pain^{32,51,53}. The other approach originates from self-regulatory theories, in which disengagement from blocked goals and reengagement into new actions is considered as an adaptive way of coping with life dynamics^{1,4,22,38}. Within this perspective, acceptance of chronic pain has been reframed as the disengagement from the unattainable goal to control pain, and the reengagement into other valuable goals that are less affected by pain^{9,12,43,45}.

Over time, several self-report measures of chronic pain acceptance have been developed. Differences may be noted in how acceptance is measured across instruments⁴¹, possibly resulting from differences in how acceptance is defined. For example, Viane and colleagues⁴⁸ observed only a moderate correlation between the Chronic Pain Acceptance Questionnaire (CPAQ)³² and the Illness Cognition Questionnaire (ICQ)¹², indicating that "acceptance" is not alike in these two instruments. As yet, it is unclear which features of acceptance are measured by the available instruments. There is also no research on the (dis)similarities between instruments in their conceptualization of acceptance. Needed is a critical analysis of the content of the items of these questionnaires, and how they map on the different theoretical perspectives.

This study examined the item content of acceptance instruments that have been used in individuals with chronic pain. We developed a heuristic frame that included

the above mentioned accounts of acceptance. We searched for empirical studies that used acceptance instruments in individuals with chronic pain, and identified the instruments assessing acceptance. Finally, we identified which features of acceptance were reflected in and across instruments. This was achieved by coding items into the categories of our heuristic frame, and by using multidimensional scaling.

2. Materials and Methods

2.1. Search strategy

Studies were collected through a search of the Medline, Psychinfo and Web of Science databases using the search terms 'acceptance' combined with 'chronic pain', and 'questionnaire' or 'assessment' or 'self-report'. We considered all articles published since 1980 until the end date of our search, May 10th 2012. An initial set of 688 articles was identified.

2.2. Inclusion criteria

The following inclusion criteria were used:

- 1) The study was published as a peer-reviewed article in English language;
- 2) The study described a questionnaire assessing acceptance of chronic pain or chronic illness. Studies describing measures of coping were only included if acceptance was one of the subscales; and
- 3) Participants were child, adolescent or adult chronic pain sufferers.

2.3. Study selection

The abstracts of the studies as provided in the databases were screened for eligibility. A multiple-stage search strategy was developed, informed by guidance of the Cochrane Collaboration and previous systematic reviews undertaken^{10,11}. The identification of individual studies was limited to those papers being published since 1980. In case these studies used an instrument developed before 1980, this instrument was included. However, this was not the case for any instrument discussed in our review. From the initial set of 688 articles, 409 were recovered after removing duplicates and articles that were published before 1 January 1980. Further,

308 articles were removed because they did not fulfil the inclusion criteria (e.g., book chapters, conference papers, student or healthy populations). After screening the full-text articles, an additional number of 14 articles were excluded. These were mainly studies that included participants with recurrent pain⁵, studies that used (semi-) structured interview techniques²⁷, and studies that measured acceptance of stress but not chronic pain or chronic illness¹⁷. Additionally, the reference sections of the full-text articles were searched to identify other eligible studies or instruments for inclusion. Three additional studies were identified but excluded because they did not entail a measure of acceptance of chronic pain or chronic illness. The final number of studies included was 87. A detailed, schematic overview of the different stages in selecting the studies can be found in Figure 1.

< Figure 1 about here >

2.4. *Instrument selection*

Out of the 87 articles identified, 18 different instruments had been used. Five of those did not measure acceptance of specifically chronic pain or chronic illness, and were thus not included in the study (e.g., the Acceptance and Action Questionnaire-I)²⁰. There were some instruments that were adaptations of previous instruments used in the context of chronic pain. We included a modified version of an instrument as a separate measure when the number of items was changed, or when the content of one or more items was different. To further validate our search, a number of authors of articles describing the development of an acceptance instrument and key researchers whose work was of relevance to the topic of the study, were contacted and asked to identify other instruments suitable for inclusion in the study (see Figure 1). Twelve additional instruments were proposed of which none was included in the review because they did not meet inclusion criteria: instruments measuring acceptance of loss; instruments assessing coping in response to stress; and instruments assessing other constructs (i.e. mindfulness, cognitive defusion, values). The latter constructs may be conceptualized as related to acceptance, but are not considered to be the key constituents¹⁹. This left us with a final sample of 13 instruments. All instruments and the primary articles reporting their development were collected.

2.5. *Analysis, coding system and coding decisions*

First, note was taken of the full name of the instrument, acronym, basic reference, primary content, relevant subscale(s), and the number of times a measure was used. Second, we examined the sample for which the instruments initially were developed. In particular, we were interested in whether an instrument had been developed for individuals with a chronic illness or chronic pain. Third, we analyzed the content of instruments by coding the selected items of the instruments within the categories of our heuristic frame.

In deciding whether to include items, we looked at the initial description of the (sub)scales and whether its items were developed to assess acceptance features. Out of a total of 209 items across 13 instruments, 154 were included for subsequent analysis. Items were excluded from our analysis on a subscale level. We excluded subscales that were not designed to measure acceptance (i.e., the subscales helplessness and disease benefits of the Illness Cognition Questionnaire¹²; and the subscales confrontation and avoidance of the Medical Coping Modes Questionnaire¹³). However, in two specific cases, we excluded particular items of certain (sub)scales. First, we excluded items reflecting cognitive-behaviorally based responses of the Brief Pain Coping Inventory²⁸ and the Brief Pain Coping Inventory-II³⁶ because, in primary articles, it was stated explicitly that these items did not measure acceptance. Second, we excluded ten items of the Chronic Pain Acceptance Questionnaire-34 (Geiser, 1992). Those items have been consistently removed from total score calculation in all published papers.

For some instrument (sub)scales, no reference was made as to which specific items out of the total item pool reflected features of acceptance. This was the case for the Brief Pain Response Inventory (BPRI)³⁶, and the Psychological Inflexibility in Pain Scale (PIPS)⁵². Hence, we decided to include all items of those (sub)scales for further analysis. Details on item exclusion can be found in Table 1. Finally, of a total of 154 items, 42 items were duplicates. The final number of items included was 112.

We developed a standard coding protocol. This protocol was constructed and operationalized in an iterative process. First, we developed a heuristic frame that included all possible features of acceptance. We distributed this frame amongst senior experts working in the field of acceptance of chronic pain, and invited them to provide feedback. Hereafter, the frame was adapted and we developed a coding protocol. Subsequent versions of the heuristic frame and coding protocol were discussed among authors and research collaborators. We tested the interpretability

of our heuristic frame, by a priori creating sample items for each category of the coding protocol. These were piloted amongst a few research collaborators and led to a further adaptation of the categories. Discussion was repeated until a consensus amongst the authors was reached.

The final heuristic frame was built around two accounts that have been used to describe acceptance of chronic pain, i.e. Behavioral Analysis¹⁸ and self-regulatory theory^{1,4,22,38}. According to the behavioural analysis approach, acceptance has been defined as pain willingness (i.e., a willingness to remain in contact with and to actively experience particular private experiences) and the degree to which one engages in life activities despite pain^{32,51,53}. Using self-regulatory theory, acceptance is represented as a disengagement from unattainable goals and a reengagement into valued other goals^{1,4,22,38}. In general, these two approaches share the notion of engagement in activity. Although disengagement has been perceived of as conceptually similar to pain willingness²⁴, we decided to treat these as separate features based on differences in the original definitions. The three acceptance features obtained were: (1) *Disengagement from pain control*, i.e. items represent (factors related to) an attempt or a sequence of attempts to let go or give up the goal of pain control; (2) *Willingness to experience pain*, i.e. items represent (factors related to) a willingness to experience pain without the need to reduce, avoid, or otherwise change it³⁷; and (3) *Engagement in activities other than pain control*, i.e. items represent (factors related to) an attempt or a sequence of attempts to engage in other activities or goals than (the goal of) controlling pain. Below, we refer to these categories as 'disengagement from pain control', 'pain willingness', and 'engagement in activities other than pain control'. Of note is that we did not use strict definitions. Items may also reflect factors, such as attitudes, beliefs and behavior related to the features.

Our coding scheme consisted also of five additional categories. Three categories were rationally derived and represent aspects that are often described as related to acceptance but are not the same: (1) *Controlling pain*, i.e. items represent (factors related to) an attempt or a sequence of attempts to control pain; (2) *Pain costs*, i.e. items represent the hindrance or interference of pain on one's functioning and/or the costs of pain itself; and (3) *Pain benefits*, i.e. items represent the positive effect that pain may have on one's functioning and/or the benefits of pain itself. The two remaining categories were added in order to result in an exhaustive coding system:

(4) *Unclear*, i.e. items are ambiguous or unclear in content; and (5) *No fit*, i.e. the content of the item does not fit into one of the other categories.

In sum, the coding protocol consisted of eight categories. All eight categories and sample items per category are presented in the Appendix.

Two raters (EL and LC) independently coded the items. Items were coded with respect to their primary content, independent from reverse-coding transformations during the computation of (sub)scale scores. Raters were provided with the items, a coding sheet and a coding manual explaining the procedure. A soft clustering method was used, in which each specific item was allowed to be classified in several categories. For each item, raters distributed a total of ten points over the eight possible categories. For example, an item could be given a total of 10 points on the category “controlling pain” and 0 points on the other categories. Another item could be given 5 points on the category “engagement in activities other than pain control”, 5 points on the category “pain costs”, and 0 points on the remaining categories. In doing so, we avoided high rates of no fit-items as many items may contain elements of different categories. An additional advantage of soft clustering is that it produces scores that are more amenable to data-analytic strategies (e.g., factor analysis, multidimensional scaling) when compared to forced-choice procedures, which allow each item to be classified in only one specific category. Each rater coded all items.

3. Results

3.1. Instrument characteristics

Table 1 presents a summary of instruments included in the study, their authorship, description of general content, number of items, development population, and the number of times used.

Of the total of 13 instruments, ten were specifically developed for use in chronic pain populations and three for use in chronic illness populations (i.e., Illness Cognition Questionnaire (ICQ)¹², Acceptance of Illness Scale (AIS)¹⁴, and Medical Coping Modes Questionnaire (MCMQ)¹³). The latter three instruments had at least one psychometric evaluation in a sample of individuals with chronic pain.

The most frequently used instrument (in 57 of the 87 articles), is the 20-item Chronic Pain Acceptance Questionnaire (CPAQ-20)³². The original Chronic Pain Acceptance Questionnaire (CPAQ-34; Geiser, 1992), the adolescent version of the

Chronic Pain Acceptance Questionnaire (CPAQ-A)²⁹ and the 8-item Chronic Pain Acceptance Questionnaire (CPAQ-8)¹⁶ appeared to be less frequently used. Another frequently used instrument (in 10 out of the 87 articles) is the Illness Cognition Questionnaire (ICQ)¹². This instrument has been developed for use in individuals with chronic illness, and consists of three subscales, of which one measures acceptance. All other instruments were rarely used.

< Table 1 about here >

3.2. *Inter-rater agreement*

Agreement between raters was calculated by noting exact consensus between raters (i.e., an exact distribution pattern of a total of 10 points across eight categories). Summing exact consensus scores over all items yielded a general agreement score. We found exact agreement for 59 of the 112 items (53%). The main differences in coding were related to the extent to which items were judged to be “unclear” (15/112; 13.4%), the extent to which items were judged to have “no fit” (9/112; 8%), the choice between categorizing an item as either “controlling pain” or “pain costs” (9/112; 8%), and the choice between categorizing an item as either “disengagement from pain control” or “pain willingness” (8/112; 7%).

For each instrument, we identified the items that yielded the same scores for both raters, i.e. the exact distribution of points assigned across the eight categories. Whenever this was the case, a score of 1 was given. A score of 0 was given in case of any difference between the scores. We then summed the consensus scores of all items of a given instrument. Agreement percentages were calculated by weighting the sum with the total number of items of the respective instrument, multiplied by 100. Table 2 shows agreement percentages for each of the acceptance instruments. Seven out of ten instruments showed average to high agreement scores. The strongest agreement scores were found for the CPAQ-A, AIS, and AIS-P, followed by the CPAQ-20 . Both the original and 8-item version of the CPAQ showed moderate agreement. Moderate agreement was also found for the PASOL . For the remaining six instruments, i.e. BPCI, PIPS, MCMQ, BPRI, BPCI-II, and ICQ, agreement scores were below average.

Of note is that high “exact” agreement ratings are difficult to obtain with our procedure, as described above: raters have to code items in the exact same manner. Exact agreement calculations are very sensitive to difference between raters, even

the smallest. So, although reliability may seem low at first, this does not necessarily mean that there are major coding differences. Therefore, we also calculated whether the mean difference of points assigned across all categories differed between the two raters. We found no statistically significant difference between the raters on the total points assigned over categories, $F(7,216) = 1.16, p = .326$. Furthermore, we looked at whether the raters differed in points assigned for each category separately. For example, does rater one assigned a similar amount of points to “pain willingness” as rater two. We used Spearman correlations because our data were not on an interval level (there was non-continuous variation in points assigned to a category)¹⁵. Associations between raters were significantly positively associated for all eight categories, i.e. “disengagement from pain control”, $r_s = .43, p < .001$; “pain willingness”, $r_s = .58, p < .001$; “engagement in activities other than pain control”, $r_s = .74, p < .001$; “controlling pain”, $r_s = .80, p < .001$; “pain costs”, $r_s = .79, p < .001$; “pain benefits”, $r_s = .81, p < .001$; “unclear”, $r_s = .20, p = .032$; “no fit”, $r_s = .35, p < .001$. These analyses indicated that raters rank-ordered the items in a similar manner within each category. In order to reach consensus, difficulties and observed differences were discussed among raters. In subsequent analyses, we used the data set as obtained after consensus between the two raters.

3.3. Instrument content

For each item, we noted the distribution of points of each item over the eight main categories, i.e. three acceptance and five additional categories. For each instrument, we then summed all points of a specific category over all its items, and divided this by the total points assigned (number of items x 10). This score multiplied by 100 produced percentages reflecting the degree to which the items of an instrument covered each of the eight categories (see Table 2).

Acceptance. Overall, we found that most instruments were classified for a significant part in the acceptance categories of our heuristic frame. The highest percentages were noted for the BPCI (60%), CPAQ-A (55%), and CPAQ-20 (53.5%). Low to very low percentages were noted for the BPCI-II, MCMQ, AIS, AIS-P, and PIPS. The only two instruments that had equal high, albeit moderate percentages of items within the three acceptance features, i.e. “disengagement from pain control”, “pain willingness”, and “engagement in activities other than pain control”, were the original CPAQ and the PASOL. A significant amount of instruments had moderate to

high percentage of items within the category “engagement in activities other than pain control”. This was especially the case for the CPAQ-20, CPAQ-A and CPAQ-8. Noteworthy, the categories “disengagement from pain control” and “pain willingness” were underrepresented across instruments.

Additional categories. Items of a considerable amount of instruments were to a large extent classified within the category “controlling pain” (e.g., CPAQ-34, CPAQ-20, CPAQ-A, CPAQ-8, BPCI, BPCI-II, BPRI, PASOL, and PIPS). All items of one instrument (AIS-P) and almost all items of two instruments (AIS, MCMQ) could not be classified within the acceptance categories. Items of the AIS and AIS-P were to a large extent classified within “pain costs” (e.g. “Because of my illness, I miss the things I like to do best” (AIS); or “My pain makes me feel useless at times” (AIS-P)). Also the PIPS was classified to a great extent within “pain costs” (35%). Items of the MCMQ were mainly classified within “no fit” (e.g., “How often do you feel that you don’t care what happens to you?” (MCMQ)). An instrument that was strongly represented within the category “unclear” was the ICQ (50%) (e.g., “I can handle the problems related to my illness”, or “I can cope effectively with my illness”).

< Table 2 about here >

3.4. *Multidimensional Scaling*

The Multidimensional Scaling Solution. Multidimensional Scaling (MDS) was used to identify underlying dimensions of the obtained data. MDS represents the items in a geometrical configuration of points in such a manner that highly similar items are placed close to each other, and items with low similarity are placed at a greater distance from each other. We used the isoMDS command available in R³⁹ which implements one form of non-metric multidimensional scaling⁴⁷. To avoid numerical problems with identical cases, a small amount of fuzz (normally distributed noise with standard deviation equal to 0.001) was added to the data before the analysis. The MDS-analyses produced solutions in one to ten dimensions. The scree plot (see Figure 2) showed a stress elbow at two dimensions, with an observed value of 0.25, accounting for 75% of the variance in the obtained data set. Figure 3 situates each item within the two-dimensional representation of the MDS-solution, as determined by the coordinates in each dimension. Theoretically, the stress elbow indicates that the third dimension does not add any significant change to the explanatory power of the data. Conversely, according to the goodness-of-fit criteria proposed by Kruskal²⁵,

our obtained solution would poorly fit the data since the stress value exceeds 0.20. As such, a three-dimensional solution would fit our data better, with an observed value of 0.14, accounting for 86% of the variance. However, the utility of this, rather rough guideline has been questioned over time². Kruskal and Wish²⁶ argued that the interpretability of the dimensional solution is an equal or even more important decision criterion in MDS. As dimensions increase, solutions tend to be more difficult to comprehend. Altogether, because our primary aim was to reveal clear scientific interpretable value out of the data, the two-dimensional solution was decided on in the present data set.

< Figure 2 about here >

< Figure 3 about here >

Labeling. Labels were assigned to the obtained dimensions by examining the items on both ends of the continuum.

For the first dimension, items on one end point were: “Although things have changed, I am living a normal life despite my chronic pain” (CPAQ-34, CPAQ-20, CPAQ-8); “When my pain increases, I can still do things I have to do” (CPAQ-A); and “Kept doing what I was doing without letting pain stop me” (BPCI, BPCI-II, BPRI). Items on the other end of the continuum were: “My illness makes me a burden on family and friends” (AIS); “I think people are often uncomfortable around me because of my pain” (AIS-P); and “It is not me that controls my life, it is my pain” (PIPS). Items then seem to reflect a dimension from ‘engagement in activities despite pain’ towards ‘pain interference, or pain costs’.

For the second dimension, one endpoint consisted of the items: “Accepted the pain and realized I did not need to change it” (BPCI); “It’s OK to experience pain” (CPAQ-34, CPAQ-20, CPAQ-8, CPAQ-A); and “I have learned to accept the limitations imposed by my illness” (ICQ). On the other side, the following items were situated: “Keeping my pain under control is the most important thing whenever I am doing something” (CPAQ-A); “Sacrificed something important to control my pain” (BPRI); and “I would do anything to be without pain” (PASOL). Items seem to reflect a dimension ranging from ‘pain willingness’ to ‘controlling pain’.

4. Discussion

We investigated which features of acceptance are reflected in instruments that assess acceptance of chronic pain. We found a diversity of acceptance instruments available for use. Of importance to this study was the extent to which items were classified within categories that we identified as key constituents of acceptance (i.e., “disengagement from pain control”, “pain willingness”, and “engagement in activities other than pain control”).

The extent to which the different features of acceptance are represented in instruments varied. The original version of the CPAQ and PASOL had items on all acceptance features. Across instruments, items reflecting the “engagement in activities other than pain control” were best represented. Least represented were items reflecting the “disengagement from pain control” and the “pain willingness”. Of note, some instruments had many items on the additional categories that do not represent acceptance. Items reflecting “controlling pain” were overrepresented in instruments. The ICQ had many items that were considered “unclear” in content. The PIPS and AIS had many items that were indicative of “pain costs”.

Using multidimensional scaling, we identified two dimensions that capture the content of a total sum of 112 items across the instruments. The endpoint of one dimension represented “pain willingness”. This acceptance feature is akin to the original definition of acceptance as provided by Hayes and colleagues: ‘a willingness to experience pain without the need to control, avoid, or otherwise change it’¹⁸. The endpoint of the second dimension represented “engagement in activities other than pain control”. In later writings, Hayes and colleagues^{19,21} stated that willingness is a necessary prerequisite for engagement in valued-based activities. Over time, both features have become core elements of how acceptance of chronic pain is defined, both in scientific literature³² as within cultural understanding⁴². Also, other accounts mention “disengagement from pain control” as a key feature of acceptance^{9,12,43,45}. However, this acceptance feature did not emerge as a distinct component that was assessed among the instruments.

Although our data showed that “engagement in activities other than pain control” and “pain willingness” are two key features of the items that measure acceptance, not many instruments appeared to simultaneously assess these features. Some instruments did not cover any of these two features (i.e., AIS-P³⁹, MCMQ¹³, and PIPS⁵²). Admittedly, the PIPS was not designed to only measure acceptance⁵². Nevertheless, no single item of that instrument reflected acceptance. One instrument

did not have items that represented the willingness feature of acceptance (i.e., CPAQ-8). Noteworthy, our results indicated that in the process of psychometric validation the content of the CPAQ has changed over time. The original instrument is a 34-item version developed by Geiser in 1992. Using principal component analysis, McCracken and colleagues³⁰ found evidence for a three-factor structure consisting of: (1) Engaging in normal life activities; (2) Recognizing the chronicity of pain; and (3) Needing to avoid or control pain. Items that belonged to a factor labeled “believing that controlling thoughts controls pain”, were found not to fit within the found structure, and were eliminated from subscale calculation³⁰. Later research favored two instead of three factors, i.e. engagement in activities despite pain and willingness to experience pain³². In an attempt to increase time efficiency, Fish and colleagues¹⁶ further reduced the item pool into a compact 8-item version, consisting of four items for both the willingness and engagement component. In this process of modification and adaptation, items representing “pain willingness” have become underrepresented. We may ponder on the idea whether these modifications still measure acceptance, or, at least, the same notion of acceptance.

A further finding of our study was that many items of acceptance instruments often reflect the reverse of acceptance. This is well illustrated by our multidimensional scaling, which revealed two dimensions. One dimension consisted of “pain willingness” and “controlling pain” as endpoints. The other dimension consisted of “engagement in activities other than pain control” and “pain costs” as endpoints. Our study confirms that “pain willingness” is measured in many instruments (e.g., CPAQ-34, CPAQ-20, CPAQ-A, CPAQ-8, BPCI-II, and BPRI) by reverse-coding items that represent attempts to control pain. At the same time, “engagement in activities other than pain control” seems to be sometimes measured by items that represent the counterpart of the extent to which pain interferes with activities (pain costs, or disability; e.g., CPAQ-34, CPAQ-20, CPAQ-A, CPAQ-8). Some problems may emerge from this approach. First, it may distract clinicians and researchers from the actual construct that is at stake. For example, attempts to avoid or control pain, but not willingness to experience pain, will easily be framed within a fear-avoidance model^{6,50}. Second, it may lead to spurious correlations with particular outcomes. Although it may go unnoticed, it is not surprising to find negative correlations between pain willingness and avoidance of pain. Also problematic is the idea that negative correlations between engagement and disability may become spurious. Some of the

items of acceptance instruments may simply be the opposite of disability. Consequently, correlations between measures of acceptance and disability obtained in studies may be inflated.

This study has some implications. First, we have to be cautious in using instruments for clinical and research purposes. Some questionnaires do not, or only to a small degree, assess key constituents of acceptance (e.g., AIS, AIS-P, MCMQ). Second, we should consider relabeling some (sub)scales in a manner that matches the content of their items. As long as the majority of items of a “pain willingness” subscale are reverse-coded, we suggest this scale to be labeled “pain control”. The situation may change when the percentage of reverse-scoring items substantially drops. Third, according to behavioral analysis¹⁸, acceptance has been described to consist of both a willingness to experience pain and the engagement in activities despite pain. The idea that “engagement in activities other than pain control” is conditional upon “pain willingness”, as argued by Hayes¹⁹, is currently not addressed in instruments. Simply summing the scores of these two subscales does not capture this conditionality. Other scoring rules should be considered and developed. A possibility is the use of multiplicative rules. Fourth, there is a need to reflect on how acceptance is best measured. It may well be that we should go back one step in order to develop adequate measures. A core set of items that captures well the different features of acceptance may be selected across instruments. The items of the original version of the CPAQ (Geiser, 1992) still remain an excellent starting point. Items from other instruments may be added. Good candidates are items representing “disengagement from pain control” and/or “pain willingness” from the PASOL⁸, and items representing “pain willingness” of the BPCI²⁸ and the BPRI³⁴.

There are some limitations to this study. First, we may have ignored instruments of potential value in measuring acceptance features that have not been used in individuals with chronic pain. For example, future research may investigate the value of the Goal Adjustment Scale⁵⁴, a generic measure of goal disengagement and reengagement capabilities. Second, we did not include instruments that use other than a questionnaire format. One example is the Clinical Pain Acceptance Q-Sort²⁷, a semi-structured interviewing method aimed at assessing acceptance in daily clinical practice. Third, our heuristic frame to analyze item content is coherent and exhaustive, but probably others are possible. Indeed, there was a substantial number of items that were coded as “unclear” or “no fit”. This may be indicative of other

notions of acceptance. Fourth, future research may include individuals with chronic pain as they may interpret items differently. Fifth, we only analyzed the content validity. We are well aware of the fact that other psychometric properties are equally important⁴⁴. We advocate, however, that the investigation of construct and predictive validity only makes sense for instruments with a sound content validity. Of further note, the problems identified with content validity may not be specific for the measurement of acceptance, but may also be relevant for the measurement of other constructs in psychology³.

To conclude, this article investigated the content validity of instruments assessing acceptance of chronic pain. Findings suggest that instruments do not often represent what is considered as acceptance. The meaning of acceptance differs between different instruments and between different versions of the same instrument. Also, some acceptance items have considerable overlap with outcome measures. We recommend that further research starts with showing the content validity of self-report measures, before addressing other psychometric properties such as construct and predictive validity. This issue is critical if we are to advance theory and research.

Acknowledgments

The authors thank Annabelle Casier and Marieke Dewitte for valuable assistance in developing the coding protocol. We are also grateful to various experts who were willing to provide feedback on the inclusion of instruments for the study: Lance McCracken, Paul Karoly, Chris Eccleston, Stephen Morley, Andrea Evers, Kevin Vowles, and Johan Vlaeyen.

Disclosures

No funding sources were provided. The authors have no conflicts of interest to declare.

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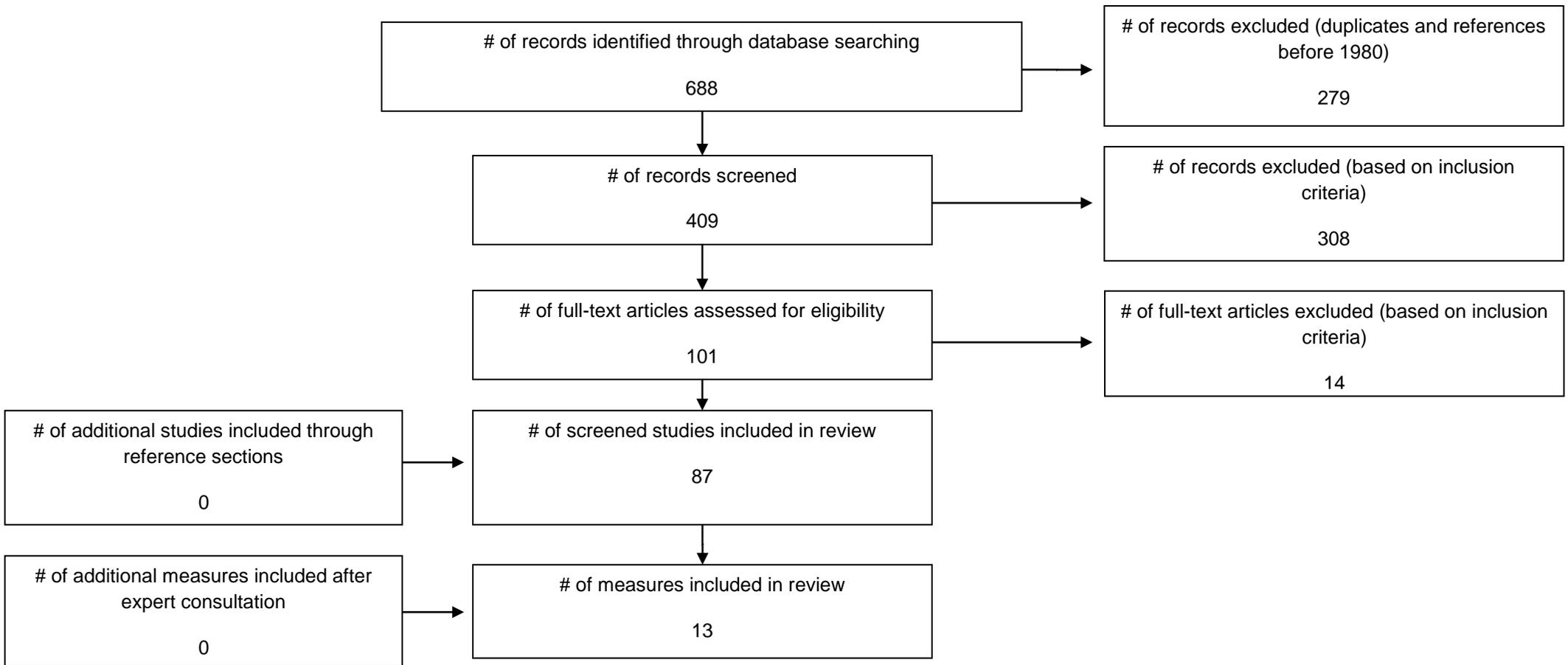


Figure 1. Flow of information through the different phases of the search strategy.

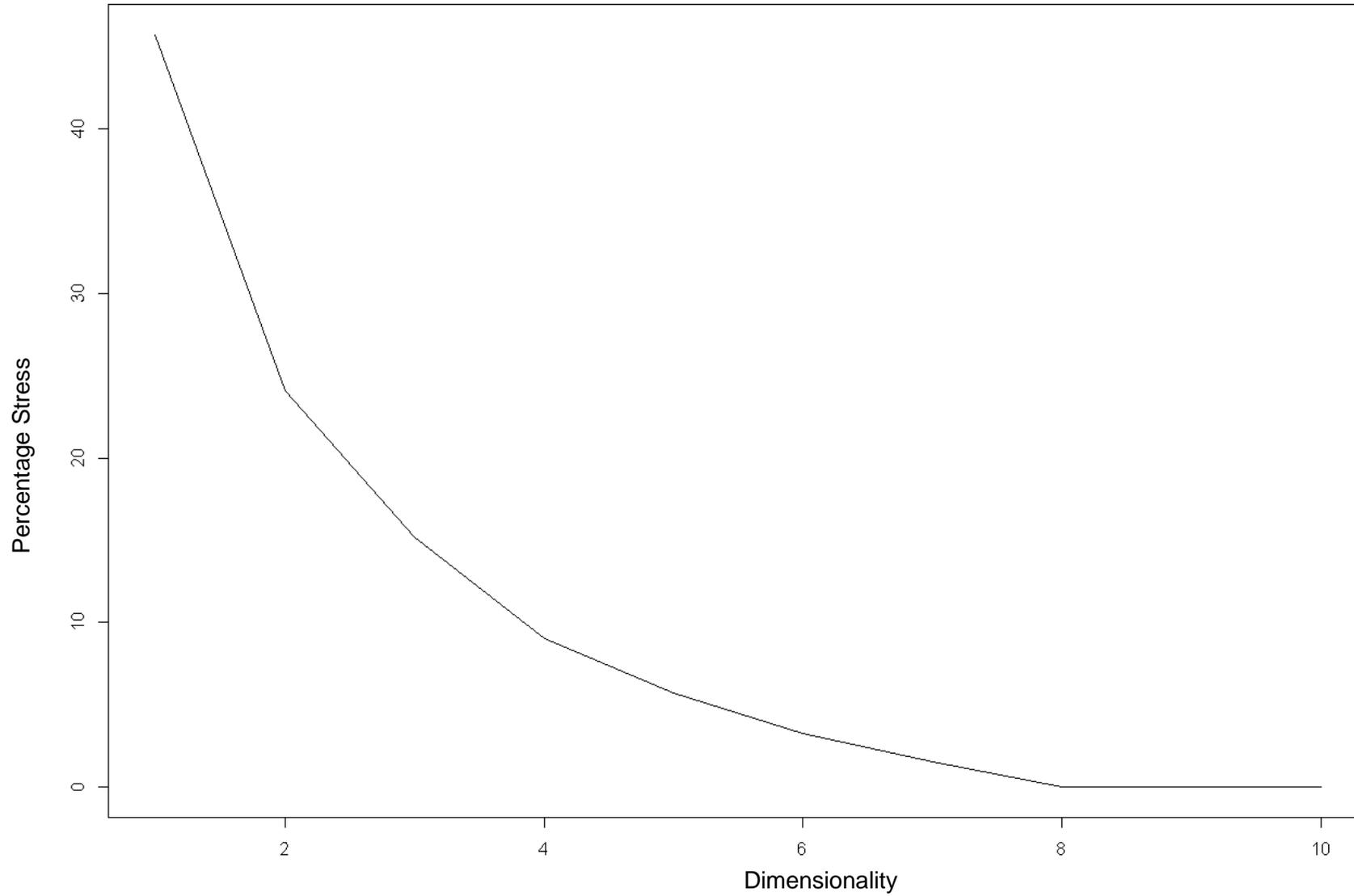


Figure 2. A scree plot of the multidimensional scaling solution.

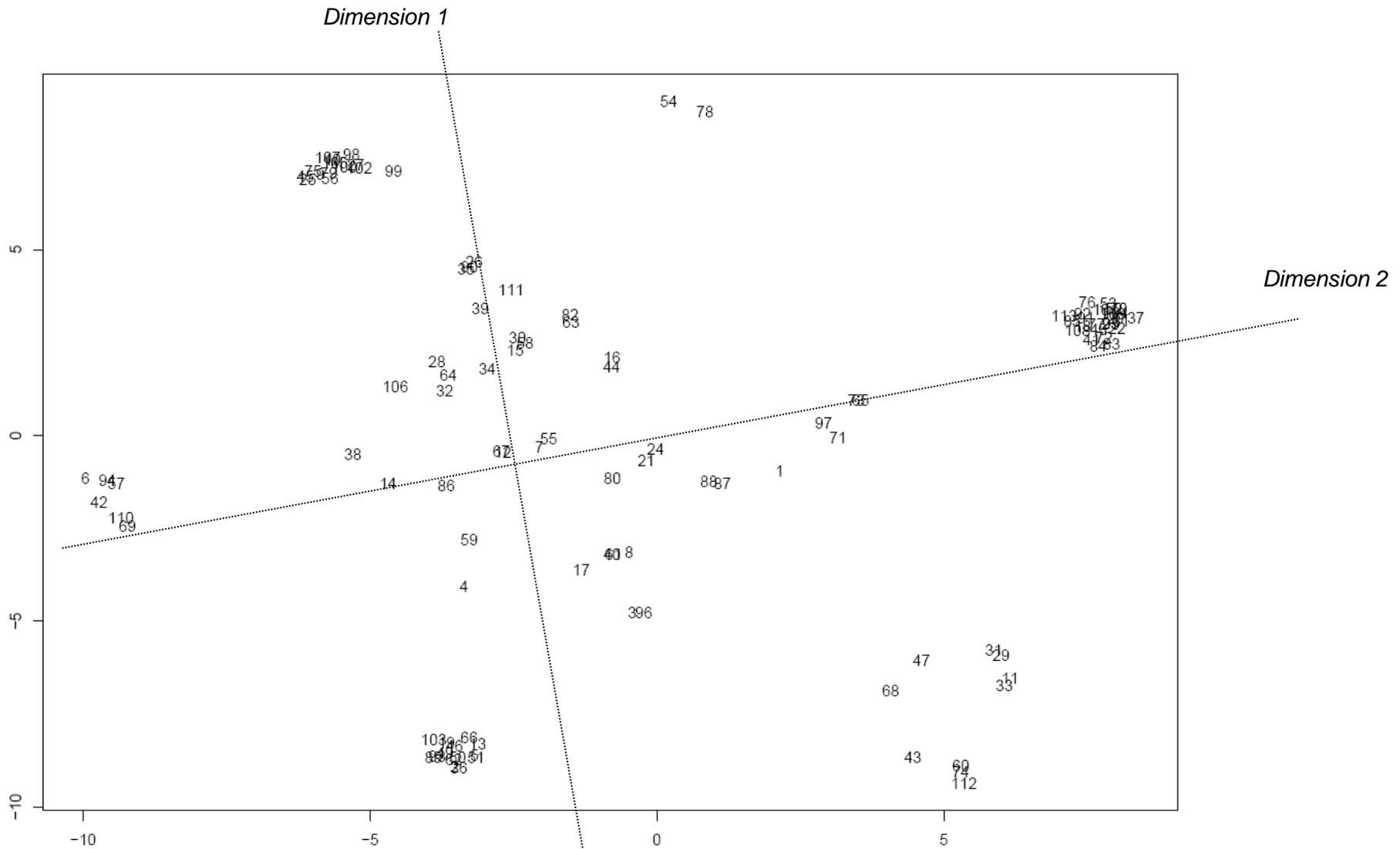


Figure 3. A two-dimensional scaling solution. Dimension 1 reached from the endpoint 'engagement in activities other than pain control' (upper part of the figure) to the endpoint 'pain costs' (lower part of the figure). Dimension 2 reached from the endpoint 'pain willingness' (left part of the figure) to the endpoint 'controlling pain' (right part of the figure).

Table 1. Details of acceptance measures used in chronic pain populations

Name	Acronym	Basic Reference	Description	Factors (Number of items)	Development population	Times used
Chronic Pain Acceptance Questionnaire	CPAQ-34	Geiser, 1992	Measures acceptance of pain	Total score (24/34) ^a	Chronic pain population	13
<i>Chronic Pain Acceptance Questionnaire</i>	CPAQ-20	McCracken et al., 2004	Revised version of original CPAQ that measures acceptance of pain	2 Activity engagement (11) Pain willingness(9) Total score (20)	Chronic pain population	57
<i>Adolescent Version of the Chronic Pain Acceptance Questionnaire</i>	CPAQ-A	McCracken et al., 2010	Adolescent version of the CPAQ that measures acceptance of pain	2 Activity engagement (11) Pain willingness (9) Total score (20)	Adolescent chronic pain population	5
<i>Short form version of the Chronic Pain Acceptance Questionnaire</i>	CPAQ-8	Fish et al., 2010	Revised version of the CPAQ that measures acceptance of pain	2 Activity engagement (4) Pain willingness (4) Total score (8)	Chronic pain population	1

Table 1. *Continued*

Name	Acronym	Basic Reference	Description	Factors (Number of items)	Development population	Times used
Illness Cognition Questionnaire	ICQ	Evers et al., 2001	Measures how people give meaning to chronic diseases by means of three generic illness cognitions among which one of these is 'acceptance', i.e. the way to diminish the aversive meaning of the illness	3 Helplessness (6) Acceptance (6) Disease benefits (6)	Chronic illness population	10
Acceptance of Illness Scale	AIS	Felton & Revenson, 1984	Measures acceptance of illness	1 Total score (8)	Chronic illness population	2
<i>Acceptance of Illness Scale, adapted to pain</i>	AIS-P	Rankin & Holtum, 2003	Measures respondents' success in feeling acceptant and valuable in spite of the problems and losses occasioned by the painful condition	1 Total score (8)	Chronic pain population	2
Brief Pain Coping Inventory	BPCI	McCracken et al., 2005	Measures a range of self-regulatory responses to pain including acceptance based responses and cognitive-behaviourally based responses	Analysed on item-level (5/18) (4,11,16,2,17)	Chronic pain population	2

Table 1. *Continued*

Name	Acronym	Basic Reference	Description	Factors (Number of items)	Development population	Times used
<i>Brief Pain Coping Inventory -2</i>	BPCI-II	McCracken et al., 2007	Measures a range of self-regulatory responses to pain including acceptance based responses and cognitive-behaviourally based responses	2 Pain Management Strategies (8) Psychological Flexibility (6/11) ^b	Chronic pain population	1
<i>Brief Pain Response Inventory</i>	BPRI	McCracken et al., 2010	Measures psychological flexibility in response to pain	2 Flexible Action (8) Willing Engagement (7) Total score (15)	Chronic pain population	1
Psychological Inflexibility in Pain Scale	PIPS	Wicksell et al., 2008	Measures psychological inflexibility in response to pain	2 Avoidance (10) Cognitive Fusion (6) Total score: 16 ^c	Chronic pain population	2
Pain Solutions Questionnaire	PASOL	De Vlieger et al., 2006	Measures assimilative (efforts at changing or solving pain) and accommodative (accepting that pain cannot be solved, and changing life goals) responses to problems associated with pain	4 ^d Solving Pain (4) Meaningfulness of Life despite Pain (5) Acceptance of the Insolubility of Pain(3) Belief in a Solution (2) Total score (12)	Chronic pain population	3

Table 1. *Continued*

Name	Acronym	Basic Reference	Description	Factors (Number of items)	Development population	Times used
Medical Coping Modes Questionnaire	MCMQ	Feifel et al., 1987	Measures the coping responses of individuals facing "serious chronic illness"	3 Confrontation (8) Avoidance (7) Acceptance-resignation(4)	Chronic illness population	1

Note. Bold numbers represent items that are included in the analysis.

^aAccording to the original scoring proposed by Geiser (1992), 24 items out of the total item pool of 34 items are used to calculate a total acceptance score. As such, ten items were systematically excluded from scale calculation (items 8, 11, 13, 15, 18, 21, 25, 26, 29 and 33). McCracken and colleagues³⁰ subsequently examined the factor structure of the original 34 -item pool. They found evidence for a three-factor structure constituting of the subscales (1) Engaging in normal life activities (10 items); (2) Recognizing that pain may not change (4 items); and (3) Needing to avoid or control pain (8 items). A fourth factor, 'Believing that controlling thoughts controls pain' (5 items), was identified. These items were found to be divergent from the overall construct of acceptance and were excluded from scale calculation. The scoring procedure described by Geiser (1992) did not include these five items either. The item selection and scoring procedure proposed by McCracken and colleagues³⁰ nearly resembled the original one proposed by Geiser (1992). While the original scoring included 24 of the 34 items, the one proposed by McCracken and colleagues included 21 of the 24 selected by Geiser and one item (item 15) that was not originally selected. The total number of items included by the scoring of McCracken and colleagues was 22 (excluding the 5 items belonging to the factor 'Believing that controlling thoughts controls pain'. Most published studies reporting on the use of the 34-item CPAQ version used the original scoring by Geiser (1992). Therefore, in our review, we opted to include those items, i.e. 24, that are most commonly used for total score calculation.

^bIn the original article³⁶, PCA showed a solution with 3 factors that were labeled "Pain Management Strategies", "Pain Acceptance" and "Awareness and Values-Based Action". The latter factors were subsequently combined and labeled "Psychological Flexibility". Because of the purpose of this study, we will specifically focus upon the items that originally belonged to the factor "Pain Acceptance", i.e. items 2, 4, 7, 11, 17 and 24.

^cSince items were originally generated out of a pool of items (36) reflecting a mix of avoidance, cognitive fusion, acceptance, and values orientation, we decided to include all items in the analysis.

^dAccording to Crombez and colleagues⁷, each of the subscales can be used in isolation, or an assimilative compound score can be calculated by summing the scores of the 'Solving Pain' subscale and the reverse scores of both the 'Meaningfulness of Life Despite Pain' and 'Acceptance of the Insolubility of Pain' subscales. As such, the 'Solving Pain' subscale, as a correlate of control-based responses (assimilation) might entail some similarities with an unwillingness to experience pain, reversed to the acceptance-related responses (accommodation) of the other two subscales. Therefore, we opted to include the items of the 'Solving Pain' subscale into our analyses. The 'Belief in a Solution' might be perceived of as a determinant of an individual's assimilative responses to pain. Therefore, we chose to include those items as well.

Table 2. Number of items included for each instrument, and percentages representing inter-rater agreement and category loadings for each instrument

Instrument	N	Acceptance categories			Additional categories					Inter-rater agreement
		disengagement from pain control	pain willingness	engagement in activities other than pain control	controlling pain	pain costs	pain benefits	unclear	no fit	
CPAQ-34	24	14.58%	14.58%	30.83%	25%	3.33%	0%	7.08%	4.6%	62.5%
CPAQ-20	20	6.5%	5%	42%	35%	4%	0%	3.5%	4%	70%
CPAQ-A	20	3.5%	6%	45.5%	35%	4%	0%	2%	4%	75%
CPAQ-8	8	0%	0%	46.25%	37.5%	2.5%	0%	3.75%	10%	62.5%
ICQ	6	0%	43.33%	6.67%	0%	0%	0%	50%	0%	16.67%
AIS	8	0%	2.5%	0%	0%	72.5%	0%	0%	25%	75%
AIS-P	8	0%	0%	0%	0%	70%	0%	5%	25%	75%
BPCI	5	0%	28%	32%	30%	0%	0%	10%	0%	40%
BPCI-II ^a	6	0%	5%	28.33%	38.33%	0%	13.33%	15%	0%	16.67%
BPRI ^a	15	3.33%	24%	22.67%	22%	8.67%	4.67%	14.67%	0%	20%
PIPS	16	0%	0%	0%	44.38%	35%	0%	15.62%	5%	37.5%
PASOL	14	15.71%	10.71%	19.29%	42.86%	0%	0%	11.43%	0%	50%
MCMQ	4	20%	0%	0%	0%	17.5%	0%	7.5%	55%	25%

Note. CPAQ-34 = Chronic Pain Acceptance Questionnaire -34-item version; CPAQ-20 = Chronic Pain Acceptance Questionnaire - 20-item version; CPAQ-A = Chronic Pain Acceptance Questionnaire - Adolescent version; CPAQ-8 = Chronic Pain Acceptance Questionnaire - 8-item version; ICQ = Illness Cognition Questionnaire; AIS = Acceptance of Illness Scale; AIS-P = Acceptance of Illness Scale – adapted for pain; BPCI = Brief Pain Coping Inventory I; BPCI-II = Brief Pain Coping Inventory II; BPRI = Brief Pain Response Inventory; PIPS = Psychological Inflexibility for Pain Scale; PASOL = Pain Solutions Questionnaire; MCMQ = Medical Coping Modes Questionnaire.
^aSum of percentages deviates from 100% due to rounding up or off of individual percentages.

Appendix. Coding categories and their sample items

A. Acceptance categories

1. Disengagement from pain control

Category description: Item represents (factors related to) an attempt or a sequence of attempts to let go or give up pain control

Sample item: I think it's useless to try to control my pain

2. Pain willingness

Category description: Item represents (factors related to) a willingness to experience pain without the need to reduce, avoid, or otherwise change it

Sample item: I accept my pain as it is

3. Engagement in activities other than pain control

Category description: Item represents (factors related to) an attempt or a sequence of attempts to engage in other goals than the goal of controlling pain.

Sample item: There are many activities I do when I feel pain

B. Additional categories

1. Controlling pain

Category description: Item represents (factors related to) an attempt or a sequence of attempts to control pain

Sample item: I would do everything to control my pain

2. Pain costs

Category description: Item represents a negative relationship between pain and other goals and/or the costs of pain itself

Sample item: My pain causes me a lot of frustration

3. Pain benefits

Category description: Item represents a positive relationship between pain and other goals and/or the benefits of pain itself

Sample item: Because of my pain, I value more in life

4. Unclear

Category description: It is unclear what the item content is about

5. No fit

Category description: Item does not fit into one of the categories above