PSYCHOSOCIAL STRESSORS IN THE
PAIN EXPERIENCE

The Development of a Pain-Validation Scale

by

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Doctor of Philosophy.

Discipline of Psychology
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Author Declaration

I declare that this thesis is my own account of my research and contains as its main content work which has not previously been submitted for a degree at any tertiary institution.

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Melinda Nicola

Statement of Contributions

Within the main thesis are two manuscripts, appearing in Chapters 2 and 3, prepared for submission to peer-reviewed journals. The doctoral candidate collected all data and prepared the draft manuscripts. Supervisors contributed by way of critical review, advice on analysis, and responses to peer review of manuscripts where required. Dr Helen Correia also acted, specifically, as second reviewer to confirm uniformity of coding in the thematic analysis paper. All authors give permission for inclusion of the manuscripts within this thesis.

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Abstract

Many people with chronic pain report distress at being disbelieved, judged, or criticized with regards to their pain. Pain-invalidation may be inflicted by the self, by immediate others in one’s social network, or come from healthcare professionals. At the other extreme, over-validation may also be problematic, with excessive interference by well-meaning others potentially limiting functional rehabilitation. Given the potential for psychological and physiological detriment of pain-invalidation or over-validation, this research was designed to operationalize the construct of pain-validation and enable its measurement. Study 1 involved a thematic analysis of pain narratives, to identify pain-validation themes, and to facilitate the creation of an item pool best representing the construct. Terms related to pain-validation, invalidation and over-validation were employed in a systematic search strategy used to extract relevant articles from 5 databases. Examination of 431 peer-reviewed articles, followed by a thematic analysis, gave rise to five major themes including: Not Being Believed, Lack of Compassion, Lack of Understanding / Awareness, Critical Judgement, and Feeling Stigmatized. The outcomes from themes identified in Study 1 informed the generation of items for Study 2: Development of a Pain-Validation Scale. Six subject matter experts and 10 adults from the general community provided feedback on a broad pool of items, regarding construct relevance, item wording, and suitability of the response scale. A pain-validation survey was then distributed to 302 participants aged between 18-65 years having chronic pain, recruited via the online crowdsourcing platform, Prolific. Exploratory factor analysis was performed on the data collected, and guided decisions on reduction of the item list to 36 items. The resulting proposed Pain-Validation Scale (P-VS)
consisted of 4 subscales: *Invalidation by the Self, Invalidation by Immediate Others, Invalidation by Healthcare Professionals*, and *Over-validation*. Study 3 involved the distribution of a second survey, again using Prolific to recruit 308 participants aged between 18 – 65 years with chronic pain. Confirmatory factor analysis was performed on the resulting data, and structural equation modelling was used to determine a model of best fit for the measure. Through the consideration of construct representation, internal consistency, and statistical ‘best fit’, the 24-item model was deemed the most appropriate model of pain-validation. The 4 subscales were retained, each represented by 6 items. Part 2 of Study 3 involved analyses designed to demonstrate validity and reliability of the Pain-Validation Scale. High internal consistencies were found for all subscales, and test-retest outcomes at 1 month showed acceptable stability of subscale scores of the P-VS instrument. To further support the validity of the P-VS, regression analyses were conducted examining the relationship of each pain-validation domain with related theoretical constructs including self-compassion, perfectionism, fear of negative evaluation, self-efficacy, illness cognitions, and pain-catastrophization. Additionally, hierarchical linear regressions allowed for examination of covariates *Age, Gender, and Pain Frequency*, and showed that *Pain Frequency* was an important variable contributing to pain-validation outcomes. Having demonstrated evidence of validity and reliability, the P-VS may be appropriate for use by clinicians and therapists for clients with chronic pain. The P-VS may serve as a useful tool with the capacity to detect adverse levels of pain-invalidation or over-validation in specific domains, such that these issues can be addressed in the early stages of pain-management interventions.
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Author note: Papers submitted to peer-reviewed journals are embedded within the written chapters, accounting for a degree of repetition within the thesis, and some inconsistencies in referencing style and (United States / United Kingdom English) spelling.
### Abbreviations

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
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<tbody>
<tr>
<td>ADF</td>
<td>Asymptotically Distribution-Free (method)</td>
</tr>
<tr>
<td>APS-R</td>
<td>Almost Perfect Scale-Revised</td>
</tr>
<tr>
<td>AMOS</td>
<td>Analysis of a Moment Structures</td>
</tr>
<tr>
<td>ANOVA</td>
<td>Analysis of Variance</td>
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<tr>
<td>BFNE</td>
<td>Brief Fear of Negative Evaluation</td>
</tr>
<tr>
<td>CF</td>
<td>Common Factors</td>
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<tr>
<td>CFA</td>
<td>Confirmatory Factor Analysis</td>
</tr>
<tr>
<td>CFI</td>
<td>Comparative Fit Index</td>
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<tr>
<td>COR</td>
<td>Conservation of Resources</td>
</tr>
<tr>
<td>EFA</td>
<td>Exploratory Factor Analysis</td>
</tr>
<tr>
<td>FAM</td>
<td>Fear Avoidance Model</td>
</tr>
<tr>
<td>HCP</td>
<td>Healthcare Provider</td>
</tr>
<tr>
<td>HIV</td>
<td>Human Immunodeficiency Virus</td>
</tr>
<tr>
<td>HPA</td>
<td>Hypothalamic Pituitary Adrenal (axis)</td>
</tr>
<tr>
<td>ICS</td>
<td>Illness Cognitions Scale</td>
</tr>
<tr>
<td>KMO</td>
<td>Kaiser-Meyer-Olkin (test)</td>
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<tr>
<td>MI</td>
<td>Modification Index</td>
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<tr>
<td>ML</td>
<td>Maximum Likelihood (method)</td>
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<tr>
<td>PCA</td>
<td>Principal Components Analysis</td>
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<td>PCS</td>
<td>Pain Catastrophizing Scale</td>
</tr>
<tr>
<td>PSEQ</td>
<td>Pain Self-Efficacy Questionnaire</td>
</tr>
<tr>
<td>P-VS</td>
<td>Pain-Validation Scale</td>
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<tr>
<td>RMSEA</td>
<td>Root Mean Square Error of Approximation</td>
</tr>
<tr>
<td>SCS</td>
<td>Self-Compassion Scale</td>
</tr>
<tr>
<td>SCS-SF</td>
<td>Self-Compassion Scale-Short Form</td>
</tr>
<tr>
<td>SEM</td>
<td>Structural Equation Modelling</td>
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<tr>
<td>SME</td>
<td>Subject Matter Expert</td>
</tr>
<tr>
<td>SPSS</td>
<td>Statistical Package for the Social Sciences</td>
</tr>
<tr>
<td>SRMR</td>
<td>Standardized Root Mean Residual</td>
</tr>
<tr>
<td>SRC</td>
<td>Standardized Residual Covariances</td>
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<tr>
<td>3*I</td>
<td>Illness Invalidation Inventory</td>
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Pain is a subjective experience that may signal a change in sensory stimuli, initiated by either top-down or bottom-up processes; and is influenced by numerous environmental and psychological factors including attention, prior experience, interpreted meaning, and cultural factors (Melzack & Katz, 2013). Pain is believed to be evolutionarily adaptive as a signal to the individual, warning of potential danger, and encouraging life-preserving changes in behaviour (Melzack & Katz, 2013). Chronic pain, however, defined as consistent symptoms that last beyond 3 months (Treede et al., 2019), often becomes detrimental, particularly if the reason for the pain remains unknown.

Chronic pain can convey substantial limitations to the afflicted individual’s working and social life (Goldberg & McGee, 2011). Specifically, it interferes with immune and cognitive functioning, while also causing disruptions to mood, sleep patterns, eating habits, and stress responses (Baliki & Apkarian, 2015). As such, ongoing pain presents a burden to the sufferer, family members, health care systems, and the wider economy (Henschke, Kamper, & Maher, 2015). The indistinct and changeable nature of pain makes the prevalence of chronic pain difficult to report statistically, though broad estimates indicate that it is experienced by approximately 15% of the worldwide population (Baliki & Apkarian, 2015). In Australia, as at 2018, chronic pain was reported to incur a cost of $139 billion dollars, with 1 in 5 people aged 45 years or older having chronic pain (Australian Institute of Health and Welfare, 2020). With such a vast
number of people enduring pain, and given its serious economic impact, it is in
the community’s strong interest to unmask the central contributing factors.

**Models and Mechanisms of Pain**

Early models of the 20th century described pain as derived from stimulation
of sensory nerves, with signals travelling via hard-wired pain pathways in the
spinal cord to the brain (Melzack & Katz, 2013). With the introduction of
Melzack and Wall’s (1965) gate control theory, scientists’ understanding of pain
later evolved to incorporate specific processing pathways within the spinal cord
and brain. Modern theories of pain, however, have arisen more recently to
account for the occurrence of chronic conditions such as complex regional pain,
phantom limb pain, and fibromyalgia to name a few, that are experienced long
after the initial stimulus or tissue damage has passed (Kuner, 2010). Other
chronic pain conditions with causes that can be difficult to detect medically
include migraine, irritable bowel syndrome, and low back pain.

One such theory that may explain chronic pain phenomena is the
neuromatrix theory (Melzack, 2001) which postulates that pain is a
multidimensional phenomenon that may result not only from sensory input or
injurious stimuli but also from the influences of affective states and cognitions.
The neuromatrix is purported to comprise neural loops ranging throughout the
body and brain, with a structure determined by genetics at the outset, and altered
over time through the course of experience and learning (Melzack, 2001). The
neural loops extend through sensory regions of the body and brain, cognitive brain
regions (processing meaning, attention and memories), and emotion processing
regions (Melzack & Katz, 2013).
The neuromatrix theory, incorporating sensory, cognitive, and emotion processing systems, provides an explanation for the apparent exacerbation of pain through stress, and lowered tolerance to pain with negative moods. Unlike earlier pain theories which proposed a bottom-up model of pain perception originating with sensory stimuli, the neuromatrix theory affords an understanding of phenomena such as phantom limb pain and complex regional pain syndrome, suggesting that pain may also have the potential to originate in the brain (Melzack & Katz, 2013).

A major development in the current understanding of chronic pain is the concept of neuroplasticity. Structural changes such as neuroplastic re-wiring sometimes follow certain somatic traumas, supplying a proliferation of neural connections to aberrant areas of activity, while other areas see a degradation of neural connections (Kuner, 2010). Injury or illness can also result in functional changes in the nervous system. Spontaneous or excess neural activity at different levels of the nervous system can occur following trauma when neurons become abnormally excitable or sensitized due to over-activity and release of chemicals at the synapses, leading to further stimulation of some neurons (Baliki & Apkarian, 2015; Kuner, 2010). These structural and functional changes to the neural circuitry are the major mechanisms of sensitization, a phenomenon believed to underlie many chronic pain conditions.

Sensitization may also be due in part, to interruptions in the inhibitory mechanisms that normally occur in a healthy system (Melzack & Katz, 2013). In chronic pain conditions these changes may generate higher neuronal reactivity to normally innocuous stimuli, resulting in spontaneous neural firing and the
transmission of signals which are perceived as painful (Kuner, 2010). Chronic pain conditions such as fibromyalgia, osteoarthritis, and chronic low back pain are thought to arise from sensitization of the neural circuitry in the central nervous system (Staud, 2011). Importantly, sensitization cannot be detected by current medical technologies. Pain conditions exacerbated by sensitization processes may therefore be difficult to verify, leaving patients without medical evidence to support their claims of pain.

**The biopsychosocial model.** In keeping with the neuromatrix theory that the experience of pain is necessarily influenced by affective and cognitive factors, the biopsychosocial model postulates that pain perception is influenced by a multidimensional array of influences including biological, psychological, and social factors (Meints & Edwards, 2018; Turk & Okifuji, 2002). Biological factors may include genetic predispositions, while psychological factors involve self-beliefs and affect, and social factors include the cultural context of attitudes and beliefs about pain that the individual experiences (Asmundson & Wright, 2004). Each factor can impact on the other dimensions. To illustrate, an individual with a *biological* propensity for low stress tolerance may be pain-affected more strongly by *social* discrediting of their pain, while another individual who has much *social* support in their pain experience might have less *psychological* distress (and as a result, experience less pain). The biopsychosocial model provides a rich description of how biological, social and psychological factors influence affect and cognition, whereas the neuromatrix theory describes how affect and cognition in turn, impact on the neural systems that process pain.
The Importance of Pain-Validation

Relentless pain is a heavy burden in itself and may be compounded by the additional distress of having one’s experience disbelieved or invalidated by important social others (Birk, 2013; Sim & Madden, 2008). In the absence of an obvious injury or illness, the origin of chronic pain can be difficult to determine, making diagnosis of the pain condition difficult in many cases (Fink & Rosendal, 2008). Even in cases for which a diagnosis can be provided, the medical label itself may be unfamiliar to general society and hold little meaning. When the reason for an individual’s continuing pain is unclear it may be difficult to accept the truth in the sufferer’s symptom complaint. As a result, people with chronic pain commonly experience a degree of pain-invalidation from members of their community (Asbring & Narvanen, 2002; Barker, 2011; Birk, 2013; Soderberg, Lundman, & Norberg, 1999).

When the source of pain has an understandable explanation or label, as in the case of injury, inflammation, or a known illness, then the individual’s pain is more acceptable and relatable to others, who may readily offer support. A medical doctor’s endorsement is regarded as central to verifying the presence of illness in Western society (Kleinman, 1978; Glenton, 2003). However, when no medical explanation or evidence can be provided for pain symptoms, particularly over the long term, many individuals find that members of their social community become disbelieving and unsupportive of their experience (Asbring & Narvanen, 2002; Barker, 2011; Birk, 2013; Soderberg et al., 1999).

The inability to prove a legitimate pain condition can result in frustration, anger, and depression (Newton, Southall, Raphael, Ashford, & LeMarchand,
A lack of evidence can also lead to stigmatization (Holloway, Sofaer-Bennett, & Walker, 2007; Slade, Molloy, & Keating, 2009; Toye & Barker, 2010), another important psychosocial stressor, having been linked to higher pain intensity and poorer levels of physical functioning (Scott, Yu, Patel, & McCracken, 2019). Not only does the doctor’s endorsement of the patient’s illness provide evidence for belief by the patient’s immediate community, but effective management of the pain condition may also hinge upon the quality of the patient-doctor relationship. Research by Oosterhof, Dekker, Sloots, Bartels, and Dekker (2014) revealed that chronic pain patients’ sense of ‘being taken seriously’ (p. 1909) can affect the quality of relationship between patients and healthcare professionals, and impact significantly on self-reported rehabilitation outcomes. This was reinforced in a study of \( N = 688 \) patients with chronic low back pain, finding that patient satisfaction within the doctor-patient relationship was central to treatment outcomes such as levels of pain, disability, and psychological status (Farin, Gramm, & Schmidt, 2013).

Pain-invalidation can also happen at the ‘Self’ level. Self-invalidation of pain is similar to “self-stigma”, described as a process whereby the individual, firstly, develops an awareness of commonly known negative stereotypes about their given condition, together with an endorsement of these beliefs; secondly the individual applies this internalised belief toward themselves (Corrigan, Watson, & Barr, 2006). However, self-directed pain-invalidation differs from self-stigma in that invalidating behaviours and attitudes can be derived from self-beliefs from one’s own schemas, not necessarily common stereotypes derived from the community.
Pain Over-Validation

At the other end of the validation spectrum lies the issue of excessive validation, which has a number of risks to those afflicted with chronic pain. Beyond their belief and acceptance of the individual’s pain symptoms, well-meaning members of the social community may attempt to make life easier for the individual in pain by taking on much of their daily task burden. Over-attendance to an individual’s ongoing pain behaviours may be detrimental by way of diminishing their capacity to function normally, eliciting further illness behaviours (Romano, Jensen, Schmaling, Hops, & Buchwald, 2009).

**Pain and illness behaviours.** Over-validation by well-meaning others is often associated with illness behaviours. “Abnormal illness behaviour” was first described by Pilowsky (1969, p. 347) indicating “sick role” (Parsons, 1951, p. 436) behaviours that are unwarranted or do not match the severity of the individual’s condition. Admission to the sick role, and its benefits, are largely coupled with an investment in illness or pain behaviours that are appropriate for the role. Accordingly, even with the understanding that the sick role is a temporary one from which the individual desires to recover, those afflicted are sometimes known to struggle with the transition back to a healthy identity (Berk et al., 2012). Illness behaviours such as guarding the injury, or remaining inactive, may initially occur with the pain patient’s belief that they are unable to perform a task, or to protect the self from pain or worsened condition. Fordyce et al. (1973) was instrumental in the adaption of operant conditioning principles to a ‘behavioural model’ of pain. Fordyce et al. posits that patterns of behaviour by the individual in pain could bring about positive responses such as avoidance of
duties, avoidance of pain, or obtaining assistance from nearby others, thereby reinforcing such behavioural patterns.

The maintenance of pain behaviours can also be considered in light of the fear-avoidance model (FAM) of pain behaviour initially proposed by Lethem, Slade, Troup, and Bentley (1983), which posits that the detection of pain upon movement may cause avoidance of activity. Vlaeyen, Kole-Snijders, Boeren, and van Eek (1995) furthered the model to specify cognitions such as a belief that avoidance of movement is due to fear of re-injury or worsening an injury. Subsequent research has found much support for the positive association between fear of movement and pain-related disability (Luque-Suarez, Martinez-Calderon, & Falla, 2019; Zale, Lange, Fields, & Ditre, 2013)

Caregiving behaviours given by immediate others such as providing help, sympathy, and taking over patient responsibilities in response to expressions of pain are often labelled as *solicitous* behaviours (Romano, Jensen, Turner, Good, & Hops, 2000; Weiss & Kerns, 1995). While the core of solicitiousness is based on (generally behavioural) responses, over-validation can be viewed as capturing both behaviours and perceived attitudes directed toward the pain patient. The two concepts, however, are overlapping to an extent. Research shows that solicitous behaviours are associated with increased pain behaviours (Mohammadi, Dehghani, Sanderman, & Hagedoorn, 2017; Pence, Thorn, Jensen, & Romano, 2008), increased pain intensity (Flor, Kerns & Turk, 1987; Pence et al., 2008) and decreased activity levels of those with pain (Flor et al., 1987; McCracken, 2005), and heightened disability (Romano et al., 1995).
There is a delicate balance to be found between largely discounting or over-indulgent responses to pain behaviours. Ignoring displays of pain may elicit more exaggerated pain behaviours, particularly in high pain catastrophizers, who may be better dealt with using an empathic and validating approach (Sullivan, 2012). However, a family member who attends excessively to their loved one with chronic pain in order to reduce any communicated distress may contribute to a heightened state of disability for the pain-afflicted individual (Romano et al., 2000; Sullivan, 2012). Thus, it appears that in a therapeutic setting, early identification of inappropriate levels of pain-validation may be of particular value for clients seeking pain management interventions.

**Measuring Pain-Validation**

In order to identify pain-invalidation or over-validation, therapists may benefit from the use of a valid, reliable measure of the pain-validation construct. To date, measures of the pain-validation construct are scarce at best. One scale that attempts to measure a sense of invalidation in people with chronic illness is the Illness Invalidation Inventory (3*I; Kool et al., 2010). The 3*I contains eight items that load onto two factors, including: ‘discounting’, and ‘lack of understanding’ (Kool et al., 2010, p. 1992). The inventory requires the respondent to answer the eight items in relation to five separate domains: spouse, family, work environment, medical professionals, and social services. The 3*I was validated using populations of individuals with rheumatic conditions, including patients with fibromyalgia (Kool et al., 2014) and, more recently, those with lower back pain (Molzof et al., 2020).
Data collection for the initial development of the 3*I, however, did not include populations with other chronic pain conditions such as migraine, complex regional pain syndrome, neuropathy, or abdominal conditions. Furthermore, the scale contains only eight items designed to be applied identically across five social categories, which necessarily means that item wording was designed with limited capacity to capture a variety of experiences that might pertain only to particular social categories. For example, items seeking to measure the presence of emotional experiences or self-judgements, could not be mapped across to apply to other social domains of validation, and thus do not appear to be measured by the 3*I.

**Thesis Overview**

Given the impact of pain-validation issues, and the frequency with which it appears in the qualitative literature, the importance of investigating pain-validation, invalidation and over-validation for those with chronic conditions was apparent. This project was, therefore, devoted to the construction of a Pain-Validation Scale\footnote{This research is largely focused on the development of the Pain-Validation Scale.} capable of measuring pain-validation across multiple domains. Approval for this research was obtained from the Murdoch University Human Research Ethics Committee, project number 2017/017 (Appendix A).

Chapter 2 features an article manuscript, prepared for submission to a peer-reviewed journal. The article offers a definition for the construct of pain-
validation and highlights the importance of validating pain in protecting the psychological wellbeing of sufferers, and in terms of psychotherapeutic intervention. Related research was undertaken in the more formally systematized process of Study 1 – the thematic analysis, presented in Chapter 3. Thematic analysis of the narrative literature provided a more holistic conceptualization of chronic pain, a deeper understanding of issues for pain sufferers, and enabled the creation of items designed to measure the pain-validation construct.

The primary objectives of the thematic analysis were to:

(i) Determine the most predominant themes arising from an examination of pain narratives.

(ii) Use themes resulting from the analysis as a foundation for the creation of an item pool for the Pain-Validation Scale.

The creation of a robust and reliable psychometric instrument involves many stages. Chapter 4 documents the stages of Study 2 – Development of the Pain-Validation Scale, incorporating the following main objectives:

(i) Creation of a comprehensive and unambiguous item pool, response scale, and participant instructions.

(ii) Piloting of the measure to a sample of people with chronic pain.

(iii) Exploratory factor analysis of the resulting data to facilitate item reduction.

After reduction of the item pool to a distilled collection deemed to best represent the pain-validation construct, Study 3 was conducted to test and validate the proposed model (Chapters 5 and 6). Chapter 5 documents the re-issue of the
Pain-Validation survey to a new sample of individuals with chronic pain, and confirmatory factor analyses of the resulting data using structural equation modelling to confirm the model of best fit.

Validity\(^2\) and reliability analyses were performed on the final instrument, with the outcomes presented in Chapter 6.

Thus, objectives for Study 3 were as follows:

(i) Use structural equation modelling to determine the strength of relationships between the latent variable (construct) and measurement variables (scale items), in order to determine the suitability of the scale for measurement of pain-validation.

(ii) Refine the model, parsing down the item list to establish the model of best fit.

(iii) Demonstrate evidence for validity relating to content and internal structure of the Pain-Validation Scale, and with regard to its relationships to other measures.

\(^2\) For the purposes of fluency the term validity will be used, in some instances, as a descriptive quality of a given psychometric measure. Some argue, however, that validity is not an attribute of the test itself, rather, that it pertains to the conclusions or inferences that the test allows the user to make when interpreting test results (Cizek, 2012; Lenz & Wester, 2017; Trochim, Donnelly, & Arora, 2016).
A summative discussion of the findings arising from the research is offered in Chapter 7. The studies are reviewed in terms of strengths, weaknesses, and their implications in the context of therapeutic interventions for pain management. Further, in the course of uncovering important information and answers about the complex of factors in chronic pain, this research also raised questions to be explored in future studies, as suggested in the closing chapter. Figure 1 illustrates the sequence of major study events in this research.
Chapter 1: Introduction and Overview

Figure 1. Flow chart showing the sequence of research events in developing the Pain-Validation Scale.

- Systematic literature search
- Analyze pain narratives
- Define pain-validation
- Identify pain-validation themes
- Create (128) item pool
- Expert review (82 items left)
- Community feedback (79 items)
- Survey distribution and EFA
- Survey distribution and CFA
- Structural equation modelling
- Model Validation including content validity, SEM (goodness of fit), internal consistency, test-retest reliability, and predictive validity
Current measures of the pain-validation construct are scarce and under-developed. The ability to measure pain-validation levels may help pain management professionals identify key psychological issues that can be addressed early in the therapeutic process.

As such, the overarching aims of this research were to:

(i) conceptualize and define the construct of pain-validation, and
(ii) develop a sound instrument with the breadth yet efficiency to test pain-validation levels in individuals with chronic pain.

Finally, two claims are defended within this thesis. Firstly, it is argued that pain-validation is most effectively assessed through the measurement of 4 subcomponents of the pain-validation construct: ‘Invalidation by the Self’, ‘Invalidation by Immediate Others’, ‘Invalidation by Healthcare Professionals’, and ‘Over-validation’. Secondly, it is argued that the Pain-Validation Scale is a sound instrument, suitable for use by pain management professionals in determining problematic pain-validation levels in chronic pain patients.
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Chapter 1: Introduction and Overview


CHAPTER 2
Defining Pain-Validation

Pain literature reveals the psychological detriment to those experiencing pain-invalidation, and the potential recovery limitations imposed on patients through excessive interference by well-meaning others (over-validating pain). As such, the need for a psychometric instrument capable of measuring the degree of validation experienced by individuals with chronic pain, is indicated. In order to develop a psychometric instrument that produces valid results the item set must measure the construct in question, being adequately inclusive of all elements within its domain, while avoiding the inclusion of variables outside of the construct definition (DeVellis, 2017). Thus, a crucial step prior to the development of an effective instrument is to clearly define the construct to be tested (Clark & Watson, 1995; Hinkin, 1998).

Though there is much literature thematically indicating the negative effects of minimizing, ignoring, or denigrating an individual’s complaints of ongoing pain, such themes are not often explicitly identified as pain-(in)validation. The following manuscript, prepared for submission to a peer-reviewed journal, offers a construct definition for pain-validation generated through thematic analysis\(^1\) of

\(^1\) The thematic analysis described in Study 1 (Chapter 3) was integral to the understanding of pain-validation and formulation of its definition, and is, therefore, referred to in the current chapter. However, the manuscript in the current chapter is presented prior to the thematic analysis as it provides context for this research (reviewing the literature identifying the importance of validating pain), and offers a foundational definition of pain-validation, a construct which is as yet undefined.
chronic pain narratives, and drawing together concepts of validation as discussed by authors in the context of therapy (Gilbert, 2010; Leahy, 2005; Lee & James, 2011; Linehan, 1997). The article to follow also explains the importance of pain-validation in light of Hobfoll’s (1989) conservation of resources theory of stress, and in terms of the broader consequences of having a chronic pain condition. Additional discussion is provided around the need for pain-validation in the early stages of pain management therapy.
Chapter 2: Defining Pain-Validation

Chapter References


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Defining Pain-Validation: The Importance of Validation in Reducing the Stresses of Chronic Pain

Purpose: To validate an individual’s feelings or behaviour is to sanction their thoughts or actions as worthy of social acceptance and support. In contrast, rejection of the individual’s communicated experience indicates a denial of social acceptance, representing a potential survival threat. Pain-invalidation, though ill-defined, appears to be a fundamental component of psychosocial stress for people with chronic pain. As such, this paper aims to define pain-validation and outline its importance for those with chronic pain. Methods: The pain-validation construct was defined using themes inherent in the narratives of those with chronic pain, as identified in a previous systematic search and thematic analysis, together with examination of additional literature on validation in the clinical context. Results: We present a construct definition, proposing that pain-validation must necessarily include: (i) belief that the pain experience is true for the individual, (ii) acceptability of the individual’s expressions of pain, and (iii) communication of belief and acceptability to the individual experiencing pain. Further, we outline the importance of pain-validation as a protective factor and means of reducing many of the psychosocial stresses of chronic pain; for example, by indicating social support for pain-coping, buffering negative emotions, and re-enforcing unity and shared identity. Implications: The role of pain-validation in the current era of pain management intervention is discussed. Given that the basis of intervention often involves cognitive and behavioural change, the difficulties of change adherence are highlighted, with acknowledgement and discussion of the patient’s initial pain status, therefore, an essential first step.

Keywords: chronic pain; pain-validation; invalidation; stress; pain-management
Impact and Implications

- Pain literature includes much discussion on the experiences of stigmatization, critical judgement, and lack of belief regarding symptoms described by chronic pain patients. The aim of this paper is to articulate these experiences as an integrated concept of pain-(in)validation. Further, we offer a construct definition of pain-validation, to enhance clarity in future academic discussion, and to provide a basis for operationalization of the construct.

- Social stress arising from pain-invalidation may be an important issue to address in the early stages of pain management therapy. There may be particular therapeutic benefit in normalising pain patients’ experiences, providing reassurance that their complaint is reasonable, understandable, and commonly shared.

- Pain-management interventions most often involve cognitive or behaviour change. Given that therapeutic change is often effortful and uncomfortable for the patient, a strong and trust-filled therapeutic alliance between patient and therapist is key for patient adherence to intervention strategies. In this paper we outline the role of pain-validation in building trust and demonstrating genuine understanding in the therapeutic relationship, thereby supporting the patient through the process of change and successful pain management.

Introduction

The need to feel validated can be understood from an evolutionary perspective. As social animals, humans prefer to live in groups as this provides survival advantages
(MacDonald & Leary, 2005) through protection from threats, sharing of resources and skills, and division of labour (Baumeister & Leary, 1995). Group members who do not fit in with acceptable norms risk being cast out of the group, and are thus no longer afforded its protection or access to shared resources necessary for survival. Indeed, the basic need for group belonging and acceptance, and its centrality to behavioural motivation, has been a long-standing topic in the literature of human psychology (Baumeister & Leary, 1995; Baumeister & Tice, 1990; Maslow, 1968). To maintain a sense of belonging, the individual must perceive their beliefs, lived experience and actions to be understood and accepted by group members; that is, the individual seeks validation by the social network.

The narratives of those with chronic pain, in particular, suggest the need for their experience to be acknowledged, believed and supported by others (Birk, 2013; Glenton, 2003; Holloway, Sofaer-Bennett, & Walker, 2007; Werner & Malterud, 2003). While the desire to feel validated is a clear theme expressed by individuals with pain, validation as a construct has yet to be defined adequately in the context of chronic pain. In this paper, we aim to build upon the current conceptualization of validation as applied in therapy, and as it appears thematically in pain narratives and other literature, to establish a substantive definition of pain-validation. In addition, we examine how levels of pain-(in)validation may impact upon the psychosocial stress of individuals with chronic pain, when viewing these constructs from the perspective of Hobfoll’s (1989) conservation of resources theory of stress. Finally, we propose the benefits of incorporating specific pain-validation practices within pain management interventions, in terms of improving treatment motivation and adherence.
**Foundational Themes of Validation**

Validation has been explored by specialists of ‘compassion in therapy’ (Gilbert, 2010; Leahy, 2005; Lee & James, 2011), with Leahy (2005) describing validation as an acknowledgement of the individual’s experience, and one that is recognized as reasonable and worthy of due attention. In her work with clients diagnosed with borderline personality disorder, Marsha Linehan espoused the importance of validation in early therapy sessions (Linehan, 1993). Linehan (1997, 2015) submits that validation of the client requires the therapist to communicate acceptance and demonstrate that the client’s expressions are worthy of attention, taking care not to discount or disparage. Linehan (1997) likens her definition of validation to Rogers’ (1957, 2007) ‘unconditional positive regard’ in the therapy relationship. Rogers (1957, 2007) depicts unconditional positive regard as caring and non-judgemental acceptance of the client and their experience, and asserts that therapists must portray such an attitude in order for therapeutic change to occur.

Researchers have also explored the types of communication styles used by medical practitioners, particularly relating to the validation and invalidation of the client during a consultation. In particular, patients with medically unexplained symptoms or ‘contested illnesses’ such as chronic fatigue syndrome, multiple chemical sensitivity (Dumit, 2006) or fibromyalgia (Durif-Bruckert, Roux, & Rousset, 2015), have expressed difficulty having symptoms accepted as being legitimate by medical practitioners. As an alternative to doctors' closed and dismissive communication styles often experienced by patients with chronic pain (Toye & Barker, 2012; Werner & Malterud, 2003), Epstein et al. (2006) describes a ‘partnering’ communication style that seeks to understand the patient’s
experience, acknowledges uncertainty or ambiguity around symptoms, and welcomes patient input into the treatment plan.

Feeling validated, however, necessarily comes from the patient perspective. Thus, in order to define pain-validation, a clear understanding must come from the voices of those with chronic pain. A thematic analysis of pain narrative literature was recently performed to determine themes representative of pain-validation and invalidation (Nicola, Correia, Ditchburn, & Drummond, 2019). A systematic search strategy (see Appendix – Nicola et al.) was applied to 5 databases in March 2019, resulting in a final collection of 431 articles suitable for analysis. Examination of the data corpus gave rise to 5 major themes (Nicola et al., 2019), with narratives commonly expressing invalidation of pain as attitudes ranging from a lack of belief (Holloway, et al., 2007; Werner & Malterud, 2003) to a lack of compassion (Birk, 2013; Honkasalo, 2001), a lack of understanding by others (Glenton, 2003), and feeling stigmatized (Brooks, Unruh, & Lynch, 2015; Slade, Molloy, & Keating, 2009). Failure to validate one’s own pain was also identified in terms of moral failure, guilt, shame, and burdening others, and was represented as the fifth theme of critical self-judgement.

These descriptions illustrate the primary need for individuals to have their experience confirmed as both understandable and deserving of empathy. Such conditions are foundational to normalizing thoughts, feelings, and actions of clients in therapy. By characterising their feelings and behaviours as understandable, given the context and history of circumstances (Leahy, 2005), and through the practice of self-compassion, barriers to healing such as client shame and self-criticism (Gilbert & Procter, 2006) can be broken down. At its core, normalizing
an individual’s experience is about conveying that it and they are still acceptable, thereby providing assurance that the individual has not violated any terms of membership to the societal group.

**Defining Pain-Validation**

This paper builds on the comprehensive review of pain narratives (Nicola et al., 2019) identifying component themes of pain-validation, to offer a construct definition. These themes, together with additional discourse conveyed by therapists and leading researchers in the field (Gilbert, 2010; Leahy, 2005; Linehan, 1997; Rogers, 2007), suggest that the definition of pain-validation is founded in one’s communication of pain being acknowledged, deemed believable, and construed as acceptable. Thus, pain-validation incorporates three essential elements:

1. **Belief.** Pain-validation requires acknowledgment and belief that the experience is real and true for the individual. Pain is a construct that varies in severity, among other dimensions (e.g. sensation type, and episode length). Furthermore, pain is subjective, and the meaning of its perception will be influenced by one’s own conceptualization and definition of pain. With regard to pain-validation, however, the level of pain in absolute terms is of little importance; rather, it is the reported experience of the individual’s suffering that matters. This can be eased by acknowledging its existence. In contrast, rejection of a person’s claim or expression of experience acts to stonewall further communications, collaborative solutions and social support.
2. **Acceptability**. Pain-validation requires that the individual’s pain is deemed acceptable. It is agreed that the pain may arise from a combination of factors within the human body, and though the reasons for an individual’s ongoing symptoms may sometimes be unclear, acceptability implies that the individual’s suffering can be understood and empathized. Pain is endured by a substantial proportion of society and, to that extent, falls within the range of normal human experiences. Affirming another person’s experience of pain as acceptable effectively normalizes that experience and, by extension, the individual, thus allowing them to maintain a secure position of group belonging.

3. **Communication to the individual.** Pain-validation by others necessitates a third feature in that the first two elements, belief and acceptability of the pain, are communicated to the individual, effectively removing doubts or perceptions of negative judgement.

In outlining this construct definition, it may be useful to distinguish here how pain-validation differs from the related construct of compassion. With its central components of belief and acceptability, pain-validation is an attitude communicated by the observer, with the specific intention of legitimising the sufferer’s experience. Compassion, however, can be understood as a higher-order construct that refers to

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The term ‘acceptability’ is used here to reflect one’s values and attitudes toward the expressions of the individual with pain; that is, the degree to which those expressions are acceptable. Acceptability is used as a concept distinct from that of ‘pain acceptance’ – a construct consisting of readiness to experience pain, and engagement in activities despite pain (McCracken, Carson, Eccleston, & Keefe, 2004).
a perspective of shared humanity, whereby an individual becomes aware of, and emotionally moved by suffering (of the self or others), and feels inclined to alleviate it (Strauss et al., 2016). While both constructs involve the witness and recognition of another’s suffering, compassion includes an emphasis on intention of action toward easing suffering (Strauss et al., 2016), whilst the mainstay of pain-validation is in sanctioning the experience of pain, as communicated by the individual.

Why do people invalidate pain?

Narrative literature is replete with stories of individuals who share a range of pain-invalidation experiences from within the community. A lack of belief regarding the sufferer’s pain often begins with difficulties establishing medical evidence for symptoms. Indeed, there are numerous accounts of people who perceive a degree of pain-invalidation when visiting their healthcare professional (Birk, 2013; Holloway et al., 2007; Slade et al., 2009). The biomedical model of pain regards pain as a direct result of tissue damage, and promotes that evidence must be present in connection with pain symptoms (Okifuji & Turk, 2015). However, diagnosis of a pain condition may be difficult for medical professionals where scans and testing fail to provide confirmation of injury or illness in the body. Thus, medical professionals and insurance providers subscribing to the biomedical model, who cannot find evidence for a patient’s pain, may regard their symptoms with skepticism (Okifuji & Turk, 2015). Doctors may attribute pain symptoms to stress and refer the patient to seek psychological counselling to address underlying issues. While psychological intervention is recognized as an effective, evidence based approach in treating certain pain conditions (Okifuji & Turk, 2015), the inference by doctors that psychological issues are the underlying cause of their complaints
can be invalidating for some patients, who may perceive that healthcare professionals have identified them as ‘hypochondriacs’, ‘faking,’ or ‘crazy’ (Glenton, 2003; Holloway et al., 2007).

The absence of medical evidence or lack of a doctor’s diagnosis can, in turn, affect judgements made by the patient’s wider social network, since Western society holds medical endorsement as key to verifying illness status (Glenton, 2003). Moreover, employers, co-workers, friends and family may hold no better understanding than doctors about the characteristics and nuances of pain conditions and their symptoms. Fluctuating pain levels across the day or week can produce inconsistent patterns of activity or task capability, with symptoms virtually incapacitating the individual on one day, and abating the next (Nilsen & Anderssen, 2013). The variability in functional capacity may leave healthy individuals questioning the validity of the sufferer’s claims (Nilsen & Anderssen, 2013).

The web of factors connecting pain and its by product, fatigue, are also unappreciated by many without ongoing pain. On one level, the experience of chronic pain can be physically exhausting and leaves the individual bereft of energy for engagement in valued and necessary activities. Pain can also interfere with the quality of evening sleep, causing additional fatigue throughout the day (Sturgeon, Darnall, Kao, & Mackey, 2015). Those without first-hand experience may be unaware of the draining nature of chronic pain and fail to make the connection between pain-related fatigue and the patient’s current limitations around activities such as driving, socializing, or working at their former pace or load. Without a full understanding of pain and its constituent factors, others may invalidate pain, instead attributing the patient’s performance failures to personal motives and character
flaws such as hypochondria, attention-seeking, laziness, malingering, and commitment avoidance (Ojifuki & Turk, 2015). A lack of visible evidence for an individual’s pain symptoms, and a lack of understanding about the nature of pain, can undermine the credibility of the sufferer’s claims and, thus, the acceptability of their pain.

Invalidation through unacceptability of pain can also occur at the level of the self and may be evidenced by discounting of one’s own pain experience, or resisting a self-compassionate attitude, instead adopting a ‘toughen up’ approach (Carroll, Rothe, & Ozegovic, 2013). Some feel guilty about even acknowledging their own discomfort, knowing of others with a potentially life-threatening condition (Broom, Kirby, Adams, & Refshauge, 2015). Guilt can extend through the individual’s self-concept, seeing their illness as a burden to others who are left to take on additional duties or stress (Vroman, Warner, & Chamberlain, 2009). Pain-invalidation by the self is also demonstrated as anger by those who regard pain as a failure of their own body (Vroman et al., 2009). Invalidation by the self or by others may also relate to pre-formed attitudes toward pain, such as those who have been conditioned to view pain displays as self-indulgent or a sign of weakness. People can fear demonstrating compassion toward the self or others, having suffered abuse or rejection when showing vulnerability on previous occasions (Gilbert & Procter, 2006) and may, therefore, demonstrate less empathy and tolerance toward those expressing pain.

**Pain-Validation for Stress Reduction**

The experience of chronic pain is associated with ongoing biological, psychological and social stresses. When faced with challenge or stress, be it physical or
psychological, the body responds by activating the hypothalamic pituitary adrenal (HPA) axis in an effort to make energy available, divert blood flow to muscles, and prepare physiological systems for fight or flight (Melzack & Katz, 2013). Those with chronic pain may undergo prolonged periods of stress. As a result, the persistent activation of the HPA axis in response to stress may produce sustained, elevated levels of cortisol in the body, causing detrimental effects such as the breakdown of cellular structures, fatigue, and compromised immune function (Melzack & Katz, 2013). Additionally, stress triggers inflammatory processes and other mechanisms in the body that underpin chronic pain (Davis et al., 2008). Pain-validation is of great importance, therefore, since it is central in attending to, and alleviating a number of stresses faced by those with chronic pain.

**Pain as resource stress**

Given a human’s inherent awareness that survival may hinge on maintaining their membership in the societal group, it is understandable that rejection by group members would cause stress. Lazarus and Folkman (1984) purported that stress arises as a result of a perceived insufficiency of resources to cope with the challenges posed by one’s environment, as appraised by the individual. Hobfoll (1989) expanded on earlier stress theories, proposing the conservation of resources (COR) model which holds that stress arises from the threat to, or actual loss of resources, or from a lack of resource acquisition. Hobfoll’s COR theory asserts that people work to build and maintain resources for coping with challenges. By Hobfoll’s definition, resources consist of personal characteristics, objects, energies, and conditions that serve to increase the level of assets valued by the individual such as success, social status, and the accumulation of further resources. Thus,
resources relevant to pain-coping include internal character traits such as self-esteem, optimism and goal pursuit; or other external conditions such as social support (Hobfoll, 1989; Hobfoll, 2002; Mun et al., 2019).

Further described within the COR model, Hobfoll (2002) posits that resource gain becomes more important emotionally when the individual is faced with loss of resources. People with chronic pain may find it more difficult than most to acquire or retain personal resources. For example, individuals with pain conditions may experience a decline in functional mobility, employment capacity, optimism, and / or self-esteem (Werner, Isaksen, & Malterud, 2004). In the case of reduced employment, they may become financially depleted (Walker, Sofaer, & Holloway, 2006), a problem further compounded by the cost of medical treatment. Social status may decline with job loss as the individual forfeits the ranking associated with a particular job role; and personal status in the family home may be threatened if capacity as the main ‘breadwinner’ or as the ideal ‘homemaker’ is lost (Snelgrove, Edwards, & Liossi, 2013; Soklaridis, Cartmill, & Cassidy, 2011). In addition, chronic pain is often accompanied by fatigue (Sturgeon et al., 2015), hindering the individual’s capacity to maintain social relationships that may otherwise serve as a support resource (Soklaridis et al., 2011). For those with chronic pain, limited means of building a resource base, together with the cumulative taxing of current resources, creates major coping stresses under the paradigm of Hobfoll’s (1989) COR theory of stress.

The loss of resources through having pain comes, paradoxically, at a time when assets and reserves are needed more than ever. As other resources become depleted, people with chronic pain may rely on the social support of friends, family
and community members. However, having one’s pain invalidated indicates a denial of support (Kool, van Middendorp, Lumley, Bijlsma, & Geenen, 2013), either moral or physical. As pain-validation incorporates belief and acceptability of reported experience, the invalidation of pain suggests that the individual’s expressions of pain are, in fact, unacceptable. At best, the pain-invalidated person is left to manage alone in their suffering; at worst, the individual risks being ostracised by their social network if they maintain their claims of pain publicly.

**The stress of social exclusion**

Anxiety is an ongoing psychological stress common to many living with long-term pain. Numerous aspects of chronic pain may cause anxiety, with a large range attributable to psychosocial issues, particularly those related to pain-invalidation. To the extent that pain communications are invalidated by societal others, continued expressions of pain constitute non-conformity to the values or standards of the societal group. Within the framework of exclusion theory, Baumeister and Tice (1990) suggest that social exclusion may occur in the event that an individual fails to contribute sufficiently toward benefiting the group. Thus, in accordance with exclusion theory, loss of functional ability and employability are undesirable qualities since they may be viewed as evidence of limited contribution capacity, and may therefore be a major source of anxiety for individuals with pain. Non-conformists to the group risk alienation and social exclusion which represents a fundamental threat to the self (Baumeister & Tice, 1990). Given the functional limitations inherent in many chronic conditions, patients with chronic pain may experience a heightened degree of anxiety over the prospect of denied social
acceptance, since social support represents an important resource for coping (Evers, Kraaimaat, Geenen, Jacobs, & Bijlsma, 2003; Mun et al., 2019).

Exclusion from group membership may also occur, as posited by Baumeister and Tice (1990), when individuals contravene the rules and standards of behaviour expected by the group, since rule-breaking threatens disruption to the harmony and living dynamic of the group. As such, all members must behave in accordance with the group’s moral norms. For those whose pain remains unsanctioned, the receipt of financial benefits, specialized services, or exemption from standard commitments, may be viewed by many as acting outside of the conventions and rules expected of society members. As such, pain-invalidated individuals may bear the stress of being condemned by others in society who do not recognize theirs as a case for special allowances.

The physiological effects of social validation stress have been demonstrated by Shenk and Fruzzetti (2011) in an experiment showing that individuals who received invalidating responses to their emotions arising from a stressful task demonstrated higher emotional reactivity, negative affect, heart rate, and skin conductance levels than individuals who were validated when expressing their feelings about the same task. Results supported the enhancing effect of validation on the individual’s ability to regulate emotional reactivity in stressful conditions. Current research showing that social stress and negative emotions exacerbate pain perception (Ghavidel-Parsa et al., 2015) lends support to Shenk and Fruzzetti’s (2011) suggestion that individuals in validating environments may enjoy better health in the long term, since emotional support may be protective to those experiencing prolonged exposure to stress accompanying chronic pain (Benka et
al., 2012). These findings are also supported from a physiological standpoint by studies showing that increases in cortisol levels and proinflammatory immune processes occur in response to perceived threats to the social self (Dickerson, Gruenewald, & Kemeny, 2004).

A number of other experimental studies lend support to the concept of social influence on the perception of physical pain. Brown, Sheffield, Leary, and Robinson (2003) found that participants exposed to social support during a cold pressor task reported lower levels of pain than participants who were denied social support during the same task. Furthermore, support for social influence on pain perception was demonstrated in fMRI studies (Eisenberger, 2012) in that the experience of social exclusion used similar neural processing pathways to those typically recruited in processing physical pain.

Meanwhile, support for the role of social connectedness in moderating stress has been well documented (Aanes, Mittelmark, & Hetland, 2010; Henne, Morrissey, & Conlon, 2015). Social support is associated with lowered pain ratings and higher levels of pain-coping (Holtzman, Newth, & Delongis, 2004), and better functional capacity (Evers et al., 2003) in those with chronic pain. A possible explanation for these effects is offered in the findings (Eisenberger, Taylor, Gable, Hilmert, & Lieberman, 2007) that social support reduced neuroendocrine responses to social stressors, suggesting a lowered sensitivity to potentially stressful experiences (such as critical judgement). Studies also show that the presence of oxytocin, a hormone associated with social bonding (Carter, 1998), attenuates levels of cortisol in response to social stress (Heinrichs et al., 2001). Further studies showed that a combination of social support and oxytocin was associated with the
greatest reduction in cortisol levels following social stress, when compared to participants in control conditions (no support or oxytocin), a group with only social support, and those administered oxytocin alone (Heinrichs, Baumgartner, Kirschbaum, & Ehlert, 2003). Figure 1 illustrates how a lack of pain-validation and social support may relate to psychological distress and the potential exacerbation of chronic pain.

*Figure 1.* Proposed relationship between pain-invalidation, psychological stress, and the exacerbation of chronic pain.

*Note.* Social disbelief of pain, and judging the pain experience as ‘unacceptable’, are components representing a lack of pain-validation. Additionally, a lack of validation can also promote further social discrediting and unacceptability.

**The stress of identity loss**

Beyond the stress imposed on sufferers who are socially unsupported, the importance of validation becomes apparent through a broader understanding of
chronic pain and its consequent effects. Examination of narrative literature reveals that ‘having chronic pain’ can be understood as more than the ongoing experience of physical discomfort. For many, having pain results in a myriad of direct consequences such as functional limitation which impedes the capacity to work, to continue as the financial provider, perform home or family duties, and socialize with friends (Haraldseid, Dysvik, & Furnes, 2012; Soklaridis et al., 2011). In these ways, living with chronic pain may result in a loss of identity, declining independence, reduced self-esteem, breakdown of relationships, and the resulting array of negative emotions (Haraldseid et al., 2012; Soklaridis et al., 2011; Wuytack & Miller, 2011). The outcomes of having chronic pain, as seen in Figure 2, may collectively be more problematic than the pain itself.

Figure 2. A holistic representation of chronic pain and commonly experienced consequences.
Chronic pain often prevents sufferers from behaving in ways that are consistent with the self-script, a script determined by their values. For example, people who value independence may struggle mentally with perceptions of incompetence and loss of self-worth in having to rely on others for help with shopping, looking after children, or even getting dressed, during a flare up of the condition (Baker, Gallois, Driedger, & Santesso, 2011; Soklaridis et al., 2011). In other instances, those who normally oppose drug use may battle internally with contravening their values to obtain pain relief via medications (Eaves, 2015), and may potentially encounter external ‘drug abuser’ stereotyping and stigma (Brooks et al., 2015). For many, a substantial sense of identity loss ensues following work reduction or termination of their former career (Wuytack & Miller, 2011).

The changes and loss brought about by chronic pain interrupt the patient’s view of their capabilities, identity, and understanding of the self in relation to the world (Arroll & Howard, 2013; McMahon, Murray, & Simpson, 2012). Such losses or breakdown of self-script are often distressing, creating a destabilization of the sufferer’s internal world and upsetting stability of the psyche (Heath, 2014; Stuthridge, 2017), though the process is often noted as a precursor to the rebuilding of the self (Arroll & Howard, 2013; Stuthridge, 2017). Humans rely on the consensus and verification of socially relevant others in forming perceptions about their own identity (Jorgensen, 2010) and in establishing attitude norms (Smith & Mackie, 2007). Social validation of the pain experience may help buffer pain-induced loss and destabilization by allowing for social communion, unity, and highlighting aspects of shared identity (Rimé, 2013). The ability to tell one’s story is also an important mechanism for re-organisation and formation of the new self following chronic illness, and helps the sufferer create meaning in the experience.
Allowing opportunities for this narrative process, together with healthcare professionals’ validation of uncertainty and loss experienced by their pain clients may, therefore, be beneficial (Deshaies & Hernandez, 2011; McMahon et al., 2012).

**Proposed Benefits of Pain-Validation in Therapy**

In addition to its many applications for stress reduction, pain-validation should be considered with regard to its value in pain management interventions. Current therapies often incorporate, to varying degrees, validation of painful experiences (Gilbert & Procter, 2006). However, academic literature is yet to explicitly identify pain-validation as it appears in the therapeutic context. Elements of pain management therapies that constitute pain-validation include developing the therapeutic alliance, psychoeducation, and pain education. Health professionals, broadly, may observe beneficial outcomes through purposefully incorporating such pain-validation techniques within the therapeutic encounter.

**Therapeutic alliance**

One of the limiting factors to the efficacy of therapeutic interventions is the level of patient compliance or adherence (Fuertes, Anand, Haggerty, Kestenbaum, & Rosenblum, 2015). Research indicates that poorer relationships with healthcare professionals relate to lower adherence to treatment plans (Fuertes et al., 2015), while healthy alliances relate to higher treatment adherence (Dorflinger, Kerns, & Auerbach, 2013). This points to the benefits of developing rapport and a high-quality relationship between patient and professional, such that the patient feels heard and understood (Dorflinger et al., 2013; Fonagy & Allison, 2014). By validating pain through acknowledging the experience, and demonstrating belief in,
and understanding of the patient, the therapist shows that (s)he is *mentalizing* the client’s experience. Mentalization is an ability to understand the feelings, motivations, and behaviours of the self or others from their subjective perspective or mental state (Fonagy & Bateman, 2007). In terms of chronic pain, mentalizing involves understanding the cognitions and emotions held by the patient with regard to their pain, allowing for comprehension of the broad impact of pain and its consequences on the patient. Within the therapeutic relationship, mentalizing indicates to the patient that their experience is worthy of active consideration, enabling them to feel safe to discuss their pain and difficulties without fear of reprisal or judgement (Fonagy & Allison, 2014). Pain-validation is an active means of communicating mentalization, and is central to establishing patient trust in the therapist.

**Pain education and psychoeducation**

Another way for the therapist to demonstrate their capacity to mentalize the patient’s experience is by indicating an understanding of the deeper implications that having pain may have held for that patient. Those with chronic pain commonly feel a range of negative emotions including depression, fear, frustration and anger (Street, Makoul, Arora, & Epstein, 2009). Furthermore, experiences of injustice toward pain by social others are associated with adverse pain outcomes and resistance to change by individuals with pain (Sullivan et al., 2008). Pain-validation, then, offers a clear benefit in that it acts to create belief and acceptability, which can be demonstrated through the provision of pain education. For example, it may be helpful for the patient to hear that they are not alone in their suffering, nor abnormal in their condition, with thousands of people sharing similar symptoms or difficulties in achieving diagnoses. Rather than feeling defective, different and
isolated, this form of validation allows the individual to maintain a sense of shared humanity, the importance of which is described as a core component of self-compassion (Neff, 2003).

Where appropriate, validation of pain symptoms may also be demonstrated by pain specialists providing pain education that offers alternative possible explanations for pain, particularly in the absence of scanning or laboratory-based evidence. Central sensitization is one such phenomenon theorised to account for continued stimulus sensitivity, and consequent pain signalling by neurons, even when injury and inflammation is no longer present (Baliki & Apkarian, 2015). Central sensitization can occur as a result of neural re-wiring at the site of injury, which may increase the excitability of neurons, or the number of neural synapses in the region (Baliki & Apkarian, 2015; Kuner, 2010). Imaging technologies designed to reveal damage at the level of tissue and bone cannot detect aberrant neural activity. Nonetheless, the activation of highly potentiated neurons continues to send signals that the individual perceives as pain (Kuner, 2010). Learning about such possible reasons for otherwise unexplained pain may provide validation regarding the ‘felt’ experience, supporting patients who may have previously perceived practitioner judgements or disbelief regarding claims of pain.

Efforts made by the therapist to convey understanding of physical, psychological, and social difficulties (such as pain-invalidation in social circles) is fundamental to building the patient-provider relationship in the patient-centred approach (Street et al., 2009). Sharing knowledge of general experiences reported in pain literature, potentially familiar to the patient, may provide further evidence of the therapist’s ability to understand the complicated layers of distress associated
with having a chronic condition. The therapist may choose to offer psychoeducation about the inability of social others to appreciate pain-related fatigue, the seemingly inconsistent appearance of pain symptoms in specific conditions, or the secondary effects of pain medications. This shared understanding may serve to enhance patient trust in the therapist and open the way for further communication and learning (Fonagy & Allison, 2014; Street et al., 2009).

Current pain management interventions often include modalities such as Cognitive Behavioural Therapy (CBT) and Acceptance and Commitment Therapy (ACT), that involve cognitive re-framing or behavioural modification and will, by definition, involve change (Mann, LeFort, & VanDenKerkhof, 2013). Re-framing and behavioural techniques are designed to arrest catastrophizing directions of thought, improve estimations of efficacy for pain-coping, increase general self-efficacy, and build confidence for increasing functional mobility, and reducing pain-avoidance (Dorflinger et al., 2013; Okifuji & Turk, 2015). It is worth noting here that change may be difficult for several reasons. For example, both ACT and cognitive therapy techniques involve effortful and active practice of conscious awareness of thoughts and feelings, while remembering and applying newly learned strategies (Teper, Segal, & Inzlicht, 2013). Even more uncomfortably, change requires the mental exertion of pushing through boundaries of fear, deconstructing old realities, and disrupting maladaptive ‘scripts’ or schemas, which once provided a sense of psychological stability (Stuthridge, 2017). Hence, the prolonged effort and even discomfort necessary to instigate and adhere to change requires a degree of internal motivation. Such motivation may fail if the patient’s fundamental struggle (having chronic pain) remains unacknowledged. Indeed, Linehan (1997) warns of a client’s need to feel validated prior to moving forward with
interventions, underlining the problem that may occur if this need is unmet, whereby clients can remain ‘stuck’ feeling invalidated, and resist treatment. Attempts to encourage change in clients at this stage may be experienced as dismissive of the client’s feelings (Linehan, 1997). Thus, pain-validation appears to be an important first step in pain management therapy by way of acknowledging the present experience of the client, and paying recognition to the difficulties in transitioning to life with chronic pain (Deshaies & Hernandez, 2011). Given the potential barriers to pain management interventions (Bair et al., 2009), the dual benefit of pain-validation in fortifying the therapeutic relationship and increasing patient motivation to embrace cognitive, behavioural, and affective change may go a long way toward improving treatment adherence (Bair et al., 2009; Street et al., 2009).

Conclusion

To date, pain-validation has remained a relatively abstract and undefined construct, and its importance in alleviating and protecting individuals from the stresses of chronic pain has not been comprehensively explored. We have attempted to address this gap, firstly by identifying some of the central elements of pain-validation, and defining the construct as communicating belief and acceptability of the sufferer’s expressions of pain. Pain was also explored in the context of Hobfoll’s (1989) COR theory of stress, with indications that much of the stress associated with having chronic pain relates to the potential loss of resources, namely financial losses, reduced connections with friends, lowered self-esteem, depleted physical capability, and lost status at home or work; as well as a reduced capacity for resource gain. Social support was recognized as an important resource for coping
with chronic pain, as was the buffering effect of pain-validation against negative emotions.

In addition, the potential value of pain-validation in therapeutic interventions was highlighted, bearing in mind that changes (in thinking or behaviour) require energy and motivation, which may be undermined by a failure to first acknowledge the current status of the individual. The efficacy of pain management interventions may be improved through therapists being able to identify and discuss pain-invalidation experienced by the patient at the level of the self, in communications with healthcare professionals, and in their relationships with socially significant others. Future researchers investigating the efficacy of pain management interventions may benefit from a design that measures patient adherence to interventions, and compares compliance to measured levels of pain-validation.

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CHAPTER 3

Study 1: Thematic Analysis of Chronic Pain Narratives

Study 1 was conducted to provide an understanding of the need for pain-validation, and clarification of its dimensions, through the narrative voices of those with chronic pain. To enable this enquiry, a thematic analysis was undertaken, with a dual purpose. At the foundation of creating a robust measure, the researcher must first be clear about the definition of the construct under examination (Hinkin, 1998; Springer, Abell, & Hudson, 2002). Thus, the first goal of thematic analysis was to reveal the experiences, feelings, and attitudes of individuals with chronic pain in order to understand from the patient perspective what it means to be validated or invalidated when expressing pain. The resulting information contributed to the formation of a construct definition of pain-validation (Chapter 2). The second intention was to examine chronic pain narratives for themes related to pain-validation, invalidation and over-validation, in order to create a range of items that wholly represent the pain-validation construct, for use in developing a Pain-Validation Scale.

Items for a new psychometric instrument are typically developed through focus groups, literature review, or interviews (Onwuegbuzie, Bustamante, & Nelson, 2010). However, it was reasoned that drawing from a collection of pain narratives in the available literature offered inherent benefits to item generation. The first advantage is that the number of individuals ‘heard’ through this type of analysis is likely far greater than would be available in a focus group or interview
approach. Secondly, conducting interviews or focus groups would typically involve collecting qualitative data from local participants only, while the thematic analysis included qualitative narratives from many countries across the world. Thirdly, the number and range of articles here examined included narratives from a more diverse range of pain conditions, potentially improving the degree to which items represent pain-validation across the pain population.

This chapter includes a manuscript (Nicola, Correia, Ditchburn, & Drummond, 2019), as published by a peer-reviewed journal, reporting on the method and outcome of a thematic analysis performed on narratives of individuals with chronic pain. The original systematic search, and analysis of an eventual 334 articles relevant to pain-validation, was performed in March 2017. To both update and verify the study findings, a renewed search was performed in March 2019, using the same systematic search strategy, with a resulting 97 additional articles deemed suitable for analysis. In order provide a succinct discussion on a focal topic, the thematic analysis in the following paper reports, essentially, on themes related to the invalidation of pain, which constituted the major proportion of the narrative literature. It should be noted, however, that some indications of over-validation were noted and coded in the analysis for use in the development of scale items, detailed further in Chapter 4.
Chapter 3: Thematic Analysis

Chapter References


Invalidation of Chronic Pain: A Thematic Analysis of Pain Narratives

Melinda Nicola, Helen Correia, Graeme Ditchburn, and Peter Drummond

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Invalidation of chronic pain: a thematic analysis of pain narratives

Melinda Nicola, Helen Correia, Graeme Ditchburn, and Peter Drummond

Abstract

Purpose: Many people with chronic pain report feeling disbelieved or disparaged by others regarding their pain symptoms. Given the widely documented relationship between stress and pain, the importance of identifying psychosocial stressors such as pain-invalidations is apparent. This study was designed to identify and illustrate using first-person narratives, the effects of pain-invalidations by the self, family, friends, and healthcare professionals, toward individuals with chronic pain.

Method: A systematic search of 5 databases was performed using a search strategy consisting of terms related to pain-invalidations. A review of 431 peer-reviewed journal articles, containing narratives from a pool of over 7,770 study participants with a wide range of pain conditions, was conducted, followed by a thematic analysis to establish themes of invalidation experienced by those with chronic pain.


Conclusion: Themes were largely interrelated and, together, build a picture of how levels of perceived social unacceptability of pain symptoms can impact on the emotional state and self-image of those with chronic pain. As such, pain-invalidations may potentially impede help-seeking or the effectiveness of therapeutic interventions.
Keywords: chronic pain; invalidation; narratives; thematic analysis; identity

Introduction

Pain literature is replete with narratives of individuals reporting invalidation of their pain experience by others. This failure to validate a person’s expression of suffering indicates a potential denial of social support, depriving those in need of an important resource for coping with pain and its related stresses [1], which often extend beyond physical suffering. For example, individuals commonly face the stress of uncertainties around their condition – not knowing the primary cause of pain, how much pain they will endure, or how long each episode will last. In addition, these individuals may experience stress through frustration at the limitations imposed by their pain condition [2–4], and a degree of dependence on others may result in guilt [5,6] or shame [7–8].

The collective literature exploring such themes indicates that pain-invalidation is experienced as a rejection of belief or acknowledgment of one’s pain experience [9–11]. Further, validation of pain has been framed as an empathic response, versus a non-empathic response in the case of pain-invalidation [12]. Some chronic pain sufferers have reported a sense of being disbelieved or disparaged within a doctor’s consultation, particularly in cases where no organic cause for the pain could be found [13,14]. The invalidation of one’s pain can carry over to important social relationships with friends and work colleagues as the sufferer remains in limbo between classifications of having a legitimate pain condition, or otherwise being healthy [15]. A range of negative consequences can arise from the invalidation of an individual’s pain experience including emotional distress in the form of guilt, shame, anxiety and depression, as well as threats to moral integrity and perceived
social resources for coping [16–18]. Empirical studies exploring the topic also indicate the damaging effects of invalidating pain, resulting in both psychological and physical detriment to the afflicted individual. For example, one study on people with fibromyalgia noted that the degree of discounting a pain condition by socially significant others was linked with poor functioning for the afflicted individual, both in physical and social domains, and was associated with poorer mental wellbeing [19]. Similarly, in studies on patients with chronic low back pain, discounting by one’s intimate partner was directly related to functional impairment [20]. In a further study comparing styles of communication in nursing consultations, patients’ negative affect and pain intensity were reduced through validating communications, compared to levels reported by patients in the invalidating condition [21]. Such studies suggest that pain-invalidation may be an important factor to consider with regard to how well (or poorly) chronic pain patients progress.

To date, a dearth of literature exists that adequately defines and operationalises the construct of pain-invalidation. Our aim in this study was to draw from pain narratives in peer-reviewed literature, to generate a comprehensive collection of themes relevant to people’s experiences of feeling invalidated regarding chronic pain. An additional aim was to explain these themes, revealing the effects of pain-invalidation on the lives of those with chronic pain; specifically, how pain-invalidation may contribute to psychological distress, and its bearing on perceptions of social support.

**Method**

Pain-invalidation literature was extracted from 5 electronic databases: Scopus, PubMed, CINAHL, Medline, and PsycINFO. A systematic search of each database
was conducted in March of 2019, to retrieve journal articles containing narratives of people with chronic pain.

**Systematic search**

A preliminary literature review was used to develop a list of search terms relevant to pain-invalidation. A systematic search procedure incorporating the search terms was generated over several meetings with a subject librarian, and refined in further meetings among the research team. Given that the search would be delimited by the terminology used in the primary articles, the range of search terms employed for this study was deliberately large and over-inclusive. The final search strategy is listed in the Appendix, showing its application to the Medline database as an example. After removal of duplicates from the initial pool, articles were scanned for obvious exclusion criteria. Our goal was to examine pain-invalidation narratives in individuals aged between 18 – 65 years who experienced chronic, non-cancerous pain. Thus, literature external to these criteria was screened out, together with articles deemed widely off topic, and a small number of unavailable studies. Finally, only the accounts of individuals with chronic pain were of interest in this analysis, as opposed to statements by their family members, doctors or employers. Thus, articles not including such first person narratives were also excluded. A flow chart of the search and screening process is presented in Figure 1.
Figure 1. Systematic search and screening procedure to retrieve narrative articles for analysis.
**Thematic analysis**

The resultant collection of articles were read, and themes pertaining to the level of invalidation experienced by those with chronic pain were identified within the narrative accounts. Qualitative data was coded into initial theme-relevant concepts, represented as nodes using NVivo software 11.4.0. As recommended by Braun and Clarke [22], many more coding categories were allocated in the early stages than would eventually appear as themes. Articles were coded until themes related to pain-invalidation reached saturation. The remaining articles were also read to ensure that all themes related to pain-invalidation were captured, and to identify any potentially recurrent, additional themes. The numerous nodes contained overlapping ideas, though their interwoven relationships were better distinguished when arranged as a thematic map. Visual mapping enabled the conceptualisation of distinct, higher order themes and the organisation of subthemes. As described by Braun and Clarke [22], the extraction of themes did not occur in clean, linear steps, but rather as an iterative process whereby the tabulated list of themes and visual map were continuously consulted and compared against readings of narrative exemplars from the given nodes.

To enhance confirmability [23], a subset of forty articles was randomly selected from the corpus of articles using random number generation, and the narrative coded by a second researcher (HC). The same inductive coding process was used, with the multi-step iterative process involving peer debriefing, testing for referential adequacy by comparing narrative exemplars, and the development of a coding framework. Themes were identified and clarified using a similar multistep process, with peer debriefing and consultation with the research team facilitating
consensus in the refinement of themes and subthemes. Major themes and their component subcategories were then finalised between the researchers.

**Participants**

Articles included in the thematic analysis contained narratives from a pool of over 7,770 adult participants. Over 20 nationalities were represented within the pool of participants, as was an extensive array of chronic pain conditions, with many participants having multiple pain conditions. Musculoskeletal, neuropathic, arthritic, headache, and orofacial pain were among the numerous pain conditions represented. Across the range of studies participants were recruited from a variety of sources including inpatient and outpatient hospital and health clinics, rehabilitation or pain management programs, and support or advocacy groups. Narrative data in the articles was typically collected in the form of structured or semi-structured interviews, focus groups and therapeutic writing exercises.

**Findings**

**Pain-invalidation themes**

Five major pain-invalidation themes arose including ‘Not Being Believed’, ‘Lack of Compassion’, ‘Lack of Pain Awareness / Understanding’, ‘Feeling Stigmatised’, and ‘Critical Self-judgement’, shown in Table 1. Themes were closely connected and interwoven, with exemplar narratives often illustrating multiple linking ideas.
Table 1. Development of major themes and subthemes through coding in the thematic analysis of pain narratives.

<table>
<thead>
<tr>
<th>Main Themes</th>
<th>Subthemes</th>
<th>Example Nodes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not Being Believed</td>
<td>No evidence - faking</td>
<td>HCP. No evidence of pain</td>
</tr>
<tr>
<td></td>
<td>Dismissed as psychological</td>
<td>HCP. Doctor does not believe</td>
</tr>
<tr>
<td></td>
<td>Look too well</td>
<td>SO. Others think patient is faking</td>
</tr>
<tr>
<td>Lack of Compassion</td>
<td>Doctor not spending time</td>
<td>HCP. Doctor not spending time</td>
</tr>
<tr>
<td></td>
<td>Doctor not listening</td>
<td>HCP. Doctor lacks empathy / understanding</td>
</tr>
<tr>
<td></td>
<td>Doctor mistreating patient</td>
<td>HCP. Feeling mistreated by doctor</td>
</tr>
<tr>
<td></td>
<td>Friends don’t want to hear</td>
<td>SO. Friends don't want to hear</td>
</tr>
<tr>
<td></td>
<td>Society does not care</td>
<td></td>
</tr>
<tr>
<td>Lack of Awareness / Understanding</td>
<td>Loved ones do not understand pain</td>
<td>SO. Loved ones don’t understand</td>
</tr>
<tr>
<td></td>
<td>Minimizing seriousness of condition</td>
<td>SO. Employer not understanding</td>
</tr>
<tr>
<td></td>
<td>Own fault</td>
<td>SO. Minimizing the seriousness of illness</td>
</tr>
<tr>
<td></td>
<td></td>
<td>SO. People don't know how to help</td>
</tr>
<tr>
<td>Feeling Stigmatized</td>
<td>Drug abuser</td>
<td>SO. Seen as lazy</td>
</tr>
<tr>
<td></td>
<td>Malingering</td>
<td>SO. Feeling stigmatized</td>
</tr>
<tr>
<td></td>
<td>Lazy</td>
<td>SO. Others think drug abuser</td>
</tr>
<tr>
<td></td>
<td>Whiner</td>
<td>HCP. Suspected drug seeking</td>
</tr>
<tr>
<td>Critical Self-judgement</td>
<td>Feel like a burden</td>
<td>Self. Moral failure</td>
</tr>
<tr>
<td></td>
<td>Others have it worse</td>
<td>Self. Feeling shame or guilt</td>
</tr>
<tr>
<td></td>
<td>Hiding pain</td>
<td>Self. Feel like a fraud</td>
</tr>
<tr>
<td></td>
<td>Not performing socially expected roles</td>
<td>Self. Feel like a burden</td>
</tr>
<tr>
<td></td>
<td>Not a good enough parent, partner, friend</td>
<td>Self. It could be worse</td>
</tr>
</tbody>
</table>

Note: HCP = themes pertaining to healthcare provider; SO = themes pertaining to social others; Self = themes pertaining to the self
Chapter 3: Thematic Analysis

Not being believed

One of the most difficult aspects for many living with all that pain entails is having their suffering denied. Lack of belief by others was the most prominent theme throughout the pain narratives, and at the foundation of a vast array of pain-related issues. For instance, those interviewed frequently shared that doctors could not find medical evidence through diagnostic testing or on scans that may explain their painful condition. Thus, patients’ claims of pain were not always believed by healthcare professionals.

Patient: “I guess my biggest frustration was just how dismissive doctors were. [They] would literally say that it’s probably just in your head...” [24,p.6]

Patient: “The second physiotherapist I saw basically told me that the pain was in my imagination. So I had one appointment with him. I’m in enough pain not to be able to tolerate people who are telling me it’s not real, you know, because it is real.” [25,p.3]

The pain patient’s integrity appeared to be brought into question, with some having to prove the legitimacy of their suffering.

Patient: “…my family doctor at one point did not understand the pain that I was in. I actually had to go to a pain specialist and the pain specialist had to write a letter to my family doctor and said ‘this girl really does have pain’ and I was very frustrated...” [26,p.18]

In the absence of a clear medical diagnosis, family and friends were often sceptical toward the individual in their experience of pain, and indicated annoyance.
The lack of belief from the social network was demoralising, and a sense of unacceptability of experience was apparent.

Patient: “…Because don’t forget one thing: when you are outside, when people look at you and tell you: ‘Go to work, instead of stealing money from the health insurance!’ It’s not nice… Even when you talk with your nearest, they tell you that you don’t have any disease…” [27,p.205]

There are numerous reasons why people with pain may be disbelieved. In many cases a lack of medical evidence made diagnosis difficult, leaving professionals and family members in doubt about the presence of genuine illness for those in pain. Additional issues fueling suspicion and mistrust by socially significant others were the changing nature of symptoms in the pain sufferer, the presence of ‘good days’ amongst bad ones, and the failure of medications to adequately remedy the situation.

**Lack of compassion**

Another theme underlying some pain patients’ experiences was a general lack of compassion from others in the community. Compassion, as described by experts in the field, is defined as a sensitivity to distress or discomfort experienced by the self and others, together with an intention toward its relief [28]. Some patients expressed distress and indignation at the perceived lack of compassion in their experiences with certain healthcare practitioners.

Patient: “…because the way that they treat you is absolutely disgusting from point to point, there’s no…you’re treated as a number, you’re not treated as a person.” [25,p.3]
Patient: “But you go to the doctor and it’s...well, you don’t seem to get any help at all. They never asked me how I was getting on or anything. There was just nothing, which I thought was quite amazing really!” [29, p.4]

Such statements indicate a lack of compassion in that patients perceived a lack of empathy on part of their healthcare professional.

Patient: “In many ways I have missed that someone took care of me. Because no one cares about my health. My GP just writes out prescriptions, and then- was it something else? So, that is what I hope for really. To be taken care of... ” [30, p.7]

Moreover, compassion was not always available from members of the community, employers, and friends, with the underlying message being that it was not beneficial to talk about one’s pain because others would likely run out of patience. Instead, many put on a façade, masking their discomfort in order to remain acceptable and maintain harmonious relationships. Without compassion from the social network, those in pain described themselves as feeling isolated, and left unable to share their burden.

Lack of pain awareness / understanding

In Western society the onus is on the individual to achieve and maintain health [31]. Thus, people with ongoing pain are often regarded as ‘at fault’ for their prolonged illness status. Examples were reported by numerous pain patients, with some viewed as not having tried hard enough to remedy the situation or not following the doctor’s recommendations, as though being unwell was a passive choice made through the patient’s failure to act accordingly. Many expressed that close others
could not relate to their pain and associated difficulties, particularly when outward evidence did not exist. The resultant impact may be felt as stress within the relationship.

Patient: “Well, it’s hard when your partner doesn’t completely understand, um, what’s happening with you. I mean, if there’s no obvious physical sign, like some sores or something happening, right, it’s really hard to explain to somebody that something is painful…”  
[32,p.e246]

A lack of understanding about the nuances of pain were also conveyed with regard to the limitations imposed by the pain condition, and the individual’s inability to engage in activities as they normally might.

Patient: “People can’t see it, and it’s hard to explain. Doing something one day and not the next, sometimes I’d worry, you know, that asking for help, well, that it sounds like an excuse…”  [29,p.5]

Feeling stigmatised

Stigmatisation was a common theme arising in the narratives, indicating pain-invalidation. Those with pain often found themselves labelled in various ways by family or community members. Those without pain were typically unaware of the changing and unpredictable nature of symptoms, with the inconsistent levels of capability to perform work or social activities creating doubt about the genuineness of the sufferer’s condition. The lack of visible evidence of injury or illness made it difficult for others in the social network to accept the individual’s pain symptoms.
as legitimate. Some who sought pain medication felt that they were stigmatised, being perceived by others as a drug abuser.

Patient: “They [ER staff] said, “Well we know that you’re on a lot of pain medicine, so we can’t give you any.” I said, “I didn’t ask you for any. I just want to know what’s wrong with me.” So I almost felt like, I felt like I was being treated like a junkie in the emergency room when I was in an accident because they found out I was on pain medicine…” [33,p.18]

Patient: “I kept showing them, “This is the bottle of morphine prescribed back in May. Look! It’s almost all here. I’m not taking it.” Like I felt I had to defend . . . I was very insulted.” [34,p.6]

A number of interviewees felt that others believed they used their pain to achieve secondary gains such as attention, sympathy, avoidance of tasks and commitments, or financial benefits. The social stigma attached to labels such as ‘hypochondriac’, ‘drug abuser’, or being ‘weak’ appeared to undermine the self-image or moral integrity of some individuals, potentially creating an additional psychological stressor.

Critical self-judgement

A sense of moral failure was prevalent throughout the literature, with critical self-judgement present in many narratives. This theme relates to invalidation at the level of the Self. Narratives that indicated a lack of acceptability and compassion for one’s own pain experience, and resultant limitations, were deemed representative of pain-invalidation. For some, critical self-judgement rather than
compassion stemmed from these limitations, conveyed in the narratives as a sense of failing to meet personal expectations because of the pain.

Patient: “… I can't do like the kids need help with their homeworks occasionally, well if Dad's upstairs in a darkened room with a pounding head, well, he's not there for them.” [35,p.30]

Patient: “Over and over again, she came and wanted me to play... I dread the day she’ll stop asking me since I am almost never ever able, manage or have the energy to play with her. To not be able to be the mum I want to be is the absolute worst in this situation.” [36,p.6]

Far from adopting a position of self-compassion and tolerance of the fallible human condition, numerous pain patients considered themselves a burden, expressing deep guilt at the impact on the lives of others. A number of people with chronic pain went to great lengths to uphold their perceived duty and comply with moral values. The dissonance between behaviours and moral values, however, often involved additional psychological distress.

Patient: “It’s a big deal for me to have to go on these medications because I felt very bad. You know you hear all this stuff about narcotics and stuff so I felt like I was a bad person for a long time actually.” [33,p.18]

Self-denial of permission to have illness and allow for limitations, are typified in these examples. Pain-invalidation by the self is recognised here as a construct featuring self-blame and a failure to meet self-imposed standards.
**Validating experiences**

In contrast to the numerous experiences of pain-invalidation, some patients had found supportive healthcare practitioners who believed their pain communications. Patients who were validated in the patient-practitioner relationship expressed a sense of relief, safety, and being able to move forward.

Patient: “I was really worried. I don’t want to leave this hospital in a wheelchair, I told the doctor. But he reassured me and I’m very thankful that I could ask all of my questions.” [37,p. 3]

Patient: “It’s good that someone’s actually taking it seriously ... it’s been great, she actually spends some time and listens to what I’ve got to say, you know, get a full history of it and, you know, and make, and make a note herself how I’m progressing with it and things like that ... I trust her.” [38,p.311]

In social support groups, the opportunity to connect with others sharing similar experiences offered validation in the sense that communications about pain were met with compassion and acceptance.

Patient: “I felt that the others in the group shared my experiences. It wasn’t just me who struggled with this, several of us did ... It felt good.” [39,p.2523]

**Themes indirect to pain-invalidation**

Additional themes that were related, though not necessarily a direct indicator of pain-invalidation levels, were also revealed in the narratives. These topics warrant
consideration since they too form part of the complex of factors that contribute to
the overall psychological outcomes and experiences that occur for many with
chronic pain.

*Threats to self-image*

A number of subthemes in this category such as moral integrity, moral failure, and
feeling like a burden or fraud, relate directly to pain-invalidation. They also
contribute to the higher order theme of self-image, together with the more general
subthemes expressed in the narratives of people with chronic pain including loss of
self-esteem, and loss of independence. The consequences of having pain are seen
to reach beyond the physical suffering, with the failure to fulfil their roles
undermining their sense of worth. Emotions such as frustration, depression, anger,
shame, guilt and sadness were expressed repeatedly.

Patient: “*It’s devastating to be a married 27 year old with a family of my
own and be dependent of my parents to make my daily life function. It
really gnaws my self-esteem.*” [36,p.6]

The narrators must absorb injury to their self-image as they stand aside
watching others perform the role they once played.

*Loss of identity*

The presence of ongoing pain penetrates the lives of those afflicted on multiple
levels and can uproot the core of the previously valued self. Once defined by their
active careers, status as financial providers, ability to run a household, and the type
of parent, partner, or friend they wanted to be, people’s identities were often
contingent on activities that they could no longer perform due to pain.

Patient: “My ability to do extracurricular things like my walking distance has shrunk. I can’t cross-country ski anymore. It’s just too painful and snowshoeing I can’t do. And sitting for long periods of time, it becomes very uncomfortable. I had to give up part of my job... everything seemed to shrink, what I could do and couldn’t do.” [40,p.5]

Liminal existence is a recurrent theme in pain narratives, with the individual stuck somewhere between the previous capable self, and the current self, bound by pain’s limitations. Underlying the experience there is a discernible grief over the loss of one’s capabilities and identity. To complicate the issue, the very nature of chronic pain often leaves the individual in a state of uncertainty, not knowing how temporary or permanent their current incapacities will be. Such individuals struggle with the frustration and displacement of living in limbo, and an inability to properly process the grief of loss, while hope still remains for the return of the lives they once knew.

Isolation

To belong and remain in contact with others in society is a fundamental human need [41]. For those with chronic pain, the desire to maintain connections may be enhanced as others in the social network become a resource for coping, or even for achieving daily tasks when pain interferes with physical independence. Isolation from the social network through loss of employment, and loss of significant relationships reduces opportunities for support and interaction, and is experienced as loss and loneliness. Pain drains many individuals of the energy to commit reliably to employment, or to planned activities with friends and family. Thus,
many with pain report a general withdrawal from social engagement, with outings typically being too taxing. As a result, individuals often experience a reduction in the number of friends who are motivated to maintain a relationship.

Online blogger: “The few relationships I had left eroded into a toxic sludge of confusion and misunderstanding.” [42,p.5]

In summary, accounts of those with pain depict the desire to feel connected to others, and the absence of such shared associations represent another important stress factor at a time when support is most needed.

Discussion

This study was designed to uncover themes in narrative literature related to pain-invalidation, with the aim of identifying the sources of invalidation, and how it appears in people’s experiences of chronic pain. An additional aim was to investigate the effects of pain-invalidation on the lives of those afflicted with pain; and how pain-invalidation, may contribute to psychological distress. Five major themes were extracted, including Not Being Believed, Lack of Compassion, Lack of Pain Awareness / Understanding, Feeling Stigmatised, and Critical Self-judgement. These themes were reflected in a number of other studies examining topics related to the experiences of chronic pain patients [43–46]. Pain-invalidation themes appear to be closely inter-connected. For example, patients ‘Not Being Believed’ may give rise to a ‘Lack of Compassion by healthcare professionals or socially important others; and ‘Lack of Awareness / Understanding’ about the nature of a pain condition may prevent an appreciation of requirements around pain medication, or being forced out of work – leading to patients ‘Feeling Stigmatised’;
while ‘Feeling Stigmatised’ as a drug abuser or malingerer can imply a degree of moral failure, potentially increasing ‘Critical Self-judgement’. Higher order themes under the banner of Pain-invalidation all share a common underlying thread, suggesting a lack of acceptability of the sufferer’s experience. This finding overlaps to a degree with other qualitative research [9], which concluded that the defining elements of pain-invalidation were the discounting of, and a lack of understanding about, an individual’s pain.

An additional concept exemplified by the narrative themes is the struggle to maintain acceptability of the self. The outcomes of being in pain may include an inability to perform socially acceptable roles, requirements for narcotic medications, or needing financial aid. The psychological stress of threats to moral integrity and perceived self-image are understandable, given that self-image is an asset that humans strive to protect [47]. Difficulties in maintaining acceptability of the self are evident in themes (both directly and indirectly related to pain-invalidation) arising from the narrative analysis. Self-invalidation presented as a lack of compassion for one’s own pain, disregarding its importance, playing down the symptoms, and avoiding pain talk, which patients themselves labelled as ‘whinging’ [48]. At the base of self-invalidation were several source emotions such as guilt over knowing about others with a more serious illness [49,50], self-annoyance for failure to ‘get over’ the pain and engage in socially meaningful activities [51,52], and shame coupled with self-doubt in individuals without a medical explanation for their pain who are left to question whether the illness is indeed psychological [53].

Literature on the topic has raised the problems inherent in disregarding one’s own pain, warning about its potential to interfere with rehabilitation progress and
induce relapse when the individual ignores pain symptoms and pushes the body beyond current limits [54]. From a grounded theory developed through the study of 19 women with nonmalignant chronic pain, Howell [55] posited that the grieving process connected to the loss of the former self can be aided by validation, and recommended that healthcare professionals should take care to avoid communications that lay blame on the client for their current condition. Congruent with previous research [3], our findings indicate that early stages of pain-management interventions should focus largely on breaking down shame, stigma, and encounters of social invalidation. Regrettably, the need to continually prove oneself as legitimately suffering often interferes with patients’ progression toward achieving wellness [56]. For example, having the experience of pain denied did not appear to motivate patients’ independent activity, nor propel a return to normal function. Rather, disbelief by social and professional others forced many sufferers to curtail displays of functional improvement or wellness behaviours on their ‘good days’, for fear of looking too well and increasing societal doubt about the presence of illness. Invalidation then, can produce the first barrier on the patient’s journey to wellness, with any small improvements being hidden instead of celebrated.

The degree of pain-validation communicated by healthcare professionals may also contribute to treatment outcomes, with studies suggesting that stronger patient-provider alliances are associated with greater adherence to treatment plans by patients [57,58].

Themes that were indirectly related to pain-invalidation included two closely linked concepts of ‘Threats to Self-Image’ and ‘Loss of Identity’. Pain and loss of functional mobility often interfere with the individual’s ability to meet work or family role requirements to the same capacity as previously performed. Narratives
revealed strong links between an individual’s work or family role and their self-concept, with a forced removal from those roles being described as a loss of identity. Stories of those with pain reflect discrepancies between living with pain’s current limitations, and living in a manner which adheres to the narrator’s values of the ideal self – with many such values corresponding to perceptions of social norms and expectations. Enforced deviation from one’s valued self-image and identity (especially without a socially ‘validated’ reason) may have direct physiological effects on the body. Indeed, research indicates that shame resulting from perceived negative social judgement activates pro-inflammatory response systems [59]. Such threats to the self-concept, therefore, may conceivably result in exacerbated experiences of pain.

Another important theme indirectly related to pain-invalidation was the problem of ‘Isolation’. Loss of employment, whether full or partial, necessarily excludes the individual to some degree from their former social network in the workplace. In addition, the unpredictable and fatiguing nature of pain makes social engagement difficult, further exacerbating isolation. Patients also admitted reluctance to discuss their pain with others even when present in social settings, for fear of seeming tedious or complaining, and thus opportunities for communal support were lost. Researchers of ‘exclusion theory’ contend that the threat of social exclusion can induce anxiety, and suggest that any personal facet indicating inadequacy or inability by the individual to contribute adequately to the group increases the potential for social rejection, and therefore creates anxiety [47]. Isolation can thus be understood as another notable cause of emotional stress, potentially producing a cascade of effects which may manifest as increased physical pain.
A noteworthy point is that not all people with pain experience invalidation, and that many individuals feel well supported by others in the community [60,61]. Moreover, certain types of pain-invalidation may be more readily experienced in certain pain conditions than in others. For example, conditions with medical evidence may be more ‘acceptable’ than pain complaints by sufferers of invisible or poorly understood illnesses such as fibromyalgia [9]. This study did not involve analysis of the data by pain condition, nor did it examine possible differences between those with single or multiple conditions. Thus, the degree to which pain-invalidation themes apply within particular pain conditions requires further study.

This study aimed to include a range of nationalities, pain conditions, age, and gender, such that the themes uncovered would capture major forms of pain-invalidation endured by those with pain. One limitation to consider, however, was that the weight of literature derived from the search was biased toward Western cultures, with only a few studies examining other perspectives. Thus, there may be pain-invalidation themes important to these under-represented cultures that are yet to be revealed. Another limitation of this study is that analysis was performed on secondary rather than primary sources of data. As such, analysis was limited to the qualitative data made available by the authors of each narrative paper. It is also important to note that themes were discovered through the examination of pain patients’ accounts. Patients’ perceptions may not necessarily reflect the actual opinion of the third party, and some actions or comments by others intending to help or inform may have been misconstrued as invalidating the narrator’s pain. Ultimately, however, the purpose of this study was to reveal the felt experience of the patients themselves, and to understand it in the context of their own reality,
since that perspective will determine the individual’s psychological and physical well-being.

**Conclusion**

Pain-invalidation as a construct has yet to be substantively defined. This study involved a search and analysis of pain narratives of patient samples from a variety of populations, across a broad range of pain conditions, producing key themes characterising pain-invalidation. A more thorough understanding of pain-invalidation, however, may be determined by future studies designed explicitly to sample a balance of cultures, and identify any new issues. This analysis has also highlighted the complexity of issues surrounding ongoing pain, and frames *having pain* as a ‘perspective’ that may not be easily comprehended by others in society who do not experience the nuances of various pain conditions, together with the associated fatigue, isolation, threats to moral integrity, loss of identity and role, and resultant guilt, anxiety, frustration, and depression. Failures of the self or the social network to acknowledge the individual’s pain may produce barriers to seeking and adhering to pain management programs. As such, it may be important to identify pain-invalidation in its various forms, with the information used to implement the behavioural components or lifestyle changes involved in pain management and rehabilitation programs.

**Disclosure statement**

The authors report no conflicts of interest.
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50. Maly MR, Krupa T. Personal experience of living with knee osteoarthritis.


Appendix

Search strategy

Medline database search: March, 2019

1. chronic pain
2. persistent pain
3. ongoing pain
4. ongoing pain
5. long term pain
6. 1 or 2 or 3 or 4 or 5
7. invalidat*
8. delegitimat* or delegitimiz* or delegitimatis*
9. delegitimiz* or delegitimis*
10. stigma or stigmatis* or stigmatiz*
11. shame
12. guilt
13. 7 or 8 or 9 or 10 or 11 or 12
14. social support or family support or peer support
15. kinesiophobia
16. sick role
17. pain behavior or pain behaviour or illness behavior or illness behaviour
18. pain catastrophi*ing or pain catastrophi*ation
19. pain coping
20. self-efficacy or self efficacy
21. disability or functional capacity
22. 14 or 15 or 16 or 17 or 18 or 19 or 20 or 21
23. 13 or 22
24. narrative or narratives
25. qualitative
26. 24 or 25
27. 6 and 23 and 26
28. exclude child, and exclude adolescent, and exclude age over 80 years
29. journal articles only
30. include only articles published in English
Additional Notes on Thematic Analysis

Not yet coined in the literature as an academic construct, pain-validation, invalidation and over-validation are rarely cast using such terms. Thus, search terms for relevant articles, shown in the Appendix of the published article, were inclusive of concepts even broadly related to pain-validation. Articles retrieved from the search were pre-screened in Endnote, where duplicates and other unsuitable papers were eliminated from examination, as per the criteria outlined in Table 1 of the published article, with 431 articles remaining for analysis. Articles were then put into the software program NVivo, in groups categorized by the database in which they were found. Moving through each database group, NVivo was used to code approximately 60 articles before reaching saturation of the major themes. The coding process was continued on in further articles, however only for new or ‘unsaturated’ themes. Coding was performed only on the quoted narratives of pain sufferers, not on the author perspectives in the analyzed articles.
CHAPTER 4

Study 2: Development of a Pain-Validation Scale

Given the potential for psychological detriment and functional limitation associated with under- or over-validating pain, as described in Chapters 2 and 3, a primary aim of this research was to develop a scale with the capacity to measure pain-validation levels in several domains (in reference to the Self, Close Others, Healthcare Professionals, and Over-validation). The thematic analysis undertaken in Study 1 (Chapter 3) examined pain narratives, revealing a range of pain-validation themes. These themes depict the primary domains of pain-validation, from which a pool of items can be generated in order to measure the construct. The present chapter describes the first stage of scale development: creating and refining the item pool, conducting a pilot survey of items, and analyzing the results to reduce the item list to those which best measure the construct.

Appropriate use of the terms ‘factor’ and ‘exploratory factor analysis’ (EFA) often create confusion in statistical literature (Costello & Osborne, 2005), and will thus be defined here (however, the details of the data extraction methods will be discussed later in the chapter). EFA is frequently used to refer broadly to exploratory analyses that involve data extraction, most often by either principal components analysis (PCA) or by common factors (CF) analysis. Many authors, however, use the term EFA in direct reference to CF methods, employing a meaning of the term that excludes PCA. This may be due to a number of authors contending that PCA is not a true form of factor analysis (Costello & Osborne, 2005; Fabrigar, Wegener, MacCallum, & Strahan, 1999), and thus, many
constrain their use of the terms ‘factor’ and ‘component’ to CF and PCA methods, respectively (Floyd & Widaman, 1995; Velicer & Jackson, 1990; Widaman 1990). For the purposes of this research, the meaning of the term EFA will encompass the main methods of data extraction as applied in general discussion, and the terms ‘PCA’ and ‘CF’ will be used to distinguish them differentially. For consistency, the term ‘factor’ will be applied to either method, when referring to the constituent ‘groupings’ generated from data analysis.

Developing the Item Pool

Content validity. In developing a sound psychometric measure, a key requirement is the initial generation of items must be broad enough to capture the theorised dimensions of the test construct, with the final set of items, after analysis and item elimination, sufficiently representing the construct (Clark & Watson, 1995; Fabrigar et al., 1999). A pool of items for the Pain-Validation Scale was created drawing from findings of the thematic analysis (Study 1), together with a review of the literature on validation in therapeutic contexts, and an examination of items in scales measuring related constructs. Though some occurrences of over-validation were coded in the thematic analysis performed in Study 1, the majority of items designed to measure over-validation were constructed through a review of literature related to pain-catastrophization and fear avoidance (Smith, Herman, & Smith, 2015; Sullivan, et al., 2001; Turner, Mancl, & Aaron, 2004; Vlaeyen & Linton, 2000), pain behaviours (Raichle, Romano, & Jensen, 2011), and disability related to pain-interference by significant others (Leonard, Cano, & Johansen, 2006; Newton-John, 2013; Romano et al., 1995). Content validity can also be enhanced by issuing the scale
items to a panel of subject matter experts for feedback and discussion about each item’s representativeness of the construct (Springer, Abell, & Hudson, 2002), a procedure followed accordingly in this research, to be discussed later in the chapter.

In order to cover the full scope of the construct it is recommended that the original pool of items be considerably larger than the final item list comprising the new scale (Loevinger, 1957, Springer et al., 2002). Given that analysis of internal consistency had not yet occurred in this preliminary stage, DeVellis (2017) notes the benefit in providing a surplus of items, in that the researcher has more scope for selection in the later process of discerning items of best fit. Thus, an initial set of 128 items (shown in Appendix B) was generated to reflect the themes emerging from pain literature, based on a priori assumptions of potential subscales: Pain-Validation by the Self, Pain-Validation by Significant Others, Pain-Validation by Healthcare Professionals, Over-validation, Self-expectations, and Social Others’ Expectations. Notably, it is possible that an individual’s pain may be validated while their claims of functional limitation are disbelieved. For many, functional impairment is a direct outcome of the pain itself. Thus it was relevant that the original pool of items included those pertaining to (in)validation and over-validation of the patient’s pain, and items more directly concerning functional impairment.

While the validity of items is an imperative feature of a sound psychometric instrument, the quality of the data can be greatly undermined by a confused, unmotivated, or fatigued respondent (Krosnick & Presser, 2010). Therefore, researchers must at all times be mindful of the cognitive load borne by the
respondent, and the numerous mental processes involved in the seemingly simple task of survey-taking. Podsakoff, MacKenzie, Lee, and Podsakoff (2003) propose that respondents move through five stages of processing in answering survey items: (i) comprehension of the question / statement, (ii) mental retrieval of information, (iii) formulating a judgement, (iv) mapping their judgement on to the most suitable response option, (v) recording a response. Difficulties at any of these stages of processing further tax the respondent cognitively, increasing fatigue and / or decreasing motivation to dedicate the effort required to supply high quality responses, with a likely reduction in the quality of data produced (Krosnick, 1991; Krosnick & Presser, 2010).

**Item wording.** Attention must be paid to the wording of instructions and items, with clarity being key among the recommendations (DeVellis, 2017; Krosnick & Presser, 2010). In the present study, items were constructed with respect to a range of recommendations including: keeping items concise (Hinkin, 1998; Krosnick & Presser, 2010), use of simple language that is suitable for the education level of the target audience (readability), free of technical jargon or colloquialisms (Clarke & Watson, 1995; Shum, O’Gorman, Myors, & Creed, 2013), and avoiding ambiguity of meaning in an effort to ensure that any given item will be interpreted the same way by every survey participant (Hardy & Ford, 2014; Podsakoff et al., 2003). Another important criterion was avoidance of double-barrelled items, essentially asking the respondent to address multiple statements in responding to a single item (Clark & Watson, 1995), for example, “I feel frustrated and hopeless when I can’t perform my usual daily tasks.” It is possible to feel frustrated without feeling hopeless, and yet, as a single item, the respondent would be required to equally endorse feeling both ‘frustrated’ and
‘hopeless’. In this way, double-barrelled statements have poor validity as a pure measure of the construct.

An additional consideration in test design is the inclusion of both positively and negatively worded items. Statements that indicate higher respondent levels of the test construct (such as pain-validation) when endorsed highly are said to be positively worded (DeVellis, 2017), for example, “My partner is sympathetic when I express pain.” Conversely, statements that indicate lower levels of the test construct when endorsed highly are said to be negatively worded (DeVellis, 2017), for example, “My partner shows irritation when I express pain.” There are arguments for and against the inclusion of both positively and negatively worded items in a scale. The proposed benefit in using oppositely worded items is to eliminate acquiescence (or agreement) bias, whereby respondents tend to agree with statements without paying true attention to the item content (Barnette, 2000). The inclusion of both positively and negatively worded items should highlight any merely acquiescent responses – where high endorsement occurs continuously throughout the items, regardless of whether the item is positively worded (in favour of the test construct), or negatively worded (anti-construct) (DeVellis, 2017).

In reality, however, oppositely worded items may cause confusion, with the respondent having to consider the content of the new item, mentally adjust the valence, and determine their level of endorsement (in the reversed direction) on the response scale (DeVellis, 2017). Although many respondents can manage the mental manipulation required in responding to oppositely worded items, some respondents perform poorly, thus interfering with item correlations, and
potentially reducing the item’s statistical reliability (DeVellis, 2017; Gu, Wen, & Fan, 2017). In addition, concerns have been raised that oppositely worded items may actually be measuring different constructs (Chyung, Barkin, & Shamsy, 2018; Marsh, 1996), or possibly introducing a source of method effects (Gu et al., 2017). However, in the current study, both positively and negatively worded items were included in the initial phase of instrument design. It was reasoned that the stage of exploratory analysis offers an opportunity to evaluate how all potential items perform, and would allow for the elimination of items deemed to be problematic, at a later stage.

Response scale. As in item wording, there are numerous considerations when determining the most suitable response options for the development of a new scale. A popular choice in self-report measures is a response scale introduced by Rensis Likert (1932), used extensively in the social sciences, particularly for attitudinal measures (Liao, 2014). The Likert scale offers distinct, ordinal answer categories, and is used widely in computer-based surveys (Kuhlmann, Dantlgraber, & Reips, 2017). In addition, Likert scales are well-suited to the statement – answer battery format of psychometric instruments intended to measure an individual’s status on a particular construct (Chyung et al., 2018). The present study, intended to measure an individual’s level of pain-validation, was designed such that the principal mode of access to the survey would be via the internet. Given that an internet test delivery prohibits the opportunity for respondents to clarify their meanings with the researcher, the need for instructions, items, and response options to be clear was crucial. Thus, in consideration of the test purpose and platform, the Likert response scale was deemed ideal for use in the current study.
There are numerous features to consider in the design of a response scale, including: anchor points, number of response categories, how categories should be labelled, and whether to include a midpoint. Once again, the researcher must appreciate the test-taker’s perspective, balancing the advantages and disadvantages of each decision. A good example is the debate over more versus fewer response categories, with research typically suggesting an optimal number of categories on rating scales ranging between 5 and 10 (Alwin & Krosnick, 1991; Chen, Yu, & Yu, 2015; DeCastellarnau, 2018; Krosnick & Presser, 2010). While it has been argued that more response options allow for greater variability and, thus, capacity for discrimination between respondents (Alwin, 1997; Garner, 1960; Springer et al., 2002), problems can arise for respondents trying to make fine distinctions when selecting between too many scale points – potentially interfering with scale reliability (Clark & Watson, 1995; Krosnick & Presser, 2010). In the current study, a 7-point scale was selected for the Pain-Validation Scale, to provide enough variability to optimize the scale’s discriminability and capacity to detect change in individuals (who undergo re-test) over time, while still limiting any unnecessary cognitive load on respondents.

In further attempts to reduce cognitive load and ambiguity, it was decided that each scale point would be labelled both in writing and with a corresponding number value, since it has been shown that more thoroughly labelled response scales produce more reliable outcomes (Alwin & Krosnick 1991). As such, scale points were labelled from left to right as 1 = ‘Strongly Disagree’, 2 = ‘Disagree’, 3 = ‘Slightly Disagree’, 4 = ‘Neither Agree Nor Disagree’, 5 = ‘Slightly Agree’, 6 = ‘Agree’, and 7 = ‘Strongly Agree’. Anchor points of 1 through 7 were chosen with a neutral midpoint of 4. Again, researchers debate the benefit or detriment of
including a midpoint, with some suggesting that a midpoint detracts from data quality, offering an easy option for those with low motivation or weak attitudes toward a given item (Krosnick & Presser, 2010). The alternative argument is that forcing respondents with genuinely neutral views to choose one side or the other may thwart the researcher’s goal to achieve honest answers and true measurement (Springer et al., 2002). In the present study, a midpoint for the response scale was included to preserve the capacity for valid measurement of a true neutral, in an effort to foster a favourable attitude toward the task (motivation), rather than force a reluctant response in either direction.

**Expert Review**

Once the item pool has been generated, it is advisable to have the items reviewed by experts in the topic area or, indeed, experts in scale development (Krosnick & Presser, 2010). Subject matter experts (SMEs) can provide feedback on the construct relevance of items, and offer opinions about areas of the construct that may have been missed, thereby improving content validity (DeVellis, 2017; Gehlbach & Brinkworth, 2011). Ideally, SMEs will know something of the target audience, and may offer feedback related to item suitability, and possible alternative interpretations by prospective respondents.

Nine potential SMEs were approached for feedback on the item pool, with six agreeing to complete the task, including: a specialist pain doctor, a nursing academic with scale development expertise, a chiropractic academic, a practicing chiropractor, and two practicing physiotherapists. An introduction to the research, the initial list of items, and task instructions that were emailed to the SMEs for completion, are shown in Appendix B. The feedback task invited SMEs to
consider the items with regard to their relevance to clients with pain, potential issues with readability or ambiguity of interpretation, and adequacy in representing the construct of pain-validation. Comments on any individual item were invited, and a section welcoming general feedback was included on the final page of the task.

Among the comments were suggestions to change instances of double negatives. Rather than use double negatives to try to frame a question positively (to promote happier sentiment), for example “I do not think less of myself for having a pain condition”, it was determined that more direct wording such as, “I think less of myself for having a pain condition”, would be less cognitively demanding and, thus, ultimately preferable. Suggestions for change were also offered on items that appeared too wordy, or seemed too similar to another item.

Other feedback advised the need to clarify reference groups in items using general terms such as ‘people’ or ‘others’, for example, “People don’t seem to believe that I have pain because I look well.” Similar comments were made for items in the section ‘Pain-Validation by Healthcare Professionals’. For example, with regard to the item, “My doctor helps me plan ways to stay as active as possible”, it was tendered that many individuals primarily seek the help of healthcare professionals other than their doctor. Given that a scale’s reliability depends greatly on clarity such that all respondents understand the items in the same way (Hardy & Ford, 2014), the decision was made to provide a preamble prior to items in certain sections, to define reference groups. The section regarding healthcare professionals is one example where this change was applied, with the inclusion of a preamble: “The phrase 'my healthcare professional' in this section refers to the main healthcare professional who is managing your pain
condition. For example, this may be a GP, a specialist doctor, or a physiotherapist…” Following SME feedback, for the purposes of item brevity, simplicity, and to prevent repetition, the item stem “My healthcare professional...” was inserted prior to the item list for the relevant section. To exemplify, a complete item would be read as, “My healthcare professional seems to think that my pain is my own fault.”

An important change that was implemented following expert recommendations was the removal of the Expectation Stress subscales, ‘Self-Expectations’ and ‘Social Others’ Expectations’. It was posited that these items seemed to be applicable to the population more generally than just people with chronic pain, and may not be limited to measuring pain-validation but may capture a separate or additional construct. Thus, the 39 expectation stress items were removed, leaving 4 pain-validation subscales relating to Self, Close Others, Healthcare Professionals, and Over-validation items.

**Pilot Feedback**

Following expert review and the resulting amendments and deletions, a pool of 82 items remained for distribution to a pilot group of 10 local community members. For the specific purposes of this stage it was not necessary that those providing feedback had chronic pain, but that they were adults in the representative age range (18-65 years), with an even ratio of males to females. The pilot group members were asked to review the items in the form of an online feedback task (Appendix C), accessed by clicking on a Universal Resource Locator (URL) link supplied by the researcher. The task offered information about pain-validation and the nature of the study, followed by a request to review
the proposed instructions to potential test-takers, together with the 7-point Likert
response scale, and the items. Each page presented approximately 8 items,
followed by the prompt: “Do you have any comments or recommendations
regarding any of the survey questions above? e.g. readability of questions (do
they make sense?), possible ambiguity or misinterpretations, suitability of the 7-
point response scale provided, general item relevance, or other comments...”. The final page of the task also provided a further opportunity for pilot respondents
to offer general comments or recommendations about the survey.

Several respondents noted that the phrase ‘close others’ read awkwardly and
should be revised. Thus, the wording was changed to ‘immediate others’ and a
preamble was included to better define the reference group: “The phrase
‘immediate others’ in this section refers to those people with whom you spend the
most time, such as your partner, housemate, or other people you live with.” In
the interest of item brevity, simplicity, and to prevent repetition, stems were also
inserted prior to the item list for each section other than the first (‘Pain-validation
by the Self’ – for which the item wording did not lend itself to use of an item
stem). Stems used prior to item lists were either “Immediate others…” or “My
healthcare professional...” To exemplify, a complete item would be read as
“Immediate others seem to think that I am exaggerating my pain symptoms.”

The issue of affect was also a minor theme in the feedback, with some
suggesting that more positively framed items could be added. With respect to this
concern, the items “I think less of myself for having a pain condition” and “I see
my pain as a personal failing” were removed as they added unnecessarily to an
already negatively weighted list, without enough compensatory value.
Redundancy of certain item pairs were also noted on occasion, due to the fact that some similarly worded items (with subtly different meanings) were used to provide an adequate selection to enable determination of best fit (Devellis, 2017). Accordingly, the item “I would like close others to let me do more for myself” was removed due to its similarity to “Even though I have pain, I would like close others to let me do more things on my own”. Finally, the research team implemented the suggestion to include a comment section for survey respondents to offer their own insight and perspective that could not be expressed elsewhere.

**Survey Distribution**

**Method**

*Design.* The pain-validation scale was administered as part of a survey designed using Qualtrics software, which allowed for private distribution of the survey via URL, and links to online survey distribution services. The study was also designed so that participants could remain anonymous, thereby encouraging honest responses (Bradburn, Sudman, & Wansink, 2004). The crowdsourcing platform, Prolific Academic (also known as ‘Prolific’), was chosen as the primary means of participant recruitment for the project. Prolific provides a participant pool numbering greater than 60,000 individuals, who register with the service by providing basic information, with the opportunity to answer more specialized questions in order to affirm their eligibility to participate in a range of applicable studies (Palan & Schitter, 2018). Participants sourced through Prolific are paid a set fee, based on a minimum rate (which was £5 per hour at the time of data collection for the present study).

Advantages of using Prolific over other crowdsourcing platforms such as
MTurk, have been reported, including greater participant naivety – hence reduced potential for practice effects, and greater population diversity (Palan & Schitter, 2018; Peer, Brandimarte, Samat, & Acquisti, 2017). Indeed, greater cultural diversity is also an advantage of using online crowdsourcing generally, compared to the direct recruitment of local participants. However, concerns have been raised against the recruitment of participants through crowdsourcing, in that the set incentive payment which may seem minimal across much of society, may represent excessive enticement in underprivileged countries (Palan & Schitter, 2018). Prolific, however, allows participation exclusively to individuals living in member countries of the Organisation for Economic Cooperation and Development, also known as OECD countries (Palan & Schitter, 2018). Thus, for the anticipated demographics of the sample population, the actual payment amount of £1.70 per participant (for an estimated 20-minute survey) was regarded by the research team as appropriate and non-excessive.

The survey was able to identify any missed responses using the ‘force response’ design option offered in Qualtrics software. Thus, beyond the demographic questions, when participants attempted to proceed to the next page without completing all present items, an automatic message appeared prompting them to first answer all items on the current page. As a result, item responses were recorded with no missing data.

**Participants.** Certain selection criteria were applied in recruiting participants. Firstly, since the study aimed to develop a measure of pain-validation levels experienced by those with chronic pain, a parameter was applied allowing participation only by individuals with a pain condition lasting three
months or longer. Secondly, the scale was designed for use on the adult population and thus, a minimum age parameter of 18 years was applied. The upper age limit for participation was set at 65 years as it was reasoned that, given the higher prevalence of painful, degenerative conditions experienced by older individuals (Jayabalan & Sowa, 2014; McGeer & McGeer, 2004), society would be more believing and accepting of their pain (making the issue of pain-invalidation less applicable to the demographic). A third criterion for selection was that the participant’s pain was not due to a cancerous condition. Again, it was considered that society would be more believing, accepting, and supportive of cancer-related pain, since many cancerous conditions are known to be associated with pain (Cousins & Gallagher, 2011). The final exclusion criterion was participants with pain due to broken / still-healing tissue due to recent injury or surgery.

**Procedure.** Survey data for exploratory factor analysis (EFA) was collected in May 2018. At the time of survey release, Prolific had 10,822 registered members who were eligible to participate according to the pre-screening criteria for this study. A brief paragraph advertising the study was available in Prolific for prospective participants to view before deciding to take part. Interested individuals could select the study in Prolific which linked participants to the EFA survey (Appendix D) housed on the Qualtrics survey platform. Participants were presented with more detailed information about the study, and could indicate consent to participate by answering ‘Yes’ to the online consent question, or could choose to answer ‘No’ to discontinue the survey. Some basic demographic questions were then presented, followed by the pain-validation survey instructions and items. Participant demographics are shown in Table 4.1.
Table 4.1. Demographics of participants in the EFA survey.

<table>
<thead>
<tr>
<th>Participant Demographics</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sample size</strong></td>
</tr>
<tr>
<td><strong>Age</strong></td>
</tr>
<tr>
<td><strong>Gender</strong></td>
</tr>
<tr>
<td><strong>Nationality</strong></td>
</tr>
<tr>
<td><strong>Pain Condition</strong></td>
</tr>
</tbody>
</table>
Responses were obtained online from 307 individuals. Two responses were excluded, demonstrating content non-responsivity, or inattentive responses (Meade & Craig, 2012). Two further responses were removed, coming from individuals who specified having cancer in answer to the question about the nature of their pain condition. A fifth participant failed to meet the criterion of ‘chronic’ pain, indicating pain for less than 3 months; thus, their response was excluded from analyses. The sample size remaining for exploratory analysis was 302 responses. Guidelines for ideal sample size vary widely within psychometric statistics literature, with researchers employing response-to-item ratios ranging from 2:1 up to 20:1 (Costello & Osborn, 2005). Some literature promotes that sample size may be adequate providing that factors have been overdetermined (represented by 3 or more items), and that high enough item communality exists (Fabrigar et al., 1999). However, the recommendation for a sample size of at least \( n = 300 \) (Clark & Watson, 1995; MacCallum, Widaman, Zhang, & Hong, 1999) is a widely accepted benchmark for factor analysis.

**Exploratory Factor Analysis**

Researchers often begin with a theoretical conceptualization when determining and classifying the dimensions of a construct domain. Factor analysis can then be used as a statistical and quantifiable means of construct identification (Fabrigar & Wegener, 2011). Exploratory analyses involve decisions regarding the selection of an extraction method, a rotation method, the number of factors, and item reduction. Researchers should thus begin with a clear understanding about the purpose of the analysis, and the advantages and disadvantages of each methodological option.
The topic of extraction methods fuels heavily debated discussion regarding the use of CF versus PCA (Costello & Osborne, 2005). PCA is one of the most popular extraction methods (de Winter & Dodou, 2016; Howard, 2016), valued for its ability to reduce a large number of variables into parsimonious components that account for the greatest degree of variance (Conway & Huffcutt, 2003). A frequently raised concern, however, is that PCA does not account for the distinct types of variance: (i) common variance – shared between variables, and (ii) unique variance – unique to the variable itself and/or possibly due to random error (Floyd & Widaman, 1995). The computational method of CF analysis unveils potential latent variables that may cause covariance of the manifest variables (Fabrigar et al., 1999), though the approach also has its own limitations (Brown, 2015; Velicer & Jackson, 1990). Indeed, DeVellis (2017) notes that CF analyses break the data into hypothetical variables with the data only estimating idealised causal constructs while, in contrast, PCA generates factors directly from the weighted sums of the actual item scores. In essence, CF offers a hypothetical causal solution, while PCA solutions are a product of the scores obtained, arranged in linear groupings (DeVellis, 2017).

Researchers also debate the quality of data outcomes through PCA versus CF, with some literature suggesting that PCA produces inflated loadings (Widaman, 1990), while other studies defend the use of PCA, reporting no substantial differences between the two methods except in cases with a small number of variables, or in the presence of low communalities (de Winter & Dodou, 2016; Velicer & Jackson, 1990). However, it seems reasonable to assume that low communalities for scale items indicate a poor relationship with other items, or that additional factors may be present (Costello & Osborne, 2005); and
either way, elimination of the poor fit item or a re-examination of the data is warranted. Given the large number of variables (79) examined in the current study, and the sample size, the utility of PCA extraction for data reduction was preferred at this stage of scale development.

The Statistical Package for Social Sciences (SPSS) software, version 24, was used to perform PCA, initially on all 79 items, using direct oblimin rotation. The decision to use oblique rotation was based on the assumption that factors would correlate to some degree (Costello & Osborne, 2005). An extraction of factors with Eigenvalues greater than 1 (Floyd & Widaman, 1995) produced 15 components. However, Eigenvalues of the first 4 factors were greater than 5, and decreased markedly in the subsequent factors, as shown in Table 4.2. Support for the *a priori* prediction of 4 subscales was shown in the scree plot, Figure 4.1, which indicated a similar number of potential factors.
Table 4.2. Eigenvalues and variance explained by factors extracted in principal component analysis of 79 pain-validation items.

<table>
<thead>
<tr>
<th>Component</th>
<th>Total</th>
<th>% of Variance</th>
<th>Cumulative %</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>18.49</td>
<td>23.40</td>
<td>23.40</td>
</tr>
<tr>
<td>2</td>
<td>6.87</td>
<td>8.69</td>
<td>32.1</td>
</tr>
<tr>
<td>3</td>
<td>6.10</td>
<td>7.72</td>
<td>39.82</td>
</tr>
<tr>
<td>4</td>
<td>5.39</td>
<td>6.82</td>
<td>46.64</td>
</tr>
<tr>
<td>5</td>
<td>2.64</td>
<td>3.34</td>
<td>49.98</td>
</tr>
<tr>
<td>6</td>
<td>2.20</td>
<td>2.78</td>
<td>52.76</td>
</tr>
<tr>
<td>7</td>
<td>1.94</td>
<td>2.46</td>
<td>55.22</td>
</tr>
<tr>
<td>8</td>
<td>1.84</td>
<td>2.33</td>
<td>57.56</td>
</tr>
<tr>
<td>9</td>
<td>1.59</td>
<td>2.01</td>
<td>59.56</td>
</tr>
<tr>
<td>10</td>
<td>1.45</td>
<td>1.84</td>
<td>61.40</td>
</tr>
<tr>
<td>11</td>
<td>1.36</td>
<td>1.72</td>
<td>63.12</td>
</tr>
<tr>
<td>12</td>
<td>1.26</td>
<td>1.59</td>
<td>64.72</td>
</tr>
<tr>
<td>13</td>
<td>1.15</td>
<td>1.46</td>
<td>66.17</td>
</tr>
<tr>
<td>14</td>
<td>1.09</td>
<td>1.38</td>
<td>67.56</td>
</tr>
<tr>
<td>15</td>
<td>1.04</td>
<td>1.32</td>
<td>68.87</td>
</tr>
<tr>
<td>16</td>
<td>0.98</td>
<td>1.24</td>
<td>70.11</td>
</tr>
</tbody>
</table>

*Note.* Only the first 16 factors are shown in the table.
Extractions of 5, and then 4 forced factors were thus performed, with most items loading as expected on the 4 predicted factors of ‘Invalidation by the Self’, ‘Invalidation by Immediate Others’, ‘Invalidation by Healthcare Professionals’, and ‘Over-validation’. The few items on the 5th factor typically demonstrated poor fit, either cross-loading with other factors, and / or loading weakly, and as a group were not representative of any obvious, single construct theme. Thus, a 4-factor structure was accepted, and item analysis was thereafter performed on each subscale, separately.

Figure 4.1. Scree plot of Eigenvalues of 79 pain-validation items.
As a measure of sampling adequacy, the Kaiser-Meyer-Olkin (KMO) statistic obtained for the total pool of variables was .901, indicating strong support for suitability of the sample’s size for factor analysis, given the guidelines of .60 as a minimum KMO value for suitability (Allen & Bennett, 2012; Worthington & Whittaker, 2006). The anti-image matrix showed that the KMO statistic was also well within an acceptable range (Field, 2013) for all variables individually, being above 0.7 for all but 4 items, which fell within the (still acceptable) range of 0.6 – 0.7. Bartlett’s test of sphericity offers another gauge as to whether the variables show any degree of correlation (such that PCA may be appropriate). Bartlett’s test was significant, $p < .001$, allowing for rejection of the null hypothesis that the variables resemble an identity matrix with negligible correlation between variables (Field, 2013). The component correlation matrix, shown in Table 4.3, revealed low to moderate correlations between each of the 4 factors, thereby validating the use of oblique rotation.

Again, no definitive rules exist regarding factor loading cut-offs, however, Stevens (2002) bases recommendations for loading cut-offs on sample size, while other researchers note that a factor with only a few items may need a loading of at least .50 to offer sufficient stability (Costello & Osborne, 2005). A commonly observed recommendation is to, in the first instance, retain items loading with a coefficient of least .30 (Field, 2013). In the present study analysis was, therefore, limited to items loading with a coefficient of $>.30$.

**Item Reduction**

Decisions related to item reduction were based on a range of characteristics, including item performance descriptives (means, standard deviations, and
Table 4.3. Correlation matrix of pain-validation components using 4 forced factors.

<table>
<thead>
<tr>
<th></th>
<th>Invalidation by Self</th>
<th>Invalidation by Imm. Others</th>
<th>Invalidation by HCP</th>
<th>Over-validation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Others</td>
<td>.28**</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HCP</td>
<td>-.25**</td>
<td>-.38**</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Over</td>
<td>.14*</td>
<td>.08</td>
<td>-.07</td>
<td>-</td>
</tr>
</tbody>
</table>

Note. **Correlation is significant at the .01 level. *Correlation is significant at the .05 level. N = 302.

skewness shown in Table 4.4), inter-item correlations, factor loading coefficients, cross-loading, and internal consistency of the subscale. A major goal of this stage of analysis was to reduce the pool of potential items down to those best representing the subscales, and the overall pain-validation construct. In estimating the approximate, eventual number of scale items, it was important to consider the fatigue and concentration difficulties often experienced by individuals with chronic pain (Glass et al., 2011; Grace, Nielson, Hopkins, & Berg, 1999; Sturgeon, Darnall, Kao, & Mackey, 2015), in order to achieve the optimal balance between sufficient construct representation and overloading the respondent with too many items. Thus, the target was that the eventual scale would contain no more than 7 items in each of the 4 subscales. Though the process of item reduction is highly iterative (Worthington & Whittaker, 2006), and final decisions are based on assessment of many elements, a general goal of reduction to approximately 9 items per subscale was established for this stage of analysis (allowing for future fine tuning of best fit items).
**Inter-item correlations.** The inter-item correlation matrix for all 79 items was examined for indications of potential item redundancy. Five item pairs were found to correlate at $>\pm 0.79$. Those pairs included IO.1 and IO.2 ($r = .81$); IO.16 and IO.19 ($r = .82$); IO.18 and IO.19 ($r = .80$); HP.6 and HP.7 ($r = .80$); HP.11 and HP.12 ($r = .81$). No negative inter-item correlations stronger than -0.64 were found. Of the item pair IO.1 versus IO.2 (Table 4.4), item IO.2 was retained because it loaded more strongly on the factor and appeared to be worded more simply and clearly than item IO.1. The same reasoning was applied in the decision to retain item HP.12 out of the item-pair HP.11 versus HP.12 (Table 4.4). Both items IO.16 “Immediate others make me feel guilty for having pain” and IO.19 “Immediate others seem to judge me negatively for having pain” loaded very similarly. However, item IO.16 was preferable because the phrase “make me feel guilty” seemed more specific, compared to the more vaguely worded phrase “judge me negatively”. The decision to retain item HP.7 out of the item-pair HP.6 versus HP.7 (Table 4.4) was also based on wording clarity.

**Item performance characteristics.** Item means, standard deviations (SD), and skewness were assessed to help identify items appearing to have low discriminatory value. For example, item S.12 “Having pain is a sign of poor character” had the lowest mean (2.27), coupled with one of the lowest SDs (1.48), and highest skew (1.19), indicating that most people endorsed the low (‘Disagree’) end of the response scale, without enough deviation in people’s responses for the item to effectively discriminate levels of pain-validation. Thus, item S.12, together with items S.2, IO.9, and HP.1 (Table 4.4) were similarly eliminated early for poor discriminatory value.
Chapter 4: Scale Development

Table 4.4. Descriptive statistics for items of each pain-validation subscale.

<table>
<thead>
<tr>
<th>Subscale items: Invalidation by the Self</th>
<th>Mean</th>
<th>SD</th>
<th>Skew</th>
</tr>
</thead>
<tbody>
<tr>
<td>S.1_ I am caring toward myself when I have pain.</td>
<td>4.71</td>
<td>1.57</td>
<td>-0.52</td>
</tr>
<tr>
<td>S.2_ I get impatient with myself about my pain condition.</td>
<td>5.32</td>
<td>1.44</td>
<td>-0.88</td>
</tr>
<tr>
<td>S.3_ I allow myself to feel pain without being self-critical.</td>
<td>4.33</td>
<td>1.50</td>
<td>-0.27</td>
</tr>
<tr>
<td>S.5_ I feel guilty talking about my pain condition.</td>
<td>4.23</td>
<td>1.83</td>
<td>-0.26</td>
</tr>
<tr>
<td>S.6_ I tend to ignore pain or illness symptoms and keep pushing through my day.</td>
<td>5.19</td>
<td>1.52</td>
<td>-0.81</td>
</tr>
<tr>
<td>S.7_ I should have found a way to get rid of my pain by now.</td>
<td>4.97</td>
<td>1.64</td>
<td>-0.59</td>
</tr>
<tr>
<td>S.9_ My pain condition makes me feel abnormal.</td>
<td>4.37</td>
<td>1.84</td>
<td>-0.35</td>
</tr>
<tr>
<td>S.10_ Having pain is a sign of weakness.</td>
<td>3.26</td>
<td>1.84</td>
<td>0.37</td>
</tr>
<tr>
<td>S.11_ I am ashamed of having a pain condition.</td>
<td>3.39</td>
<td>1.96</td>
<td>0.43</td>
</tr>
<tr>
<td>S.12_ Having pain is a sign of poor character.</td>
<td>2.27</td>
<td>1.48</td>
<td>1.19</td>
</tr>
<tr>
<td>S.13_ I don’t feel right talking about my pain because I know some other people have it worse than me.</td>
<td>4.61</td>
<td>1.81</td>
<td>-0.45</td>
</tr>
<tr>
<td>S.14_ I don’t talk about my pain because I don’t want to be a ‘whinger’.</td>
<td>4.76</td>
<td>1.69</td>
<td>-0.64</td>
</tr>
<tr>
<td>S.15_ I get angry at myself for having pain.</td>
<td>4.12</td>
<td>1.82</td>
<td>-0.28</td>
</tr>
<tr>
<td>S.16_ I feel like I am letting my partner and/or close family members down because my pain limits me.</td>
<td>4.29</td>
<td>1.93</td>
<td>-0.29</td>
</tr>
<tr>
<td>S.17_ I don’t feel like I am contributing enough at home, because of my pain.</td>
<td>4.05</td>
<td>1.95</td>
<td>-0.16</td>
</tr>
<tr>
<td>S.18_ I try to hide my pain because I don’t want everyone else to know.</td>
<td>4.85</td>
<td>1.54</td>
<td>-0.63</td>
</tr>
<tr>
<td>S.19_ I sometimes wonder if my pain is ‘all in my head’.</td>
<td>3.35</td>
<td>2.00</td>
<td>0.32</td>
</tr>
<tr>
<td>S.20_ Having a pain condition makes me feel embarrassed.</td>
<td>3.67</td>
<td>1.84</td>
<td>0.05</td>
</tr>
<tr>
<td>S.21_ Sometimes my pain makes me feel useless.</td>
<td>4.97</td>
<td>1.76</td>
<td>-0.82</td>
</tr>
<tr>
<td>S.22_ Having a pain condition makes me feel undesirable.</td>
<td>4.24</td>
<td>1.86</td>
<td>-0.21</td>
</tr>
<tr>
<td>S.23_ I feel like a burden to others because of my pain condition.</td>
<td>4.28</td>
<td>1.83</td>
<td>-0.34</td>
</tr>
</tbody>
</table>
### Subscale items: Invalidation by Immediate Others

<table>
<thead>
<tr>
<th>Subscale</th>
<th>Description</th>
<th>Mean</th>
<th>S.D.</th>
<th>Skew</th>
</tr>
</thead>
<tbody>
<tr>
<td>IO.1_</td>
<td>Immediate others are very supportive of me in my pain condition.</td>
<td>5.22</td>
<td>1.49</td>
<td>-0.86</td>
</tr>
<tr>
<td>IO.2_</td>
<td>Immediate others are generally sympathetic about my pain.</td>
<td>5.13</td>
<td>1.47</td>
<td>-0.86</td>
</tr>
<tr>
<td>IO.3_</td>
<td>Immediate others don’t seem to believe that I have pain because I look well.</td>
<td>3.17</td>
<td>1.76</td>
<td>0.41</td>
</tr>
<tr>
<td>IO.4_</td>
<td>Immediate others seem to get annoyed with me about my pain condition.</td>
<td>3.01</td>
<td>1.60</td>
<td>0.31</td>
</tr>
<tr>
<td>IO.5_</td>
<td>Immediate others who hear about my pain condition seem to think that I am being weak.</td>
<td>2.68</td>
<td>1.54</td>
<td>0.63</td>
</tr>
<tr>
<td>IO.6_</td>
<td>Immediate others tend to be intolerant of my pain condition.</td>
<td>2.89</td>
<td>1.74</td>
<td>0.60</td>
</tr>
<tr>
<td>IO.7_</td>
<td>Immediate others seem to think it is my own fault that I still have pain.</td>
<td>2.76</td>
<td>1.68</td>
<td>0.64</td>
</tr>
<tr>
<td>IO.8_</td>
<td>Immediate others seem disappointed in me because of my pain condition.</td>
<td>2.62</td>
<td>1.54</td>
<td>0.70</td>
</tr>
<tr>
<td>IO.9_</td>
<td>Immediate others don’t really want to hear about my pain.</td>
<td>3.71</td>
<td>1.77</td>
<td>-0.83</td>
</tr>
<tr>
<td>IO.10_</td>
<td>Immediate others don’t really want to hear about my pain.</td>
<td>3.71</td>
<td>1.77</td>
<td>0.07</td>
</tr>
<tr>
<td>IO.11_</td>
<td>Immediate others seem to think that I am exaggerating my pain symptoms.</td>
<td>3.43</td>
<td>1.75</td>
<td>0.18</td>
</tr>
<tr>
<td>IO.12_</td>
<td>Immediate others don’t really want to hear about my pain.</td>
<td>3.71</td>
<td>1.77</td>
<td>0.07</td>
</tr>
<tr>
<td>IO.13_</td>
<td>Immediate others do not seem to realize how hard it is for me to do normal daily activities.</td>
<td>4.11</td>
<td>1.85</td>
<td>-0.16</td>
</tr>
<tr>
<td>IO.14_</td>
<td>Immediate others seem to think that I use my pain condition to be lazy.</td>
<td>3.15</td>
<td>1.83</td>
<td>0.46</td>
</tr>
<tr>
<td>IO.15_</td>
<td>Immediate others say that I need to ‘toughen up’.</td>
<td>2.62</td>
<td>1.69</td>
<td>0.83</td>
</tr>
<tr>
<td>IO.16_</td>
<td>Immediate others make me feel guilty for having pain.</td>
<td>2.80</td>
<td>1.69</td>
<td>0.63</td>
</tr>
<tr>
<td>IO.17_</td>
<td>Immediate others don’t believe that my pain is real because there is no obvious evidence of it.</td>
<td>2.76</td>
<td>1.70</td>
<td>0.68</td>
</tr>
<tr>
<td>IO.18_</td>
<td>Immediate others seem to judge me negatively for having pain.</td>
<td>2.74</td>
<td>1.68</td>
<td>0.64</td>
</tr>
<tr>
<td>IO.19_</td>
<td>People in general think I am faking pain symptoms to get financial benefits.</td>
<td>2.49</td>
<td>1.62</td>
<td>0.99</td>
</tr>
<tr>
<td>IO.20_</td>
<td>People in general seem to think that I use my pain to get attention.</td>
<td>2.90</td>
<td>1.71</td>
<td>0.52</td>
</tr>
<tr>
<td>IO.21_</td>
<td>People in general are surprised at how well I function with my pain condition.</td>
<td>4.31</td>
<td>1.64</td>
<td>-0.38</td>
</tr>
<tr>
<td>IO.22_</td>
<td>In terms of my pain, I feel well supported by people in general.</td>
<td>4.07</td>
<td>1.58</td>
<td>-0.27</td>
</tr>
<tr>
<td>IO.23_</td>
<td>I don’t feel like I can talk about my pain because people in general do not understand my condition.</td>
<td>4.65</td>
<td>1.70</td>
<td>-0.51</td>
</tr>
<tr>
<td>IO.24_</td>
<td>People in general are sick of hearing about my pain.</td>
<td>3.65</td>
<td>1.63</td>
<td>0.11</td>
</tr>
<tr>
<td>IO.25_</td>
<td>I feel like I am being judged negatively by people in general, for taking pain medication.</td>
<td>3.52</td>
<td>1.76</td>
<td>0.15</td>
</tr>
<tr>
<td>IO.26_</td>
<td>In terms of my pain, people in general don’t seem to understand what I am going through.</td>
<td>4.78</td>
<td>1.62</td>
<td>-0.57</td>
</tr>
</tbody>
</table>
## Subscale items: Invalidation by Healthcare Professionals

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Mean</th>
<th>S.D.</th>
<th>Skew</th>
</tr>
</thead>
<tbody>
<tr>
<td>HP.1</td>
<td>listen and tries to understand when I explain about my pain.</td>
<td>5.19</td>
<td>1.50</td>
<td>-0.82</td>
</tr>
<tr>
<td>HP.2</td>
<td>seems to believe that I am doing my best to get rid of my pain.</td>
<td>5.04</td>
<td>1.42</td>
<td>-0.64</td>
</tr>
<tr>
<td>HP.3</td>
<td>seems to think that my pain is my own fault.</td>
<td>2.60</td>
<td>1.56</td>
<td>0.79</td>
</tr>
<tr>
<td>HP.4</td>
<td>has indicated that many other people have similar symptoms to me.</td>
<td>4.89</td>
<td>1.70</td>
<td>-0.74</td>
</tr>
<tr>
<td>HP.5</td>
<td>doesn’t believe that I have the amount of pain I describe, because I look too well.</td>
<td>2.95</td>
<td>1.70</td>
<td>0.62</td>
</tr>
<tr>
<td>HP.6</td>
<td>does not seem to really believe that I have a pain condition.</td>
<td>2.63</td>
<td>1.59</td>
<td>0.86</td>
</tr>
<tr>
<td>HP.7</td>
<td>talks to me about my pain condition as if it is not real.</td>
<td>2.50</td>
<td>1.57</td>
<td>0.98</td>
</tr>
<tr>
<td>HP.8</td>
<td>seems to think my pain is all psychological rather than physical.</td>
<td>2.68</td>
<td>1.71</td>
<td>0.86</td>
</tr>
<tr>
<td>HP.9</td>
<td>seems to judge me negatively when I ask for more pain medication.</td>
<td>2.85</td>
<td>1.71</td>
<td>0.58</td>
</tr>
<tr>
<td>HP.10</td>
<td>seems to genuinely care about my pain.</td>
<td>4.90</td>
<td>1.56</td>
<td>-0.74</td>
</tr>
<tr>
<td>HP.11</td>
<td>doesn’t take me seriously when I talk about my pain.</td>
<td>2.82</td>
<td>1.69</td>
<td>0.73</td>
</tr>
<tr>
<td>HP.12</td>
<td>seems to think I am faking or exaggerating my symptoms.</td>
<td>2.70</td>
<td>1.66</td>
<td>0.78</td>
</tr>
<tr>
<td>HP.13</td>
<td>seems irritated with me for my ongoing pain.</td>
<td>2.53</td>
<td>1.54</td>
<td>0.98</td>
</tr>
<tr>
<td>HP.14</td>
<td>does not take the time to fully understand about my pain condition.</td>
<td>3.12</td>
<td>1.85</td>
<td>0.52</td>
</tr>
<tr>
<td>HP.15</td>
<td>makes me feel guilty whenever I tell them about my pain.</td>
<td>2.57</td>
<td>1.63</td>
<td>0.99</td>
</tr>
<tr>
<td>HP.16</td>
<td>values my input when making decisions about my treatment plan.</td>
<td>4.64</td>
<td>1.52</td>
<td>-0.50</td>
</tr>
<tr>
<td>HP.17</td>
<td>takes my preferences into account when deciding on a treatment plan.</td>
<td>4.80</td>
<td>1.43</td>
<td>-0.62</td>
</tr>
</tbody>
</table>
### Subscale items : Over-validation

<table>
<thead>
<tr>
<th>Subscale</th>
<th>Item Description</th>
<th>Mean</th>
<th>S.D.</th>
<th>Skew</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ov.2_</td>
<td>Immediate others ...who know about my pain make too much of a big deal about it.</td>
<td>2.92</td>
<td>1.56</td>
<td>0.52</td>
</tr>
<tr>
<td>Ov.3_</td>
<td>Immediate others ...assume I cannot do tasks that I am capable of.</td>
<td>3.13</td>
<td>1.64</td>
<td>0.43</td>
</tr>
<tr>
<td>Ov.4_</td>
<td>Immediate others ...encourage me to rest and not to push myself.</td>
<td>4.39</td>
<td>1.70</td>
<td>-0.43</td>
</tr>
<tr>
<td>Ov.6_</td>
<td>Immediate others ...are too interfering while they are trying to help me.</td>
<td>3.15</td>
<td>1.65</td>
<td>0.36</td>
</tr>
<tr>
<td>Ov.7_</td>
<td>Immediate others ...encourage me to function more independently.</td>
<td>4.20</td>
<td>1.43</td>
<td>-0.36</td>
</tr>
<tr>
<td>Ov.8_</td>
<td>Immediate others ...tend to take over tasks that I could do myself.</td>
<td>3.28</td>
<td>1.69</td>
<td>0.30</td>
</tr>
<tr>
<td>Ov.10_</td>
<td>Immediate others ...try to stop me doing tasks because they think it will make my pain worse.</td>
<td>3.68</td>
<td>1.86</td>
<td>0.03</td>
</tr>
<tr>
<td>Ov.11_</td>
<td>Immediate others ...do most physical tasks for me.</td>
<td>2.98</td>
<td>1.80</td>
<td>0.54</td>
</tr>
<tr>
<td>Ov.12_</td>
<td>Immediate others ...seem to prefer it when I am dependent on them.</td>
<td>2.66</td>
<td>1.58</td>
<td>0.64</td>
</tr>
<tr>
<td>Ov.13_</td>
<td>Immediate others ...make it difficult for me to remain independent.</td>
<td>2.51</td>
<td>1.50</td>
<td>0.71</td>
</tr>
<tr>
<td>Ov.14_</td>
<td>Immediate others ...comment positively on occasions that I have shown improvement in my ability to perform painful tasks.</td>
<td>4.34</td>
<td>1.58</td>
<td>-0.54</td>
</tr>
<tr>
<td>Ov.15_</td>
<td>Immediate others ...don't seem to believe that I am capable of doing things myself, in my condition.</td>
<td>2.85</td>
<td>1.56</td>
<td>0.47</td>
</tr>
<tr>
<td>Ov.16_</td>
<td>Immediate others ...encourage me to stay as active as possible.</td>
<td>4.99</td>
<td>1.47</td>
<td>-0.76</td>
</tr>
<tr>
<td>Ov.17_</td>
<td>Even though I have pain, I would like immediate others to let me do more things on my own.</td>
<td>4.41</td>
<td>1.54</td>
<td>-0.21</td>
</tr>
<tr>
<td>Ov.18_</td>
<td>I don’t want to do anything physical because I am scared of making my pain worse.</td>
<td>3.46</td>
<td>1.81</td>
<td>0.26</td>
</tr>
<tr>
<td>Ov.19_</td>
<td>I focus on little else all day besides my pain.</td>
<td>3.10</td>
<td>1.82</td>
<td>0.42</td>
</tr>
</tbody>
</table>

*Note. S = Pain-invalidation by the Self; IO = Pain-invalidation by immediate others; HP = Pain-invalidation by healthcare professionals; Ov = Over-validation. Items retained after PCA have been italicized.*
Factor loading and cross-loading. Data reduction was performed in an iterative manner for each subscale, eliminating items with the most obvious weaknesses in terms of fit, and re-running the analyses sequentially. Items with low loadings, or those with relatively low coefficients that cross-loaded on more than one factor, were discarded (Worthington & Whittaker, 2006). Such items eliminated from the ‘Self’ subscale included: S.5, S.7, S.10, S.11, S.15, S.18, S.19, and S.20 (Table 4.4). Low loading or cross-loading items eliminated from the ‘Immediate Others’ subscale included: IO.6, IO.12, IO.13, IO.14, IO.21, IO.23, IO.24, IO.25, IO.26, IO.28, IO.29, and IO.31 (Table 4.4). Similarly, items eliminated from the ‘Healthcare Professionals’ subscale included: HP.2, HP.3, HP.4, and HP.14 (Table 4.4); and the ‘Over-validation’ subscale items eliminated, accordingly, included: Ov.11, Ov.14, and Ov.17 (Table 4.4).

Item-total statistics. Once the bulk of item reduction has occurred, fine grade decisions on any remaining items to be eliminated may be assisted by reviewing the item-total statistics. Prior to assessing item-total statistics in SPSS it was necessary to apply reverse scoring to items where relevant (Field, 2013). The bulk of the items were negatively worded, for example, “Immediate others seem to get annoyed with me about my pain condition”, such that high item endorsement i.e. 6 = ‘Agree’ or 7 = ‘Strongly Agree’ would indicate invalidation of pain. Therefore, it was expected that positively worded items, for example, “Immediate others are generally sympathetic about my pain”, should be reverse scored. Before reverse scoring was applied, however, the loading coefficients for such items were checked to ensure that they were valanced appropriately (opposite to that of the negatively worded items on the same factor). Positively
worded items S.1, S.3, IO.2, HP.10, HP.16, HP.17, Ov.7 and Ov.16 (Table 4.4) performed as expected and were reverse scored accordingly.

An examination of item-total correlations provided useful information about the suitability of individual items, with values of > .30 deemed ‘good’ (Ferketich, 1991). On the ‘Self’ subscale, all items had a corrected item total > .40, except for the single positively worded item, S.1, “I am caring toward myself when I have pain”. Though the item had a low item-total correlation ($r = .14$), it was not eliminated at this stage because the value of including a positively worded item could not be ruled out without further analysis. All items on the ‘Immediate Others’ subscale had a corrected item-total of > .60; items on the ‘Healthcare Professionals’ subscale had a corrected item-total of > .40; and items on the ‘Over-validation’ subscale had a corrected item-total of > .30, except for the single positively worded item Ov.16 “Immediate others encourage me to stay as active as possible” ($r = .17$). This item was retained, again, because the value of at least one positively worded item per subscale had not been discounted at this stage of analysis.

The elimination of items in the late stages of EFA may also be guided by the objective to enhance scale reliability. One way to improve reliability is to optimise internal consistency, expressed by the Cronbach’s alpha ($\alpha$) coefficient. Cronbach’s alpha is a measure of the degree of interrelatedness of the assessed items, with a high coefficient indicating that the test is reliable in measuring the variance of items as a group (representing the construct) and contains less item-specific variance – also known as uniqueness (Cortina, 1993). After a process of item substitutions to elevate the alpha coefficient, items S.3 and S.6 (Table 4.4) were eliminated from the ‘Self’ subscale. In a similar fashion, item IO.7 from the
‘Immediate Others’ subscale, item HP.16 (Table 4.4) from the ‘Healthcare Professionals’ subscale, and items Ov.7 and Ov.12 (Table 4.4) from the ‘Over-validation’ subscale, were dropped to enhance Cronbach’s alpha of each subscale, respectively. With 9 items remaining in each subscale, the Cronbach’s coefficients were: $\alpha = .87$ (‘Self’), $\alpha = .93$ (‘Immediate Others’), $\alpha = .93$ (‘Healthcare Professionals’), and $\alpha = .83$ (‘Over-validation’). Table 4.5 shows the final list of 36 items remaining after EFA, including item-total statistics.
Table 4.5. Pain-validation items remaining after PCA; and item-total statistics.

<table>
<thead>
<tr>
<th>Immediate Others subscale</th>
<th>Item</th>
<th>Corrected Item-Total Correlation</th>
<th>Cronbach's Alpha if Item Deleted</th>
</tr>
</thead>
<tbody>
<tr>
<td>IO.2</td>
<td>...are generally sympathetic about my pain.</td>
<td>0.64</td>
<td>0.92</td>
</tr>
<tr>
<td>IO.3</td>
<td>...don’t seem to believe that I have pain because I look well.</td>
<td>0.70</td>
<td>0.92</td>
</tr>
<tr>
<td>IO.4</td>
<td>...seem to get annoyed with me about my pain condition.</td>
<td>0.73</td>
<td>0.92</td>
</tr>
<tr>
<td>IO.5</td>
<td>...who hear about my pain condition seem to think that I am being weak.</td>
<td>0.77</td>
<td>0.92</td>
</tr>
<tr>
<td>IO.8</td>
<td>...seem disappointed in me because of my pain condition.</td>
<td>0.72</td>
<td>0.92</td>
</tr>
<tr>
<td>IO.11</td>
<td>...seem to think that I am exaggerating my pain symptoms.</td>
<td>0.70</td>
<td>0.92</td>
</tr>
<tr>
<td>IO.15</td>
<td>...say that I need to ‘toughen up’.</td>
<td>0.73</td>
<td>0.92</td>
</tr>
<tr>
<td>IO.16</td>
<td>...make me feel guilty for having pain.</td>
<td>0.80</td>
<td>0.92</td>
</tr>
<tr>
<td>IO.18</td>
<td>...don’t believe that my pain is real because there is no obvious evidence of it.</td>
<td>0.82</td>
<td>0.91</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Self subscale</th>
<th>Item</th>
<th>Corrected Item-Total Correlation</th>
<th>Cronbach's Alpha if Item Deleted</th>
</tr>
</thead>
<tbody>
<tr>
<td>S.1</td>
<td>I am caring toward myself when I have pain.</td>
<td>0.14</td>
<td>0.89</td>
</tr>
<tr>
<td>S.9</td>
<td>My pain condition makes me feel abnormal.</td>
<td>0.61</td>
<td>0.85</td>
</tr>
<tr>
<td>S.13</td>
<td>I don’t feel right talking about my pain because I know some other people have it worse than me.</td>
<td>0.47</td>
<td>0.87</td>
</tr>
<tr>
<td>S.14</td>
<td>I don’t talk about my pain because I don’t want to be a ‘whinger’.</td>
<td>0.55</td>
<td>0.86</td>
</tr>
<tr>
<td>S.16</td>
<td>I feel like I am letting my partner and/or close family members down because my pain limits me.</td>
<td>0.78</td>
<td>0.84</td>
</tr>
<tr>
<td>S.17</td>
<td>I don’t feel like I am contributing enough at home, because of my pain.</td>
<td>0.68</td>
<td>0.85</td>
</tr>
<tr>
<td>S.21</td>
<td>Sometimes my pain makes me feel useless.</td>
<td>0.71</td>
<td>0.84</td>
</tr>
<tr>
<td>S.22</td>
<td>Having a pain condition makes me feel undesirable.</td>
<td>0.70</td>
<td>0.84</td>
</tr>
<tr>
<td>S.23</td>
<td>I feel like a burden to others because of my pain condition.</td>
<td>0.77</td>
<td>0.84</td>
</tr>
</tbody>
</table>
### Table 4.5 continued…

<table>
<thead>
<tr>
<th>Healthcare Professionals subscale</th>
<th>Item</th>
<th>Corrected Item-Total Correlation</th>
<th>Cronbach's Alpha if Item Deleted</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>My healthcare professional...</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HP.5</td>
<td>Doesn’t believe that I have the amount of pain I describe, because I look too well.</td>
<td>0.81</td>
<td>0.91</td>
</tr>
<tr>
<td>HP.7</td>
<td>Talks to me about my pain condition as if it is not real.</td>
<td>0.82</td>
<td>0.91</td>
</tr>
<tr>
<td>HP.8</td>
<td>Seeks to think my pain is all psychological rather than physical.</td>
<td>0.76</td>
<td>0.92</td>
</tr>
<tr>
<td>HP.9</td>
<td>Seems to judge me negatively when I ask for more pain medication.</td>
<td>0.71</td>
<td>0.92</td>
</tr>
<tr>
<td>HP.10</td>
<td>Seems to genuinely care about my pain.</td>
<td>0.60</td>
<td>0.93</td>
</tr>
<tr>
<td>HP.12</td>
<td>Seems to think I am faking or exaggerating my symptoms.</td>
<td>0.83</td>
<td>0.91</td>
</tr>
<tr>
<td>HP.13</td>
<td>Seems irritated with me for my ongoing pain.</td>
<td>0.76</td>
<td>0.92</td>
</tr>
<tr>
<td>HP.15</td>
<td>Makes me feel guilty whenever I tell them about my pain.</td>
<td>0.83</td>
<td>0.91</td>
</tr>
<tr>
<td>HP.17</td>
<td>Takes my preferences into account when deciding on a treatment plan.</td>
<td>0.46</td>
<td>0.93</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Over-validation sub scale</th>
<th>Item</th>
<th>Corrected Item-Total Correlation</th>
<th>Cronbach's Alpha if Item Deleted</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Immediate others...</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ov.2</td>
<td>Who know about my pain make too much of a big deal about it.</td>
<td>0.51</td>
<td>0.82</td>
</tr>
<tr>
<td>Ov.3</td>
<td>Assume I cannot do tasks that I am capable of.</td>
<td>0.67</td>
<td>0.80</td>
</tr>
<tr>
<td>Ov.4</td>
<td>Encourage me to rest and not to push myself.</td>
<td>0.35</td>
<td>0.84</td>
</tr>
<tr>
<td>Ov.6</td>
<td>Are too interfering while they are trying to help me.</td>
<td>0.61</td>
<td>0.81</td>
</tr>
<tr>
<td>Ov.8</td>
<td>Tend to take over tasks that I could do myself.</td>
<td>0.69</td>
<td>0.80</td>
</tr>
<tr>
<td>Ov.10</td>
<td>Try to stop me doing tasks because they think it will make my pain worse.</td>
<td>0.59</td>
<td>0.81</td>
</tr>
<tr>
<td>Ov.13</td>
<td>Make it difficult for me to remain independent.</td>
<td>0.62</td>
<td>0.81</td>
</tr>
<tr>
<td>Ov.15</td>
<td>Don't seem to believe that I am capable of doing things myself, in my condition.</td>
<td>0.67</td>
<td>0.80</td>
</tr>
<tr>
<td>Ov.16</td>
<td>Encourage me to stay as active as possible.</td>
<td>0.17</td>
<td>0.85</td>
</tr>
</tbody>
</table>
Creation of a psychometric instrument that optimally measures a test construct is as much an art as it is a science. The effectiveness of the instrument can be enhanced or undermined at any level, including interpretation of the patient voice in the original narratives, articulating those issues in the form of true and representative scale items, and ensuring that items and response options are understood equally across all test-takers. Aside from decisions made on a statistical level, the ultimate outcome also relies on the researcher having enough knowledge about the topic area to make informed judgements when choosing between statistically similar, competing items. Thus, by the end of EFA, the resulting list is a carefully weighed set of items considered to be the best means of measuring the construct, both individually and as a group. The next stage of scale development is to confirm the strength of the relationships between the construct(s) being measured (latent variables) and the items designed to measure them (manifest variables). This process is known as Confirmatory Factor Analysis, and is detailed in Chapter 5.
Chapter References


Chapter 4: Scale Development


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CHAPTER 5

Study 3 – Part I: Confirming the Model

Following a comprehensive process of item development, EFA of the data resulting from survey distribution allowed for parsimonious grouping and reduction of items, retaining those which best represented the pain-validation construct (as detailed in Chapter 4). Determining the factors of pain-validation, and the most suitable items to measure them, allowed for the development of a model of relationships between the factors and their measures. The next stage of research involved a second survey distribution, providing data to test the factor structure and confirm the fit of the proposed model. This was achieved using confirmatory factor analysis (CFA), a form of structural equation modelling (SEM) used to test how well the a priori hypothesised model fits the data (Brown, 2015). A major reason for the popularity of SEM is its ability to analyze multiple variables simultaneously, compared to simpler techniques such as bivariate correlation (Schumacker & Lomax, 2016). In addition, the issue of measurement error and its impact on validity and reliability of the data, has been examined in recent years. Thus, the capacity for SEM to explicitly account for measurement error in the process of analysis is another advantage of its use (Schumacker & Lomax, 2016).

In the present research, EFA of the original 79 items, gave rise to 4 component constructs of Pain-validation, namely, ‘Pain-invalidation by the Self’, ‘Pain-invalidation by Immediate Others’, ‘Pain-invalidation by Healthcare Professionals’, and ‘Over-validation’. In the CFA process, these 4 factors are
known as latent variables. Response scores on the survey items are measurable. Thus, the items are known as observed variables (Byrne, 2016). Before commencing CFA, it is important to consider the latent variables, and their proposed relationships with the observed variables, to verify that they are reflected in the literature (Bentler & Chou, 1987; Schreiber, Nora, Stage, Barlow, & King, 2006). Examination of the model showed that the latent variables represented the themes found in the pain narratives and wider literature from which the original item pool was derived. The proposed causal relationships between the items and subscales were also logical with regard to the theoretical and qualitative literature. All subscales were deemed representative components of the higher-order construct, pain-validation, and thus it was assumed that they would correlate to some degree. The highest inter-correlation was predicted between the two subscales measuring (in)validation by others, ‘Pain-invalidation by Immediate Others’ and ‘Pain-invalidation by Healthcare Professionals’.

**Survey Distribution**

**Method**

**Design.** As in Study 2 (Chapter 4), CFA data was collected using Prolific, a crowdsourcing platform reaching an international participant base (Palan & Schitter, 2018). The survey was designed such that, following the pain-validation items, some additional measures included for construct validation (to be discussed later in the chapter) were presented to participants in random order, to prevent context effects (Tourangeau, Singer, & Presser, 2003), and order effects due to fatigue or diminishing motivation with progression through the survey (Ackerman & Kanfer, 2009; Krosnick, 1999). Survey instructions remained unchanged from
the EFA survey distribution (Appendix D). However, the midpoint (4) on the response scale was re-labelled, changing from ‘Neither Agree Nor Disagree’ to ‘Neutral’ as the meaning of the term neutral better reflected endorsement of a midpoint value, as opposed to having ‘no opinion’ regarding the item. The survey design was such that any item in a psychometric measure that was missing a response when the participant attempted to move to the next page would cause a message to appear on the screen, instructing participants to answer all present items before proceeding to the next page. Consequently, item responses were collected with no missing data. Participants were paid £1.50 each, an amount set in accordance with the estimated survey completion time of approximately 15 - 20 minutes.

Participants. The same selection criteria were applied for the recruitment of participants in the CFA survey distribution, as were applied in the initial EFA survey distribution (Study 2). Thus, participants were required to be aged between 18 and 65 years, having non-cancerous pain for longer than 3 months, with the pain not resulting from recent injury or surgery. An additional pre-screening tool, available in Prolific, allows for the exclusion of candidates who have participated in one of the researcher’s previous studies issued through the platform. In order to obtain new data with which to confirm the model, independent of that used in the EFA study (Bentler & Chou, 1987), individuals who had participated in the EFA survey round were screened out by creating a list of Prolific identification numbers of EFA study participants, and classifying them in Prolific as ineligible for participation in the CFA survey. Participant demographics are shown in Table 5.1.
Table 5.1. Demographics of participants in the CFA study.

<table>
<thead>
<tr>
<th>Participant Demographics</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sample size</strong></td>
</tr>
<tr>
<td><strong>Age</strong></td>
</tr>
<tr>
<td><strong>Gender</strong></td>
</tr>
<tr>
<td><strong>Nationality</strong></td>
</tr>
<tr>
<td><strong>Pain Condition</strong></td>
</tr>
</tbody>
</table>
**Procedure.** Data collection for CFA occurred in October, 2018. At the time of survey release, Prolific had 8,446 registered individuals who were eligible to participate after the pre-screening criteria had been applied. Participants viewed a brief paragraph describing the survey on the Prolific website, and those interested could follow the URL provided, taking them to the CFA pain-validation survey designed and accessed through the Qualtrics website. The survey consisted of an information page describing the nature and purpose of the study, followed by a question asking respondents to indicate their consent to participate. Those wishing to continue completed basic demographic questions, the pain-validation items retained after EFA, and some additional psychometric measures, including the Self-Compassion Scale-Short Form (SCS-SF; Raes, Pommier, Neff, & Van Gucht, 2011), the Brief Fear of Negative Evaluation scale (BFNE; Leary, 1983), the Pain Catastrophizing Scale (PCS; Sullivan, Bishop, & Pivik, 1995), and the Pain Self-Efficacy Questionnaire (PSEQ; Nicholas, 2007).

**Sample size.** As in EFA, the guidelines for recommended sample size in CFA vary, with some authors indicating a minimum sample size of 100-200 (Brown, 2015), while others suggest that a sample size smaller than 200 may be problematic (Kline, 2016). Further literature suggests that the decision should be based on the researcher’s goals in performing the analysis (Fabrigar, Porter, & Norris, 2010). For example, if the main focus is on the match between model and population parameter estimates, then a range of 5 – 10 responses per free parameter is advised (Bentler & Chou, 1987). In other circumstances, researchers may require a sample large enough to produce the statistical power to test model fit using particular indicators, or to determine the best fit out of competing models (Fabrigar et al., 2010). For the present study, responses were
obtained from 308 participants, providing a response to item ratio of > 8:1, and thus ample statistical power for the anticipated requirements of analysis (Bentler & Chou, 1987). The KMO statistic for the sample was .891, indicating good support for the adequacy of sample size (Allen & Bennett, 2012; Worthington & Whittaker, 2006). The anti-image correlation matrix also showed strong support for sampling adequacy regarding individual items, with a KMO statistic of > .70 for all but 3 items, reporting (still acceptable) values between .65 - .70 (Field, 2013).

**Data preparation.** Examination of the data descriptives, presented in Table 5.2, revealed no issues of concern. The degrees of skew and kurtosis were checked on all items for indications of non-normal data distribution. All items had a skew coefficient of < 1.0, with the exception of item HP.7 (having a value of 1.05). Item S.23 had the most extreme kurtosis coefficient (-1.26). Skew and kurtosis values in this low range indicated normal univariate data distribution for all measured variables (Lei & Lomax, 2005). Furthermore, examination of frequency histograms and vertical boxplots for each variable showed an absence of outliers. Bartlett’s test of sphericity was also significant, $p < .001$, indicating that the data was suitable for factor analysis (Field, 2013).
## Table 5.2  Pain-validation item descriptives

<table>
<thead>
<tr>
<th>Subscale items : <strong>Invalidation by the Self</strong></th>
<th>Mean</th>
<th>SD</th>
<th>Skew</th>
<th>Kurtosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>S.1_ I am caring toward myself when I am in pain.</td>
<td>3.07</td>
<td>1.43</td>
<td>0.68</td>
<td>-0.22</td>
</tr>
<tr>
<td>S.9_ My pain condition makes me feel abnormal.</td>
<td>4.73</td>
<td>1.67</td>
<td>-0.49</td>
<td>-0.63</td>
</tr>
<tr>
<td>S.13_ I don't feel right talking about my pain because I know some other people have it worse than me.</td>
<td>5.05</td>
<td>1.72</td>
<td>-0.83</td>
<td>-0.18</td>
</tr>
<tr>
<td>S.14_ I don't talk about my pain because I don't want to be 'whinger'.</td>
<td>5.20</td>
<td>1.65</td>
<td>-0.99</td>
<td>0.17</td>
</tr>
<tr>
<td>S.16_ I feel like I am letting my partner and/or close family members down because my pain limits me.</td>
<td>4.48</td>
<td>1.94</td>
<td>-0.37</td>
<td>-1.10</td>
</tr>
<tr>
<td>S.17_ I don't feel like I am contributing enough at home, because of my pain</td>
<td>4.50</td>
<td>1.90</td>
<td>-0.27</td>
<td>-1.15</td>
</tr>
<tr>
<td>S.21_ Sometimes my pain makes me feel useless.</td>
<td>5.08</td>
<td>1.80</td>
<td>-0.83</td>
<td>-0.37</td>
</tr>
<tr>
<td>S.22_ Having a pain condition makes me feel undesirable.</td>
<td>4.48</td>
<td>1.80</td>
<td>-0.37</td>
<td>-0.94</td>
</tr>
<tr>
<td>S.23_ I feel like a burden to others because of my pain condition.</td>
<td>4.38</td>
<td>1.97</td>
<td>-0.23</td>
<td>-1.26</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Subscale items : <strong>Invalidation by Immediate Others</strong></th>
<th>Mean</th>
<th>SD</th>
<th>Skew</th>
<th>Kurtosis</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Immediate others...</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IO.2_...are generally sympathetic about my pain.</td>
<td>2.79</td>
<td>1.35</td>
<td>0.91</td>
<td>0.49</td>
</tr>
<tr>
<td>IO.3_...don’t seem to believe that I have pain because I look well.</td>
<td>3.40</td>
<td>1.80</td>
<td>0.25</td>
<td>-1.15</td>
</tr>
<tr>
<td>IO.4_...seem to get annoyed with me about my pain condition.</td>
<td>3.12</td>
<td>1.74</td>
<td>0.53</td>
<td>-0.82</td>
</tr>
<tr>
<td>IO.5_...who hear about my pain condition seem to think that I am being weak.</td>
<td>2.90</td>
<td>1.59</td>
<td>0.58</td>
<td>-0.64</td>
</tr>
<tr>
<td>IO.8_...seem disappointed in me because of my pain condition.</td>
<td>2.75</td>
<td>1.55</td>
<td>0.64</td>
<td>-0.46</td>
</tr>
<tr>
<td>IO.11_...seem to think that I am exaggerating my pain symptoms.</td>
<td>3.48</td>
<td>1.92</td>
<td>0.25</td>
<td>-1.24</td>
</tr>
<tr>
<td>IO.15_...say that I need to ‘toughen up’.</td>
<td>2.84</td>
<td>1.81</td>
<td>0.83</td>
<td>-0.45</td>
</tr>
<tr>
<td>IO.16_...make me feel guilty for having pain.</td>
<td>2.82</td>
<td>1.75</td>
<td>0.70</td>
<td>-0.63</td>
</tr>
<tr>
<td>IO.18_...don’t believe that my pain is real because there is no obvious evidence of it.</td>
<td>2.87</td>
<td>1.79</td>
<td>0.64</td>
<td>-0.78</td>
</tr>
</tbody>
</table>
### Chapter 5: Confirming the Model

#### Subscale items : Invalidation by Healthcare Professionals

<table>
<thead>
<tr>
<th>Subscale items</th>
<th>Mean</th>
<th>SD</th>
<th>Skew</th>
<th>Kurtosis</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>HP.5_</strong> ...doesn’t believe that I have the amount of pain I describe, because I look too well.</td>
<td>2.97</td>
<td>1.71</td>
<td>0.57</td>
<td>-0.85</td>
</tr>
<tr>
<td><strong>HP.7_</strong> ...talks to me about my pain condition as if it is not real.</td>
<td>2.66</td>
<td>1.63</td>
<td>1.05</td>
<td>0.20</td>
</tr>
<tr>
<td><strong>HP.8_</strong> ...seems to think my pain is all psychological rather than physical.</td>
<td>2.70</td>
<td>1.66</td>
<td>0.94</td>
<td>-0.09</td>
</tr>
<tr>
<td><strong>HP.9_</strong> ...seems to judge me negatively when I ask for more pain medication.</td>
<td>2.85</td>
<td>1.62</td>
<td>0.74</td>
<td>-0.32</td>
</tr>
<tr>
<td><strong>HP.10_</strong> ...seems to genuinely care about my pain.</td>
<td>3.23</td>
<td>1.53</td>
<td>0.71</td>
<td>-0.17</td>
</tr>
<tr>
<td><strong>HP.12_</strong> ...seems to think I am faking or exaggerating my symptoms.</td>
<td>2.77</td>
<td>1.66</td>
<td>0.77</td>
<td>-0.48</td>
</tr>
<tr>
<td><strong>HP.13_</strong> ...seems irritated with me for my ongoing pain.</td>
<td>2.69</td>
<td>1.65</td>
<td>0.86</td>
<td>-0.18</td>
</tr>
<tr>
<td><strong>HP.15_</strong> ...makes me feel guilty whenever I tell them about my pain.</td>
<td>2.57</td>
<td>1.63</td>
<td>0.91</td>
<td>-0.20</td>
</tr>
<tr>
<td><strong>HP.17_</strong> ...takes my preferences into account when deciding on a treatment plan.</td>
<td>3.35</td>
<td>1.63</td>
<td>0.64</td>
<td>-0.43</td>
</tr>
</tbody>
</table>

#### Subscale items : Over-validation

<table>
<thead>
<tr>
<th>Subscale items</th>
<th>Mean</th>
<th>SD</th>
<th>Skew</th>
<th>Kurtosis</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Ov.2_</strong> Immediate others ...who know about my pain make too much of a big deal about it.</td>
<td>2.65</td>
<td>1.38</td>
<td>0.79</td>
<td>-0.12</td>
</tr>
<tr>
<td><strong>Ov.3_</strong> Immediate others ...assume I cannot do tasks that I am capable of.</td>
<td>3.17</td>
<td>1.66</td>
<td>0.39</td>
<td>-0.96</td>
</tr>
<tr>
<td><strong>Ov.4_</strong> Immediate others ...encourage me to rest and not to push myself.</td>
<td>4.46</td>
<td>1.60</td>
<td>-0.56</td>
<td>-0.52</td>
</tr>
<tr>
<td><strong>Ov.6_</strong> Immediate others ...are too interfering while they are trying to help me.</td>
<td>2.85</td>
<td>1.54</td>
<td>0.65</td>
<td>-0.45</td>
</tr>
<tr>
<td><strong>Ov.8_</strong> Immediate others ...tend to take over tasks that I could do myself.</td>
<td>3.10</td>
<td>1.63</td>
<td>0.46</td>
<td>-0.88</td>
</tr>
<tr>
<td><strong>Ov.10_</strong> Immediate others ...try to stop me doing tasks because they think it will make my pain worse.</td>
<td>3.48</td>
<td>1.79</td>
<td>0.24</td>
<td>-1.16</td>
</tr>
<tr>
<td><strong>Ov.13_</strong> Immediate others ...make it difficult for me to remain independent.</td>
<td>2.62</td>
<td>1.49</td>
<td>0.72</td>
<td>-0.43</td>
</tr>
<tr>
<td><strong>Ov.15_</strong> Immediate others ...don't seem to believe that I am capable of doing things myself, in my condition.</td>
<td>2.78</td>
<td>1.53</td>
<td>0.60</td>
<td>-0.71</td>
</tr>
<tr>
<td><strong>Ov.16_</strong> Immediate others ...encourage me to stay as active as possible.</td>
<td>3.30</td>
<td>1.46</td>
<td>0.57</td>
<td>-0.23</td>
</tr>
</tbody>
</table>
Before proceeding to CFA the data from this second survey distribution was first assessed via EFA to determine whether the proposed 4 factor model was still relevant. EFA was performed on the 36 pain-validation items, using principal components analysis with oblimin rotation (as discussed in Chapter 4). Based on Eigenvalues > 1 (Floyd & Widaman, 1995), 6 factors were initially extracted, including the 4 subscales theorized a priori: ‘Invalidation by the Self’ (S), ‘Invalidation by Immediate Others’ (IO), ‘Invalidation by Healthcare Professionals’ (HP), and ‘Over-validation’ (Ov). The fifth factor, which appeared to be themed ‘the right to express pain’ contained only 2 items, S.13 “I don’t feel right talking about my pain because I know some other people have it worse than me”, and item S.14 “I don’t talk about my pain because I don’t want to be a ‘whinger’”. The sixth factor contained 5 positively worded items, three of which (S.1, HP.17, and Ov.16) did not load on any other factor. The remaining 2 positively worded items, IO.2 and HP.10, cross-loaded onto their anticipated subscale factor, but in both cases they constituted the weakest loading item on that factor.

Given that items on the sixth factor were the poorest performers, compared to all other items on their associated subscales in the initial study, and their loading issues in the current distribution, the positively worded items (S.1, IO.2, HP.10, HP.17, and Ov.16) were eliminated. In addition, item Ov.4 “Immediate others encourage me to rest and not to push myself” was eliminated as it cross-loaded on 2 factors ‘Invalidation by Immediate others’ and ‘Over-validation’, with both loadings being quite poor at -.48 (also negatively valanced against all others on the same factor) and .34, respectively.
A correlation matrix of all 36 pain-validation items was also generated to identify any items correlating ≥ .80, potentially indicating redundancies. Two such relationships were found, between items HP.12 and HP.13 (\(r = .82\)), and items HP.13 and HP.15 (\(r = .85\)). Though the elimination of item HP.13 would have remedied both of these correlation issues, item removal in this instance was deferred until after CFA was performed, in case the preferential removal of items HP.12 and HP.15 were indicated by the model fit indices.

**Confirmatory Factor Analysis**

CFA was performed on the remaining 30 items using the statistical software package AMOS (Analysis of Moment Structures), version 24. In choosing an estimation method for CFA however, it was important to consider whether the estimator would rely on the assumption of multivariate normality in the data. The use of estimators that fail to account for nonnormality can be problematic with nonnormal data, potentially producing biased parameter estimates, inflating the chi-square statistic, and increasing the chance of rejecting a correct model (Curran, West, & Finch, 1996; Gao, Mokhtarian, & Johnston, 2008; West, Finch, & Curran, 1995). Studies suggest that the majority of samples in social and behavioural research exhibit multivariate nonnormality (Cain, Zhang, & Yuan, 2016; Micceri, 1989).

Multivariate normality can be assessed by examining the multivariate kurtosis value and Mardia’s normalized estimate of multivariate kurtosis (critical ratio), as reported in AMOS (Byrne, 2016). Deviations from multivariate normality are indicated by a critical ratio > 1.96 (Gao et al., 2008). In the present study, univariate normality for all variables had been established via SPSS.
However, the 30-item model showed a multivariate kurtosis value of 219.56, and a critical ratio of 43.97, indicating multivariate nonnormality for the data.

A popular choice of estimator is the maximum likelihood (ML) method, since the estimates tend to be unbiased, scale-invariant, and efficient compared to others such as the unweighted least squared estimator (Schumacker & Lomax, 2016). However, given that certain estimators such as ML rely on the assumption of multivariate normality, statistical researchers have developed estimators capable of dealing with nonnormal data such as the Asymptotically Distribution-Free (ADF) method (Byrne, 2016). A limitation of ADF is its poor performance on sample sizes < 1000 (West et al., 1995).

Another solution to the estimation problems raised by nonnormal data is achieved via the use of bootstrapping, which involves random re-sampling (with replacement) of the data, a prescribed number of times (Zhu, 1997). This allows for the comparison of a given parameter’s distribution, to the distribution of each of the bootstrap-generated samples. Thus, the method is not bound by the same assumptions associated with traditional parametric tests (Zhu, 1997). As a technique suited to moderate sample sizes (Byrne, 2016), 1000 bootstrapped samples were generated in AMOS using Bollen-Stine bootstrapping with ML estimation, in conducting CFA on the 30-item model shown in Figure 5.1.

Model fit indices provide an indication of how well the proposed model fits the data. There are numerous indicator types employing different approaches to determine the closeness of model fit. For example, the chi-square ($\chi^2$) test assumes a null hypothesis that the model being tested has a perfect fit to the data. Thus, a chi-square result with a significant $p$ value ($< .05$) indicates that the
hypothesis should be rejected, and that the model does not fit the data (Sun, 2005). It is well known, however, that the chi-square test is highly sensitive to sample size, and that the likelihood of a perfect chi-square fit decreases with increased sample size (Bentler & Bonett, 1980; Browne & Cudeck, 1993). Thus, researchers have often based model fit decisions on a range of indices (Worthington & Whittaker, 2006).

A good blend of indices, recommended by Worthington and Whittaker (2006), includes the chi-square and the standardized root mean residual (SRMR) which are sample-based absolute fit indices, together with the root mean square error of approximation (RMSEA) – a population-based absolute fit index, and the comparative fit index (CFI) – a population-based relative fit index. Beyond the chi-square test, acceptable model fit is generally determined by whether the model achieves values inside the cut-off criteria for the relevant indices, such as ≤.05 for good fit and .05 - .08 deemed fair fit for RMSEA (Browne & Cudeck, 1993; Hu & Bentler, 1999), >.90 - .95 for CFI, and <.08 for SRMR (Hu & Bentler, 1999).

Indicators for the 30-item model, shown in Table 5.3, suggested inadequate model fit. The modification index (MI) and the residual correlations and covariances provide indications of where the notable discrepancies are, between the theorised model and the actual sample data (Maydeu-Olivares & Shi, 2017). This may be highlighted by MI values ≥ 10 (Byrne, 2016), and standardized residual covariances (SRC) with an absolute value > 2.58 (Field, 2013). An examination of the 30-item model (Figure 5.1) showed high MI and SRC values for items S.13, S.14, IO.3, and Ov.10 which were thus eliminated, leaving 26 items in the model (Figure 5.2).
Table 5.3. Fit indices for the Pain-Validation Scale models.

<table>
<thead>
<tr>
<th></th>
<th>$\chi^2$</th>
<th>$df$</th>
<th>$p$</th>
<th>SRMR</th>
<th>CFI</th>
<th>RMSEA</th>
</tr>
</thead>
<tbody>
<tr>
<td>30-item model</td>
<td>1135.16</td>
<td>399</td>
<td>.001</td>
<td>.066</td>
<td>.887</td>
<td>.078</td>
</tr>
<tr>
<td>26-item model</td>
<td>656.07</td>
<td>293</td>
<td>.001</td>
<td>.050</td>
<td>.936</td>
<td>.064</td>
</tr>
<tr>
<td>24-item model</td>
<td>508.39</td>
<td>246</td>
<td>.001</td>
<td>.049</td>
<td>.946</td>
<td>.059</td>
</tr>
<tr>
<td>20-item model</td>
<td>314.69</td>
<td>164</td>
<td>.001</td>
<td>.051</td>
<td>.962</td>
<td>.055</td>
</tr>
</tbody>
</table>

*Note.* SMSR = standardized root mean residual; CFI = comparative fit index; RMSEA = root mean square error of approximation. Acceptable values for goodness of fit indices are <.08 for SRMR, .90 - .95 for CFI, and .05 - .08 for RMSEA.

Table 5.4. Correlations between the pain-validation subscales.

<table>
<thead>
<tr>
<th></th>
<th>Self</th>
<th>IO</th>
<th>HP</th>
<th>Over</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IO</td>
<td>.28**</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HP</td>
<td>.24**</td>
<td>.37**</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Over</td>
<td>.29**</td>
<td>.23**</td>
<td>.19**</td>
<td>-</td>
</tr>
</tbody>
</table>

*Note.* ** Correlation is significant at the 0.01 level (2-tailed). $N = 308$

Self = ‘Invalidation by the Self’ subscale; IO = ‘Invalidation by Immediate Others’ subscale; HP = ‘Invalidation by Healthcare Professionals’ subscale; Over = ‘Over-validation’ subscale.
Figure 5.1. Four-factor, 30-item structural model of pain-validation.

Note. Observed variables are represented in rectangles. Latent variables are represented in ellipses. Arrowed lines indicate regression paths and standardized regression weights. Curved lines represent correlational relationships between latent variables.
Figure 5.2. Four-factor, 26-item structural model of pain-validation.

Note. Observed variables are represented in rectangles. Latent variables are represented in ellipses. Arrowed lines indicate regression paths and standardized regression weights. Curved lines represent correlational relationships between latent variables.
Figure 5.3. Four-factor, 24-item structural model of pain-validation.

Note. Observed variables are represented in rectangles. Latent variables are represented in ellipses. Arrowed lines indicate regression paths and standardized regression weights. Curved lines represent correlational relationships between latent variables.
The CFA was re-run using the remaining 26 items, achieving somewhat better fit outcomes, as seen in Table 5.3. At this stage the removal of item HP.13 was deemed appropriate, given that the items it correlated highly with, as noted previously (HP.12 and HP.15), fit the model comparatively well. Six items remained on each subscale, except for the ‘Invalidation by Immediate Others’ subscale which still had 7 items. Thus, items on the ‘Invalidation by Immediate Others’ subscale were reviewed, taking into consideration the MI and SRC values, together with the change in internal consistency of the subscale, measured by the ‘alpha if item removed’ value. Removal of item IO.8 allowed the most optimal combination of model fit and internal consistency.

CFA was performed on the resulting 24-item model (shown in Figure 5.3), using 1000 Bollen-Stine bootstrapped samples with ML estimation, with a 95% bias-corrected confidence level. The resulting model fit indices, shown in Table 5.3, again indicated an improved fit. Correlations between the subscales ranged from .19 to .37, shown in Table 5.4. As predicted, the subscales measuring ‘Invalidation by Immediate Others’ and ‘Invalidation by Healthcare Professionals’ had the strongest of all subscale intercorrelations \( r = .37 \). With weak to moderate positive correlations between the factors, the presence of a general common relationship (measurement of pain-validation level) was implied. However, weak to moderate inter-factor correlations, together with high internal consistencies within each factor, and logical reasoning based on a theoretical understanding of the construct, indicated that the subscales were measuring individual sub-components of pain-validation. This finding indicated that test respondents may be better evaluated by assessment on each subscale, separately. Thus, an important priority in the scale design henceforth, was to maintain the capacity for
the pain-validation subscales to remain discretely measurable components. This became particularly relevant when deciding whether to reduce the model by a further item per factor.

A 20-item model was tested, revealing a marginal improvement in model fit, compared to the 24-item model. However, the removal of the poorest fit (or any) item from each subscale in the 24-item model, reduced the internal consistency of all but one (‘Invalidation by the Self’) subscale. Importantly too, a reduction from 6 to 5 items measuring each of the 4 components may have caused a substantial loss in the breadth of item representation of the broader pain-validation construct (DeVellis, 2017), and its subcomponents. It was therefore deemed that the slight improvement shown in the fit of the 20-item model was not enough to offset the loss of internal consistency and construct representation resulting from reducing the 24-item model to 20 items. Though the chi-square test indicated a non-perfect fit – as expected due to the sensitivity of the index and given the present sample size (Browne & Cudeck, 1993), the remaining fit indices suggested acceptable fit for the 24-item model, and it was regarded as the optimal pain-validation measure overall. Table 5.5 shows the final list of Pain-Validation Scale items, and item-total statistics.
Table 5.5. Pain-Validation Scale items including item-total statistics.

<table>
<thead>
<tr>
<th>Item</th>
<th>Corrected item-total correlation</th>
<th>Cronbach's alpha if item deleted</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Invalidation by the Self</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Self_9  My pain condition makes me feel abnormal.</td>
<td>.58</td>
<td>.91</td>
</tr>
<tr>
<td>Self_16 I feel like I am letting my partner or close family members</td>
<td>.81</td>
<td>.88</td>
</tr>
<tr>
<td>limits me.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Self_17 I don't feel like I am contributing enough at home, because</td>
<td>.76</td>
<td>.89</td>
</tr>
<tr>
<td>of my pain.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Self_21 Sometimes my pain makes me feel useless.</td>
<td>.80</td>
<td>.88</td>
</tr>
<tr>
<td>Self_22 Having a pain condition makes me feel undesirable.</td>
<td>.68</td>
<td>.90</td>
</tr>
<tr>
<td>Self_23 I feel like a burden to others because of my pain condition.</td>
<td>.84</td>
<td>.88</td>
</tr>
<tr>
<td><strong>Invalidation by Immediate Others</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Imm.Oth_4 ... seem to get annoyed with me about my pain condition.</td>
<td>.72</td>
<td>.90</td>
</tr>
<tr>
<td>Imm.Oth_5 ... who hear about my pain condition seem to think that</td>
<td>.78</td>
<td>.90</td>
</tr>
<tr>
<td>I am being weak.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Imm.Oth_11 ... seem to think that I am exaggerating my pain</td>
<td>.80</td>
<td>.89</td>
</tr>
<tr>
<td>symptoms.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Imm.Oth_15 ... say that I need to 'toughen up'</td>
<td>.73</td>
<td>.90</td>
</tr>
<tr>
<td>Imm.Oth_16 ... make me feel guilty for having pain.</td>
<td>.77</td>
<td>.90</td>
</tr>
<tr>
<td>Imm.Oth_18 ... don't believe that my pain is real because there is</td>
<td>.77</td>
<td>.90</td>
</tr>
<tr>
<td>no obvious evidence of it.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

... table continued over page
### Table 5.5 continued…

<table>
<thead>
<tr>
<th>Item</th>
<th>Corrected item-total correlation</th>
<th>Cronbach's alpha if item deleted</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Invalidation by Healthcare Professional</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>My healthcare professional…</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HP_5 …doesn't believe that I have the amount of pain I describe, because I look too well.</td>
<td>.80</td>
<td>.91</td>
</tr>
<tr>
<td>HP_7 …talks to me about my pain condition as if it not real.</td>
<td>.82</td>
<td>.91</td>
</tr>
<tr>
<td>HP_8 …seems to think my pain is all psychological rather than physical.</td>
<td>.76</td>
<td>.92</td>
</tr>
<tr>
<td>HP_9 …seems to judge me negatively when I ask for more pain medication.</td>
<td>.72</td>
<td>.92</td>
</tr>
<tr>
<td>HP_12 …seems to think I am faking or exaggerating my symptoms.</td>
<td>.83</td>
<td>.91</td>
</tr>
<tr>
<td>HP_15 …makes me feel guilty whenever I tell them about my pain.</td>
<td>.81</td>
<td>.91</td>
</tr>
<tr>
<td><strong>Over-validation</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Immediate others…</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Over_2 …who know about my pain make too much of a big deal about it</td>
<td>.56</td>
<td>.87</td>
</tr>
<tr>
<td>Over_3 …assume I cannot do tasks that I am capable of.</td>
<td>.71</td>
<td>.85</td>
</tr>
<tr>
<td>Over_6 …are too interfering while they are trying to help me.</td>
<td>.64</td>
<td>.86</td>
</tr>
<tr>
<td>Over_8 …tend to take over tasks that I could do myself.</td>
<td>.67</td>
<td>.86</td>
</tr>
<tr>
<td>Over_13 …make it difficult for me to remain independent.</td>
<td>.75</td>
<td>.84</td>
</tr>
<tr>
<td>Over_15 …don't seem to believe that I am capable of doing things myself, in my condition.</td>
<td>.76</td>
<td>.84</td>
</tr>
</tbody>
</table>
The themes arising from the analysis of pain narratives (Study 1) were well represented in the final selection of items in the P-VS. Items from the first subscale, ‘Invalidation by the Self’ were most strongly centred on critical self-judgement and a lack of compassion (for the self). Items from the subscales ‘Invalidation by Immediate Others’ and ‘Invalidation by Healthcare Professionals’ reflected multiple themes with an even blend of not being believed, lack of compassion, lack of awareness / understanding, and feeling stigmatized. Items in the ‘Over-validation’ subscale predominantly emphasized a lack of awareness / understanding and, to a lesser extent, a sense of feeling stigmatized.

This chapter has outlined the methods and reasoning used to determine the items that are most effective for measuring problematic levels of invalidation or over-validation in individuals with chronic pain. Good fit of the hypothesized model – as determined in this chapter – is an indicator of construct validity (Worthington & Whittaker, 2006). However, further investigations into the validity and reliability of the final 24-item model are shown in the following chapter, together with an exploration of how the P-VS correlates with other relevant construct measures. The full 24-item P-VS is shown in Appendix E.
Chapter References


Chapter 5: Confirming the Model


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A sound measure of any construct must demonstrate two criteria. Firstly, the instrument used in testing a given individual must be reliable. That is, it must be able to consistently produce a score that is representative of the true state of an individual, with regards to the construct being measured (DeVellis, 2017). Secondly, an instrument selected to assess a particular construct must measure the designated construct. The extent to which an instrument is found to do so indicates the validity of inferences one can make based on the test’s results (Trochim, Donnelly, & Arora, 2016). Part I of Study 3, described in the previous chapter, was designed to confirm the collection of items that best represents, and most effectively measures pain-validation in people with chronic pain. This chapter (Part II) builds on Study 3, providing an assessment of the reliability of the Pain-Validation Scale (P-VS) and its ability to allow the user to make valid conclusions when interpreting test results.

The term validity is often used in describing the quality of a test. Several authors, however, assert that use of the term validity should instead be applied to the interpretations and conclusions drawn upon observation of the test scores (Cizek, 2012; Downing, 2003; Lenz & Wester, 2017; Trochim, et al., 2016). The Standards for Educational and Psychological Testing (American Educational Research Association [AERA], American Psychological Association [APA], & National Council on Measurement in Education [NCME], 2014) contend, as proffered by Messick (1995), that validity can be understood as a unitary concept, and described as the degree to which the interpretation of scores, as intended in a
given test, is supported by the evidence accrued. By this conceptualization, validity can be viewed more comprehensively, and is not limited to the traditionally defined groupings of content validity, criterion-related validity, and construct validity (Brown, 2010; Downing, 2003; Messick, 1995).

The focus of the current Standards publication (AERA, APA, & NCME, 2014) is on collecting evidence for validity from a variety of sources related to (i) test content, (ii) response processes, (iii) internal structure, (iv) relationship to other variables, and (v) consequences of testing. Firstly, establishing validity through test content involves consideration of the item format and wording, scoring of items, how the test is administered, and how well the content of the test represents all-inclusive domains of the test construct (AERA, APA, & NCME, 2014). Secondly, if test takers are assumed to interpret test items in a certain way, then the validity of a test may be affected by any deviation from that assumption. Therefore, evidence for validity related to response processes can be obtained by analyzing individual responses, response time taken, eye tracking analysis, interviewing participants to determine their response strategies or interpretation of test items (Padilla & Benitez, 2014). In the case that participant responses are evaluated or recorded by researchers, validity of response processes also includes the consistency with which researchers judge and record participant behaviours (AERA, APA, & NCME, 2014). Thirdly, validity evidence based on internal structure includes aspects such as dimensionality, inter-item correlations, factor analysis, differential item functioning, and model testing (Downing, 2003; Lenz & Wester, 2017). Indications of sound internal structure are also suggested by means typically considered as forms of reliability namely, measures of internal consistency, inter-rater reliability, and consistency of test scores when repeated
across time (Brown, 2010; Downing, 2003; Lenz & Wester, 2017). It is noteworthy that measures of reliability, traditionally discussed as a discrete test quality, are subsumed under the current conceptualization of validity, as evidence of validity related to internal structure.

The fourth source of evidence contributing to validity is relationship to other variables. The more familiar concepts of convergent, discriminative, criterion-related and predictive validities fall into this category of evidence (Lenz & Wester, 2017). This category also includes consideration of test generalisability to other samples, and other scenarios (AERA, APA, & NCME, 2014; Lenz & Wester, 2017). Finally, evidence regarding consequences of testing relates to the possibility of erroneous conclusions or unexpected consequences arising from the interpretation test scores. Test designers will typically postulate an interpretation for the score ranges achieved, and a recommendation for action or decision may follow this interpretation. However, failure to examine the validity of claims made may result in unintended or detrimental consequences to individual and societal wellbeing, through use of the test (AERA, APA, & NCME, 2014; Downing, 2003).

Determination of validity is an ongoing process requiring multiple studies and the accumulation of numerous sources of evidence (Flake, Pek, & Hehman, 2017; Nordness, Epstein, Cullinan, & Pierce, 2014). Depending on the intention of the test, some types of evidence for validity may be more relevant or applicable than others (AERA, APA, & NCME, 2014). In the present research, validity evidence collected to support interpretations of participant data from the P-VS was based on test content, internal structure, and relationship to other variables.
Validity Evidence Through Test Content

A range of processes were undertaken to ensure that the test content was representative of the pain-validation construct. These processes are described in Chapter 4 and thus, will not be detailed again here. To summarize, however, facets of test content validity evidence in this study include: establishing a clear definition and dimensional scope of the construct being measured, utilising feedback from subject matter experts to ensure construct relevance of the items and the likely relevance of items to all members of the target population, and utilising feedback from a small sample of the general public to ensure item meanings were clear and unambiguous (AERA, APA, & NCME, 2014; Lenz & Wester, 2017).

Validity Evidence Through Internal Structure

Evidence for validity based on internal structure of the P-VS was demonstrated in Chapters 4 and 5, detailing factor structure analysis of the measure. Through this factor analysis, the dimensionality of the measure was examined. Dimensionality becomes relevant when deciding whether the subscales should be scored and considered separately, or whether subscale scores can be combined to produce an overall, composite score (Lenz & Wester, 2017). Structural equation modelling was used to confirm that a 4-factor model best captured the construct of interest and indicated that separate evaluation of subscales may be most suitable, given the weak to moderate correlations between them (Table 5.4). Soundness of internal structure for the P-VS was also demonstrated with goodness-of-fit indicators showing acceptable values (Table 5.3).
Another aspect of validity evidence related to internal structure is the reliability of the measure. Reliability refers to the degree to which a test consistently produces the same results, with any change in the score indicating a change in the variable of interest, rather than change due to error variance (DeVellis, 2017). A test with high reliability is of benefit to the researcher because it produces less error (than a test with lower reliability), thereby increasing statistical power (DeVellis, 2017). There are several forms of reliability including: inter-rater reliability (for test scoring that relies on researcher observation), parallel forms (alternate versions of a test designed to measure the same construct), internal consistency, and test-retest reliability (Trochim et al., 2016). In the present research, internal consistency and test-retest reliability were deemed most appropriate for examination.

**Internal consistency reliability.** Reliability can be increased by including more items or improving the quality of items in a test (DeVellis, 2017). The potential for fatigue and limitations to concentration, as often experienced by those with chronic pain, was a chief consideration in developing the P-VS. As such, ensuring the quality of scale items was preferable to including additional items to bolster reliability. One quality of items in a scale, or subscale, is their comparative representativeness of the same construct – or internal consistency. Internal consistency can be applied to an instrument as a whole, or to any subdivision of the measure, and is described as the degree to which items ‘hang together’ (Cicchetti, 1994, p. 285). Cronbach’s alpha is a commonly reported statistic to denote internal consistency. Cronbach’s alpha, in broad terms, is the average correlation coefficient achieved from every possible way that the set of items can be split in half (Field, 2013). Following the survey distribution for
CFA, described in Chapter 5, participant data ($N = 308$) was analyzed and Cronbach’s alpha was determined for each of the subscales individually, as recommended by Cronbach (1951). Table 6.1 shows that each of the three pain-invalidation subscales achieved alpha values of greater than .90. ‘Over-validation’ subscale reliability was also high at $\alpha = .88$, and similarly high in the re-test sample. Widely accepted in the field of psychometrics are the guidelines regarding alpha reliability values proposed by Nunnally (1978), which offer the following recommendations: .7 as appropriate for preliminary research; .8 as suitable for basic research; and $\geq .9$ being suitable for clinical application.

**Test-retest reliability.** The consistency of test scores produced by the same individual tested across consecutive periods of time is known as test-retest reliability. Ideally, where no change has occurred in the variable being measured, an individual’s responses on the first administration ($T_1$) of a test will match the responses achieved in the second administration ($T_2$). In reality, however, it is possible for actual change in the measured variable to occur between $T_1$ and $T_2$, even without deliberate intervention (Polit, 2014), though this is an indicator of instability in the test variable, not the (un)reliability of the test per se (DeVellis, 2017). Decreasing the time interval between the test and retest may reduce the occurrence of real change in the variable between $T_1$ and $T_2$, thereby strengthening the test-retest reliability coefficient (Heise, 1969). Lamentably, shorter test-retest intervals may introduce other sources of error such as rehearsal effects, with an individual’s memory of their previous responses influencing responses on the second attempt (Ingram & Ternes, 2018; Polit, 2014). Additional sources of error that are not due to test reliability, and yet can impact on the reliability coefficient,
Table 6.1. Reliabilities for each subscale indicated by internal consistency, and test-retest correlations at Time 1 (T₁), and 4 weeks later at Time 2 (T₂).

<table>
<thead>
<tr>
<th>Subscale</th>
<th>Internal Consistencies</th>
<th>Test-Retest correlation ≤ p .01</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Cronbach's alpha</td>
<td>r T₁-T₂</td>
</tr>
<tr>
<td></td>
<td>Time 1 (N = 308)</td>
<td>Time 2 (N = 80)</td>
</tr>
<tr>
<td>Invalidation by the Self</td>
<td>.91</td>
<td>.91</td>
</tr>
<tr>
<td>Invalidation by Immediate Others</td>
<td>.92</td>
<td>.91</td>
</tr>
<tr>
<td>Invalidation by Healthcare Professionals</td>
<td>.93</td>
<td>.93</td>
</tr>
<tr>
<td>Over-validation</td>
<td>.88</td>
<td>.87</td>
</tr>
</tbody>
</table>

Note. *Correlations are significant at the level of p ≤ .01.

may result from environmental or circumstantial differences between T₁ and T₂ such as time of day, participant mood and motivation levels, or mode of assessment (DeVellis, 2017). Facets of the test itself that may contribute to reliability error include the number and wording of response categories – with too many categories or ambiguously labelled anchors on the response scale potentially resulting in inconsistent responses across repeated test administrations (Alwin & Krosnick, 1991; Weng, 2004).

To determine test-retest reliability, the CFA survey distribution was followed up one month later with another distribution of the same survey via the Prolific online platform, to a sample of 80 participants. The ‘whitelist’ feature in Prolific enabled a selection criterion such that only individuals who had taken part in the CFA distribution were invited to participate in the retest survey. Attempts to control measurement error were made by administering the retest
survey via the same online platform, and at the same time of day as the T₁ survey administration. To counter any potential bias in responses related to participant memory effects, or strivings for consistency (Ingram & Ternes, 2018; Polit, 2014), administration of the test and retest was spaced 4 weeks apart.

Benchmark values for test-retest reliability are notoriously scarce in the literature, possibly because appraisal of reliability depends on a number of factors such as the population being tested, the test-retest interval, and the stability of the construct (Ingram & Ternes, 2018). As a basic guideline, however, test-retest reliability scores ranging between .7 to .9 are typically reported as acceptable (Ingram & Ternes, 2018), and values of .7 or lower have also been deemed acceptable by some healthcare researchers (Polit, 2014). Table 6.1 shows the Pearson’s product moment correlations between T₁ and T₂ for the 80 participants involved in both test administrations. All subscales showed acceptable test-retest reliability with coefficients approximating $r = .7$ or higher. The lowest correlation coefficient, $r = .69$, was found for the ‘Invalidation by Healthcare Professionals’ subscale. This result may be due to participants having different experiences with their healthcare professional between T₁ and T₂. It is interesting to note the close range of test-retest correlations amongst the 3 subscales relating to external parties, compared to the substantially higher test-retest correlation observed for the subscale related to the self. This indicates that the measurement of participant feelings toward the self with regards to pain-invalidation is more reliable than that of participant perceptions of pain-invalidation by others. Logic suggests that this result is to be expected given that perceptions of pain-invalidation by others may depend on experiences and communications (or lack thereof) with others – which can vary across time.
Validity Evidence Through Relationships with Other Constructs

Another source of evidence for the validity of conclusions made based on results of the Pain-Validation Scale relates to the relationship between pain-validation and other constructs. Given the scarcity of research operationalizing the construct of pain-validation, currently there is no gold standard criterion measure for comparison with the P-VS\(^1\). Therefore, convergent validity was examined using a range of instruments designed to measure constructs that are, theoretically, related to the P-VS subscale domains. Constructs comparable to the dimensions of pain-validation, and related psychometric measures, are discussed as follows.

**Self-compassion.** The beneficial outcomes of positive attitudes and beliefs regarding chronic pain have been explored in recent decades (Finan & Garland, 2015; Park & Sonty, 2010; Zautra, Johnson, & Davis, 2005). Compassion refers to a state of both recognizing and being emotionally moved by suffering (of the self or another), together with the desire to alleviate it (Strauss et al., 2016). Directing compassion inward, self-compassion is defined as a conscious awareness of one’s own suffering, maintaining a non-judgemental attitude of warmth and kindness toward the self in difficult times, and having an understanding of these experiences as shared by humankind (Neff, 2003). A

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\(^1\) Though the Illness Invalidation Inventory (3*I; Kool et al., 2010) is designed to measure levels of patient invalidation, its inclusion as a convergent measure was not feasible due to difficulties establishing communications to obtain permission for its use in the current research.
compassionate approach toward the self is associated with enhanced physical and psychological well-being (Hall, Row, Wuensch, & Godley, 2013). In contrast, studies have shown the clinical relevance of self-compassion for those with somatoform disorders, with lower levels of self-compassion relating to a higher number of physical symptoms, and poorer quality of life (Dewsaran-van der Ven et al., 2018).

The Self-Compassion Scale-Short Form (SCS-SF; Raes, Pommier, Neff, & Van Gucht, 2011) is a shortened version of the original 26-item Self-Compassion Scale (SCS; Neff, 2003). Consisting of 12 items, the SCS-SF contains items related to the six components of self-compassion measured in the full scale, including: Self-kindness, Self-judgment, Common humanity, Isolation, Mindfulness, and Over-identification. The SCS-SF requires that all 12 items be summed to create an overall score. Respondents are asked to answer each item based on how they act toward themselves during difficult times, using a Likert-type scale ranging from 1 = ‘Almost Never’, to 5 = ‘Almost Always’. Example items from the SCS-SF include, “When I am going through a very hard time, I give myself the caring and tenderness I need” and “When something painful happens I try to take a balanced view of the situation” (Raes et al., 2011, p. 255). High correlations have been reported between the short and long version of the SCS, at $r = .98$ (Raes et al., 2011), and $r = .92$ (Garcia-Campayo et al., 2014). High internal consistency for the measure has also been reported at $\alpha = .87$ (Raes et al., 2011), and $\alpha = .85$ (Hayes, Lockard, Janis, & Locke, 2016; Kelly, Carter, Zuroff, & Borairi, 2013).
People who view their ongoing pain as a personal fault demonstrate negative judgement toward their own suffering. Rather than considering their pain as a natural result of injury or stresses imposed on the self, those with invalidating attitudes toward their pain may show little in the way of self-compassion and self-kindness. As such, a negative relationship between the SCS-SF scores and the ‘Invalidation by the Self’ subscale scores of the P-VS, was predicted.

**Perfectionism.** Attracting increasing attention by researchers is the personality trait of perfectionism in relation to chronic pain (Gonzalez, Baptista, & Branco, 2015; Randall et al., 2018). Perfectionism has been examined via several approaches aiming to measure varied dimensions of the construct (Crosby, Bates, & Twohig, 2011). Broadly, however, perfectionism is described as striving to meet excessively high expectations, and is often associated with critical self-evaluation upon failure to meet high standards (Crosby et al., 2011; Hewitt & Flett, 1991). Certain dimensions of perfectionism, such as socially-prescribed perfectionism, are associated with poorer health-related quality of life (Harrison & Craddock, 2016). Studies have also linked perfectionistic concern to lower self-rated health (Sirois & Molnar, 2017). In addition, perfectionists have a greater need for control (Molnar, Sirois, & Methot-Jones, 2016). Thus, perfectionistic individuals may undergo additional stress and poorer coping with perceptions of low situational control in the case of having a chronic health condition (Molnar et al., 2016).

There are a number of psychometric tools designed to measure perfectionism. Scales differ, however, in terms of the unique facets of the construct tapped by each instrument. The Almost Perfect Scale-Revised (APS-R;
Slaney, Rice, Mobley, Trippi, & Ashby, 2001) was preferable for this study as a measure less concerned with flawlessness, but rather, more focused concepts relevant to the P-VS, such as a sense of expectations and not feeling good enough. The APS-R is a 23-item instrument assessing adaptive and maladaptive types of perfectionism across three factors. Adaptive perfectionism is measured by 12 subscale items representing an individual’s ‘High Standards,’ and 4 subscale items representing a tendency for ‘Order’. Maladaptive perfectionism is gauged by 7 items representing ‘Discrepancy’, a subscale measuring the individual’s perceived failure to meet their high standards (Slaney et al., 2001). An example item for ‘High Standards’ subscale is “I have high expectations for myself”; an example for the ‘Order’ subscale is, “I am an orderly person”, and the Discrepancy subscale is exemplified by the item, “I hardly ever feel that what I have done is good enough” (Slaney et al., 2001, p. 139). Responses are given using a 7-point Likert-type scale ranging from 1 = ‘Strongly disagree’ to 7 = Strongly agree’. The APS-R subscales feature high internal consistencies, with $\alpha = 85$ for High Standards, $\alpha = .82$ for Order, and $\alpha = .91$ for the Discrepancy subscale (Slaney et al., 2001). Further studies have validated the findings of high Cronbach’s alpha for the 3 subscales (Grzegorek, Slaney, Franze, & Rice, 2004; Hayes et al., 2016).

For perfectionistic individuals, the limitations imposed by a chronic pain condition may prevent them from achieving self-imposed expectations. The resulting failures may not be tolerated forgivingly, with the resulting critical judgement reflected in the tendency to invalidate the self with regards their pain. A positive correlation between scores on the APS-R and scores on the ‘Invalidation by the Self’ subscale of the P-VS was, therefore, hypothesized.
Fear of negative evaluation. The concept of socially prescribed perfectionism is similar to a fear of negative evaluation, in that both are underpinned by a desire to avoid negative social judgement. Concern about being judged negatively by others can be measured by the Brief Fear of Negative Evaluation scale (BFNE; Leary, 1983). The BFNE is a 12-item instrument answered on a 5-point Likert-type scale ranging from 1 = ‘not at all characteristic of me’ to 5 = ‘extremely characteristic of me’. An example item from the BFNE is, “When I am talking to someone, I worry about what they may be thinking about me” (Leary, 1983, p. 373). High internal consistencies have been reported $\alpha = .90$ (Leary, 1983), $\alpha = .90$ (Kocovski & Endler, 2000), and $\alpha = .80$ (Duke, Krishnan, Faith, & Storch, 2006). Good reliability of $\alpha = .75$ was also demonstrated after a 4-week test-retest interval (Leary, 1983).

Pain-invalidation may be interpreted as others deeming the pain ‘unacceptable’. Furthermore, it is possible that an individual’s perceptions of pain-invalidation by others is influenced by a sensitivity to, or fear of, negative evaluation. It was, thus, predicted that scores on the BFNE would correlate positively with the ‘Invalidation by Immediate Others’ subscale scores, and the ‘Invalidation by Healthcare Professionals’ subscale scores on the P-VS.

Illness cognitions. When experiencing a long-term illness or pain condition, the individual develops their own beliefs, attitudes and coping mechanisms which may become incorporated into their identity (Berk et al., 2013). Living with chronic pain imposes limitations, as a result of which, allowances and exemptions are made to accommodate the individual in the ‘sick role’, a term coined by Parsons (1951). Perceptions of low social support may also heighten the
individual’s anxieties about moving out of the sick role (Berk et al., 2013). For the individual to be perceived as credible in their complaint of chronic pain, looking too well can work against the patient. Studies have identified that pain behaviours serve a function in providing evidence of a pain condition and justifying continued illness status (Sullivan, et al., 2006). Pain behaviours are defined as postures adopted or actions performed by those experiencing pain (Sullivan et al., 2006). Pain behaviours can be communicative in that they signal distress to others who may be able to provide assistance or comfort, for example, facial grimacing, sighing, or verbal expression of pain (Thibault, Loisel, Durand, Catchlove, & Sullivan, 2008). The other main type is protective pain behaviour, designed to protect the body from further exacerbating the condition or its symptoms, exemplified by guarding, limping, or rubbing the affected area (Thibault et al., 2008).

The Illness Cognitions Scale (ICS; Berk et al., 2012) was constructed to help identify individuals who may find it difficult to move out of the sick role and into wellness (Berk et al., 2012). It was developed using a sample of individuals with bipolar or schizoaffective disorder. The ICS is a 17-item measure of one general factor: investment in the sick role. An example item from the ICS is, “I cannot imagine being well” (Berk et al., 2012, p. 363). Participants respond on a 5-point Likert-type scale ranging from 1 = ‘Strongly disagree’ to 5 = ‘Strongly agree’. Good internal consistency for the measure was reported with Cronbach’s $\alpha = .86$ (Berk et al., 2012).

Invalidation of chronic pain by personal or professional others indicates unacceptability of pain complaints and a refusal to sanction the individuals pain
status. Thus, several items on the ICS may be relevant correlates as they reflect a desire for the individual to have their illness validated by others. Further studies by Berk et al. (2013) found that scores on the ICS correlated negatively with perceived social support. Social validation of one’s pain condition may therefore be sought, in particular, for those scoring highly on the ICS. As such, it was considered that the scores on the ICS would likely correlate positively with those on the ‘Invalidation by Immediate Others’ subscale, and those on the ‘Invalidation by Healthcare Professionals’ subscale of the P-VS.

Pain catastrophizing. Pain- catastrophization is identified by rumination on the pain experience, magnification of the associated negativity of pain, and helplessness regarding the pain (Sullivan et al., 2001). Individuals with chronic pain experience sustained anticipation of pain (Smith, Herman, & Smith, 2015). This acts to compound the issue given that pain thresholds decrease with heightened pain anticipation (Schrooten, Karsdorp, & Vlaeyen, 2013). Those who avoid activity due to fear of exacerbating their pain (or causing further damage) may be disinclined to pursue daily tasks upon sensing pain (Smith et al., 2015; Vlaeyen & Linton, 2000). Pain catastrophizing may, therefore, interfere with general efficacy and daily activities due to the tendency for individuals to limit activity or progress toward goals upon sensing pain (Smith et al., 2015). Further, a central premise of the communal coping model is that individuals may communicate their distress through pain behaviours and catastrophizing, to gain social support (Sullivan, 2012). Studies designed to extend the communal coping model have also tested the relationship between pain catastrophizing and perceived partner support (Cano, Leong, Heller, & Lutz, 2009). Higher pain
catastrophization was found for individuals with higher perceived entitlement to pain-related support (Cano et al., 2009).

The Pain Catastrophizing Scale (PCS; Sullivan, Bishop, & Pivik, 1995) is a 13-item measure that examines the tendency for individuals to form exaggerated, negative pain cognitions, and an inclination to appraise their pain as enduring. The 5-point Likert-type response scale ranges from 0 = ‘not at all’, to 4 = ‘all the time’. High internal consistency was reported for the scale overall at Cronbach’s $\alpha = .87$ (Sullivan et al., 1995). Further studies supported findings of high internal consistency for the full PCS with Cronbach’s $\alpha = .95$ and a second sample with $\alpha = .92$ (Osman et al., 2000). Good test-retest reliability was reported at $r = .75$ after a 6-week interval (Sullivan et al., 1995).

The PCS was selected to test convergent validity of the P-VS, in particular because of the theoretical relationship between ‘Over-validation’ subscale items and the PCS items. For example, the PCS item “I become afraid that the pain will get worse” (Sullivan et al., 1995, p. 526) indicates a potential fear of doing anything to exacerbate the pain. Such attitudes may be either a result of, or reflected in, the attitudes of immediate others who may over-attend to the individual’s needs, or take over daily tasks in order to prevent pain aggravation. A positive correlation between the PCS scores and the ‘Over-validation’ subscale scores of the P-VS, was thus considered probable.

**Self-efficacy.** Self-efficacy refers to the individual’s belief that they hold the necessary capabilities to attain a desired outcome (Bandura, 1978). The experience of pain may lead to fear-related avoidance of activities and, over time, repeated failure to accomplish tasks may lead to a decreased sense of self-efficacy.
A meta-analysis has shown that for those with chronic pain, higher self-efficacy is associated with higher functional capability, lower affective distress, and lower pain intensity (Jackson, Wang, Wang, & Fan, 2014). This may be due, in part, to the tendency for individuals with high self-efficacy to engage in more adaptive coping strategies such as positive self-talk, rehabilitative activity, and task persistence in the presence of pain (Turner, Ersek & Kemp, 2005).

The Pain Self-Efficacy Questionnaire (PSEQ; Nicholas, 2007) is a 10-item self-report measure of an individual’s self-efficacy beliefs regarding their pain. An example item from the PSEQ is “I can live a normal lifestyle, despite the pain” (Nicholas, 2007, p. 161). Respondents answer questions on a 7-point Likert-type scale from 0 = ‘Not at all Confident’ to 6 = ‘Completely confident’. The measure shows high internal consistency, with the original study reporting Cronbach’s $\alpha = .92$, and a test-retest reliability coefficient of $r = 0.73$ after a 3-month interval (Nicholas, 2007). The measure has been translated into several other languages with high internal consistency outcomes reported for Chinese ($\alpha = .93$; Lim et al., 2007), Brazilian ($\alpha = .90$; Sardá, Nicholas, Pimenta, & Asghari, 2007), and Japanese versions ($\alpha = .94$; Adachi et al., 2014).

Well-meaning members of the social community may attempt to make life easier for the individual in pain by taking on many of the individual’s daily tasks. Over-attendance to the individual in this way may interfere with rehabilitative efforts and lower the functional capability of pain patients, limiting their self-efficacy (Romano, Jensen, Turner, Good, & Hops, 2000; Sullivan, 2012). It was
predicted, therefore, that a negative relationship would be found between scores on the PSEQ and scores on the Over-validation subscale of the P-VS.

In light of the relationships described between pain-validation and related constructs, the following outcomes regarding convergent measures, were hypothesized.

1. Participant scores on the P-VS ‘Invalidation by the Self’ subscale will (a) correlate negatively with scores on the SCS-SF, and (b) correlate positively with scores on the APS-R. 
2. Participant scores on the P-VS ‘Invalidation by Immediate Others’ subscale will (a) correlate positively with scores on the BFNE, and (b) correlate positively with scores on the ICS.
3. Participant scores on the P-VS ‘Invalidation by Healthcare Professionals’ subscale will (a) correlate positively with scores on the BFNE, and (b) correlate positively with scores on the ICS.
4. Participant scores on the P-VS ‘Over-validation’ subscale will (a) correlate positively with scores on the PCS, and (b) correlate negatively with scores on the PSEQ.

**Data Collection**

To test for convergent relationships between the P-VS subscales and comparative measures, participants \((N = 308)\) who completed the CFA survey of pain-validation items through Prolific (as described in Chapter 5) were also issued the SCS-SF, BFNE, PCS, and PSEQ. It was also desirable to collect data on the perfectionistic tendencies of those with chronic pain. However, it was important to recognize that chronic pain can fatigue individuals and limit the capacity for
cognitive attention (Moriarty, McGuire, & Finn, 2011; Oosterman, Derksen, van Wijck, Veldhuijzen, & Kessels, 2011). Therefore, the survey was issued in 2 parts, with the option for participants (having completed the P-VS, SCS-SF, BFNE, PCS, and PSEQ) to complete Part 2, offered after the completion of Part 1. Part 2 of the survey contained construct measures deemed to be potentially related to the construct of pain-validation, including the APS-R and ICS. Over 95% of the 308 participants who completed Part 1 of the survey, also completed Part 2 (n = 294).

**Data Preparation and Assumption Checking**

Examination of the box and whisker plots in SPSS revealed 4 outlier scores at the top end of the SCS-SF, 1 outlier at the low end of the APS-R, 3 outliers at the top end of the ICS, and 1 outlier at the low end of the ICS. The total of 9 outlier scores was less than 5% of the data, and thus outlier scores were assigned a new value equal to the closest non-outlier score (Field, 2013). A variety of methods were used to check for normal distributions of variable data. With regards to the four P-VS subscales, visual inspection of the histograms generated in SPSS indicated possible non-normality of data distribution. Skew and kurtosis values were < 1.0, supporting the assumption of normal data distribution (Lei & Lomax 2005). While significant results on the Shapiro-Wilks test indicated that the assumption of normal data distribution had been violated for all four P-VS subscales, this test is known to be overly sensitive to samples of the present size (Ghasemi & Zahediasl, 2012). Nevertheless, both parametric and non-parametric analyses were used to test the correlational hypotheses.
Sample Representativeness

Table 6.2 provides an indication of the present sample’s representativeness, through comparison with sample data reported in previous research regarding individuals with pain. While mean scores for pain self-efficacy, pain catastrophizing, and fear of negative evaluation were within comparable range, Table 6.2 shows a level of discrepancy between the present and comparative sample for self-compassion. Few studies were found on pain populations using the short form version of the SCS. The comparative SCS-SF data is provided from a sample of females only, with chronic musculoskeletal pain, 86% of whom were diagnosed with fibromyalgia. The absence of male representation in the comparative sample may account, to some degree, for the lower self-compassion score, with studies showing that females report lower self-compassion (Yarnell et al., 2015), and higher levels of self-judgement than males (Neff, 2003). The high proportion of patients with fibromyalgia in the comparative sample may also have contributed to inter-sample differences, though further studies may be required to identify specific relationships between self-compassion and pain condition. The SCS-SF development and validation study (Raes et al., 2011) reported that an English speaking sample of students without pain \((n = 415)\) had a mean score of 36.0 \((SD = 7.33)\). This result was more closely aligned with the present sample data, though the healthy individuals showed a higher self-compassion average than those with pain.
Table 6.2. Present and comparative sample score means and standard deviations.

<table>
<thead>
<tr>
<th></th>
<th>Present sample</th>
<th>Comparison sample</th>
<th>Author</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>Mean</td>
<td>SD</td>
</tr>
<tr>
<td>PSEQ</td>
<td>308</td>
<td>37.82</td>
<td>12.74</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PCS</td>
<td>308</td>
<td>23.21</td>
<td>11.55</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SCS-SF</td>
<td>308</td>
<td>33.13</td>
<td>7.78</td>
</tr>
<tr>
<td>BFNE</td>
<td>308</td>
<td>39.24</td>
<td>11.99</td>
</tr>
<tr>
<td>ICS</td>
<td>294</td>
<td>45.26</td>
<td>9.75</td>
</tr>
<tr>
<td>APS-R</td>
<td>294</td>
<td>111.91</td>
<td>19.5</td>
</tr>
</tbody>
</table>

Note. N = 308. PSEQ = Pain Self-Efficacy Questionnaire; PCS = Pain Catastrophizing Scale; SCS-SF = Self-Compassion Scale-Short Form; BFNE = Brief Fear of Negative Evaluation scale; ICS = Illness Cognitions Scale; APS = Almost Perfect Scale-Revised

**Pain Frequency**

The definition of chronic pain varies, with some literature classifying it more broadly as pain lasting (or recurring) for longer than 3 months (Treede et al., 2019). Other studies stipulate a given pain frequency within the definition, specifying individuals as having had pain on most or all days (Pitcher, Von Korff, Bushnell, & Porter, 2019). The present study included adult participants with non-cancerous pain lasting for 3 months or longer. Table 6.3 details pain frequencies for participants within the CFA data sample. Participants with pain on only several days per month constituted approximately 22% of the sample, while 78% had pain most days or constantly. These proportions indicate that pain
frequency may be a relevant variable to investigate as a potential predictor of pain-(in)validation or over-validation.

Table 6.3  Pain frequencies in CFA sample participants.

<table>
<thead>
<tr>
<th>How often do you have pain?</th>
<th>Frequency</th>
<th>% total sample</th>
<th>Cumulative %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constantly, or near constantly</td>
<td>62</td>
<td>20.1</td>
<td>20.1</td>
</tr>
<tr>
<td>Daily episodes of pain</td>
<td>72</td>
<td>23.4</td>
<td>43.5</td>
</tr>
<tr>
<td>Most days of the week</td>
<td>106</td>
<td>34.4</td>
<td>77.9</td>
</tr>
<tr>
<td>Several days per month</td>
<td>68</td>
<td>22.1</td>
<td>100</td>
</tr>
</tbody>
</table>

*Note. N = 308*

**Hypothesis Testing**

**P-VS subscales and related measures.** To test the hypotheses regarding the 4 P-VS subscales and related construct measures (SCS-SF, APS-R, BFNE, ICS, PCS, and PSEQ), both Spearman’s rank order correlation and Pearson’s product moment bivariate correlations were examined using SPSS (with Pearson’s correlations shown in Table 6.2). While there were slight differences in the Spearman’s and Pearson’s correlational values, the following outcomes reported were the same using either statistical test. Hypotheses 1(a) and (b) were supported with a significant negative correlation found between *Invalidation by the Self* and the SCS-SF, and a significant positive correlation found between *Invalidation by the Self* and the APS-R. Hypothesis 2(a) was supported with a significant correlation found between *Invalidation by Immediate Others* and the ICS; while hypothesis 2(b) was not supported, as no significant relationship was found between *Invalidation by Immediate Others* and the BFNE. In support of hypothesis 3 (a) and (b), both the ICS and the BFNE had significant positive
correlations with *Invalidation by Healthcare Professionals*. Results also supported hypothesis 4 (a) and (b), with a significant positive correlation found between the PCS and *Over-validation*, while a negative correlation was found between PSEQ and *Over-validation*.

*Non-hypothesized relationships.* Beyond the hypothesized relationships, several additional significant correlations were noted between some variables. Interestingly, the ‘Invalidation by the Self’ subscale correlated significantly with all of the related constructs tested. The ‘Invalidation by the Self’ subscale had the strongest negative correlation with the PSEQ, and all remaining measures correlated positively with the subscale (other than the negative correlation previously noted with the SCS-SF in support of hypothesis 1). The ‘Invalidation by Immediate Others’ subscale had significant positive relationships with the PCS and the APS-R, and a significant negative relationship with the SCS-SF. The ‘Invalidation by Healthcare Professionals’ subscale also correlated significantly with all of the measures tested. Both the SCS-SF and the PSEQ correlated negatively with *Invalidation by Healthcare Professionals*; while the subscale was found to have positive relationships with the PCS and the APS-R. Finally, the ‘Over-validation’ subscale demonstrated a significant, positive correlation with both the ICS and the APS-R. These additional relationships were unsurprising given that significant correlations were found between all the instruments tested for comparison with the P-VS, as seen in Table 6.4. This abundance of significant relationships may result from the instruments’ similarities in terms of capturing an individual’s affective tendencies, cognitive styles or personality traits, particularly in relation to a sample of people with chronic pain.
Table 6.4. Pearson’s correlations between the pain-validation subscales and related constructs.

<table>
<thead>
<tr>
<th></th>
<th>Invalidation by the Self</th>
<th>Invalidation by Imm. Others</th>
<th>Invalidation by HCP</th>
<th>Over-validation</th>
<th>BFNE</th>
<th>SCS-SF</th>
<th>PSEQ</th>
<th>PCS</th>
<th>APS-R</th>
<th>ICS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Imm. Others</td>
<td>.28**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HCP</td>
<td>.24**</td>
<td>.37**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Over</td>
<td>.29**</td>
<td>.23**</td>
<td>.19**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BFNE</td>
<td>.30**</td>
<td>.10</td>
<td>.18**</td>
<td>-.06</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SCS-SF</td>
<td>-.22**</td>
<td>-.20**</td>
<td>-.26**</td>
<td>.02</td>
<td>-.58*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PSEQ</td>
<td>-.56**</td>
<td>-.11</td>
<td>-.16**</td>
<td>-.21**</td>
<td>-.15**</td>
<td>-.26**</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PCS</td>
<td>.45**</td>
<td>.18**</td>
<td>.16**</td>
<td>.23**</td>
<td>.27**</td>
<td>-.30**</td>
<td>-.49**</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>APS-R</td>
<td>.41**</td>
<td>.24**</td>
<td>.18**</td>
<td>.13*</td>
<td>.36**</td>
<td>-.42**</td>
<td>-.21**</td>
<td>.40**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ICS</td>
<td>.29**</td>
<td>.34**</td>
<td>.24**</td>
<td>.31**</td>
<td>.26**</td>
<td>-.32**</td>
<td>-.34**</td>
<td>.39**</td>
<td>.32**</td>
<td></td>
</tr>
</tbody>
</table>

*Note.* **Significant at the .01 level. *Significant at the .05 level. N = 308 for all variables, with the exception of APS-R and ICS where N = 294. SCS-SF = Self-Compassion Scale-Short Form; BFNE = Brief Fear of Negative Evaluation scale; APS-R = Almost Perfect Scale-Revised; PCS = Pain Catastrophizing Scale; ICS = Illness Cognition Scale; PSEQ = Pain Self-Efficacy Questionnaire.
In addition, an independent samples \( t \)-test was performed to further specify any mean gender\(^2 \) differences existing between males (\( n = 122 \)) and females (\( n = 184 \)), on each of the P-VS subscales. A significant Levene’s test statistic suggested violation of the assumption of equal variances between genders on the ‘Invalidation by Healthcare Professionals’ subscale. Levene’s test indicated that the assumption of equal variances between the genders held for all remaining subscales. The relevant \( t \)-tests revealed significantly lower levels of *Pain-Invalidation by the Self* for males than for females, \( t(304) = -3.17, p = .002 \). No significant gender differences were found for the ‘Invalidation by Immediate Others’ subscale, \( t(304) = .50, p = .620 \), or for the ‘Invalidation by Healthcare Professionals’ subscale, \( t(286.67) = -1.84, p = .066 \). However, males scored significantly higher on the ‘Over-validation’ subscale than females, \( t(304) = 2.13, p = .034 \). The mean subscale scores for males and females are shown in Table 6.5.

\(^2\) A third gender category of ‘Other’ was offered in the survey. However, as only two participants identified as ‘Other’ gendered, the category was too small to provide statistically meaningful outcomes. Thus, from the sample total of \( N = 308 \), only 306 participants, either males or females, were included in the gender analysis.
Table 6.5. Gender score descriptives for each of the pain-validation subscales.

<table>
<thead>
<tr>
<th>Subscale</th>
<th>Males</th>
<th>Standard Deviation</th>
<th>Minimum, Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Invalidation by the Self</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>25.69</td>
<td>9.13</td>
<td>6, 41</td>
</tr>
<tr>
<td>Female</td>
<td>29.00</td>
<td>8.84</td>
<td>6, 42</td>
</tr>
<tr>
<td>Invalidation by Immediate Others</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>18.38</td>
<td>8.60</td>
<td>6, 40</td>
</tr>
<tr>
<td>Female</td>
<td>17.87</td>
<td>9.08</td>
<td>6, 42</td>
</tr>
<tr>
<td>Invalidation by HCP</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>15.45</td>
<td>7.55</td>
<td>6, 42</td>
</tr>
<tr>
<td>Female</td>
<td>17.20</td>
<td>8.93</td>
<td>6, 41</td>
</tr>
<tr>
<td>Over-validation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>18.26</td>
<td>6.58</td>
<td>6, 36</td>
</tr>
<tr>
<td>Female</td>
<td>16.47</td>
<td>7.62</td>
<td>6, 37</td>
</tr>
</tbody>
</table>

*Note. Males n = 122, Females n = 184*

**Regression Analyses**

To better understand the predictive relationships between the P-VS and related measures, multiple regression analyses were performed. Prior to conducting such analyses, however, certain assumptions regarding the data were explored (Ernst & Albers, 2017; Williams, Grajales, & Kurkiewicz, 2013).

Firstly, normal distribution of the residuals in the regression model was established through inspection of the normal P-P plots in SPSS. Secondly, scatterplots comparing standardized residuals and predictor values for the variables indicated that the assumptions of linearity and of homoscedasticity were met. Finally, examination of the correlation matrix affirmed that there was no multicollinearity with all correlations between the model variables being less than $r = .85$ (Allen & Bennett, 2012). In all cases, analyses were based on a sample size of $n = 294$ individuals with chronic pain (i.e. the participants who completed both Part 1 and Part 2 of the CFA survey).
Within the regression analyses it was deemed prudent to investigate possible contributions of additional covariates to outcomes of the P-VS. Research suggests, for instance, that there may be differences between males and females in terms of pain perception (Sorge & Strath, 2018), clinical pain assessment, and prescription of pain relief medications (Hirsh, George, & Robinson, 2009). Biological, anatomical, cultural, and social factors may play a role in the finding that women report pain more readily or intensely than men, and experience lower thresholds for pain compared to men (Gutiérrez Lombana & Gutiérrez Vidál, 2012). Age-related differences in pain perception have also been noted, with research showing that exhibitionistic displays of pain decrease with age (Panek, Skowronski, & Wagner, 2000). Studies have also revealed age-related disparities with regard to pain assessment, with older adults’ pain potentially being under identified (Hirsh et al., 2009). It was also considered that frequency of pain may play a role in determining P-VS outcomes. Answers to the question, “How often do you have pain?” were recoded to dichotomous categories to distinguish between those experiencing pain several days of the month only, and those experiencing pain more frequently.

The main purpose of regression analysis was to determine which related constructs were significant contributors to variability in pain-validation scores. However, given the potential contributions to variance by the additional independent variables of Gender, Age, and Pain Frequency, 3-step hierarchical linear regression analyses were performed on the four pain-validation subscales. In each case, Gender and Age were entered at Step 1, then Pain Frequency was entered at Step 2 to determine its potential relationship with scores on the pain-validation subscales over-and-above any association with demographic variables.
At Step 3, responses on the SCS-SF, BFNE, APS-R, PCS, ICS, and the PSEQ were entered into the analysis to determine the proportion of variance in each dependent variable, associated with related constructs, after accounting for the contributions of Gender, Age, and Pain Frequency. The resultant outcomes are shown in Table 6.6.

‘Invalidation by the Self’ subscale

Gender and Age collectively accounted for 4.2% of the variability in Invalidation by the Self, $R^2 = .042, p = .002$. After Pain Frequency was entered into the model, the independent variables collectively explained 16.4%. $R^2 = .164$, $\Delta F(1, 290) = 42.24, p < .001$. The addition of related constructs brought the total of variance explained in Invalidation by the Self to 49.8%. $R^2 = .498, p = < .001$. Independent variables Gender, Age, Pain Frequency, and all related constructs, with the exception of Illness Cognitions, were found to make significant independent contributions to variance in Invalidation by the Self.

‘Invalidation by Immediate Others’ subscale

Gender and Age collectively accounted for only 0.2% of the variance Invalidation by Immediate Others, $R^2 = .002, p = .754$. The addition of Pain Frequency into the model increased the variance explained to a total of 4.2%. $R^2 = .042, p = .001$. With the addition of related constructs in Step 3, the independent variables collectively accounted for 16.9% of the variance in Invalidation by Immediate Others, $R^2 = .169, p = < .001$. In the final model, Pain Frequency was a significant contributor to the variance of Invalidation by Immediate Others. Of all the related constructs, only Self-compassion and Illness Cognitions were found
### Table 6.6. Hierarchical linear regression models showing squared correlation change ($\Delta R^2$) values, standardized beta weights, and $t$ values of each predictor variable for the four pain-validation subscales.

| Independent variables | Invalidation by the Self | | | Invalidation by Immediate Others | | | Invalidation by Healthcare Professionals | | | Over-validation | | |
|-----------------------|--------------------------|-----------------|-----------------|--------------------------|-----------------|--------------------------|-----------------|--------------------------|-----------------|-----------------|
|                       | $\Delta R^2$ | Beta | $t$ | $\Delta R^2$ | Beta | $t$ | $\Delta R^2$ | Beta | $t$ | $\Delta R^2$ | Beta | $t$ |
| Model 1               | .042** | .002 | .014 | .035** | -.120 | -2.087* | .140 | 2.427* |
| Gender                | .169 | .042 | -.074 | .099 | 1.701 | .120 | -2.087* |
| Age                   | .121 | .118 | -1.080 | .140 | 2.427* |
| Pain Frequency        | .352 | 6.500** | .210 | 3.648** | .204 | 3.589** |
| Model 2               | .122** | .040** | .043** | .041** | -.116 | -2.055* | .114 | 2.008* |
| Gender                | .176 | 3.276** | -.039 | -.682 | .103 | 1.811 | -.116 | -2.055* |
| Age                   | .077 | .375 | -1.549 | .114 | 2.008* |
| Pain Frequency        | .352 | 6.500** | .210 | 3.648** | .204 | 3.589** |
| Model 3               | .334** | .127** | .084** | .126** | .091 | -1.647 | .111 | 1.977* |
| Gender                | .087 | .1988* | -.026 | -.458 | .092 | 1.603 | -.091 | -1.647 |
| Age                   | .120 | .2698** | .028 | .485 | -.049 | -.850 | .111 | 1.977* |
| Pain Frequency        | .190 | 4.242** | .122 | 2.113* | .161 | 2.748** | .102 | 1.803 |
| SCS-SF                | .122 | 2.198* | -.168 | -2.347* | -.197 | -2.713** | .128 | 1.822 |
| BFNE                  | .222 | 4.143** | -.082 | -1.181 | .017 | .238 | -.101 | -1.492 |
| APS-R                 | .205 | 4.066** | .094 | 1.454 | -.006 | -.090 | .067 | 1.050 |
| PCS                   | .136 | 2.539* | .036 | .526 | -.009 | -.135 | .125 | 1.855 |
| ICS                   | .006 | .131 | .267 | 4.221** | .147 | 2.295* | .269 | 4.340** |
| PSEQ                  | -.383 | -7.472** | .071 | 1.083 | -.029 | -.432 | -.072 | -1.117 |

* indicates $p < .05$; ** indicates $p < .01$.

SCS-SF = Self-compassion Scale-Short Form; BFNE = Brief Fear of Negative Evaluation scale; APS-R = Almost Perfect Scale-Revised; PCS = Pain Catastrophizing Scale; ICS = Illness Cognition Scale; PSEQ = Pain Self-efficacy Questionnaire.
to make significant independent contributions to variance in *Invalidation by Immediate Others*.

**‘Invalidation by Healthcare Professionals’ subscale**

In Step 1 of the model, *Gender* and *Age* collectively accounted for 1.4% of the variance in *Invalidation by Healthcare Professionals*, $R^2 = .014$, $p = .128$. When entered into the model at Step 2, *Pain Frequency* was found to increase total variance explained in *Invalidation by Healthcare Professionals* to 5.7%, $R^2 = .057$, $p < .001$. Related constructs collectively accounted for a further 8.4% of variance in *Invalidation by Healthcare Professionals*, bringing the total variance explained to 14.1%, $R^2 = .141$, $p = < .001$. Similarly to *Invalidation by Immediate Others*, in the final model, *Pain Frequency* contributed significantly to the variance in *Invalidation by Healthcare Professionals*, while *Self-compassion* and *Illness Cognitions* were the only two related constructs to make significant independent contributions.

**‘Over-validation’ subscale**

*Gender* and *Age* collectively accounted for 3.5% of the total variance in Over-validation scores, $R^2 = .035$, $p = .006$. The total variance explained increased to 7.6% after *Pain Frequency* was entered into the model at Step 2, $R^2 = .076$, $p < .001$. Finally, the related constructs were entered into the analysis, with the independent variables collectively accounting for 20.1% of variance in *Over-validation*, $R^2 = .201$, $p = < .001$. A closer examination showed that, in contrast to the other 3 subscales, by model 3, the only significant independent contributors to variance in *Over-validation* were *Age* (marginally at $p = .049$) and *Illness Cognitions*. 

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Predictive Validity

The contribution of Age to the variance in each subscale was generally limited. The most substantial influence of Age was toward Invalidation by the Self. The weak, positive correlation between Age and Invalidation by the Self \( (r = .12, p = .022) \) may be explained by the type of statements in this subscale, which are potentially more pertinent to adults at an age of responsibility and family (as opposed to unencumbered younger adults), for example, “I feel like a burden to others because of my pain condition” and “I don't feel like I am contributing enough at home, because of my pain”.

The importance of Pain Frequency as a contributor toward pain-invalidation outcomes was unsurprising. Pain Frequency was categorized dichotomously, distinguishing those with pain several times per month from those with pain more frequently. It can be assumed that people experiencing pain more often than several times per month may be more likely to encounter pain-invalidation issues. Pain Frequency did not, however, contribute significantly to the variance in Overvalidation. This outcome was, again, unremarkable given that the theme of Overvalidation items centres on others facilitating or impeding one’s independence, an issue that may be less reliant on the frequency of pain.

With regards to constructs related to pain-validation, it was interesting to note the impact of Self-compassion and Illness Cognitions as predictor variables. Self-compassion significantly contributed to the variance in all pain-invalidation subscales. Negative correlations were found between self-compassion and Invalidation by the Self, \( r = -.24, p < .001 \); Invalidation by Immediate Others, \( r = -.23, p < .001 \); and Invalidation by Healthcare Professionals \( r = -.28, p < .001 \).
Such findings were consistent with the theoretical underpinnings of self-compassion, which is defined as a mindful awareness of one’s own suffering, treated with a non-judgemental attitude of kindness toward the self (Neff, 2003). Invalidation of one’s own suffering, however, is in contrast to the definition of self-compassion; and thus, the negative correlation observed between the two was expected. The negative relationship observed between Self-compassion and Invalidation by Immediate Others was in accordance with research demonstrating associations of low self-compassion in the presence of critical parenting or dysfunctional family settings (Neff & McGehee, 2010). Furthermore, attitudes around self-compassion appear to be inherited or engendered within the family culture (Neff, 2011). By extension, it is feasible that the negative relationship between self-compassion and Invalidation by Healthcare Professionals may be due, in part, to individuals with lower self-compassion tolerating or even expecting invalidation by healthcare professionals, rather than seeking out a more compassionate healthcare professional (which, in itself, demonstrates an act of self-compassion). Alternatively, since individuals with lower self-compassion have a tendency toward inner-criticism (Neff & McGehee, 2010) and have lower ability to regulate emotions (Germer & Neff, 2015), individuals low in self-compassion may be more sensitive to cues of external invalidation, thereby endorsing survey statements indicating invalidation more strongly.

Illness Cognitions was, notably, the only independent variable with no significant independent contribution toward Invalidation by the Self. While a significant, positive correlation was observed between Illness Cognitions and Invalidation by the Self ($r = .30, p < .001$) amongst the array of variables assessed, Illness Cognitions was comparatively negligible as a predictor of self-
validation. Nonetheless, it was found to be an important predictor on all other subscales. The ICS contains several items which reflect the individual’s attachment to their illness identity; for example, “I fear returning to my usual roles when well” (Berk et al., 2012, p. 363). This over-identification with one’s illness is aligned with Over-validation, in particular, offering a possible explanation for the predictive value of Illness Cognitions. The predictive potential of the ICS may also be due to several items that refer specifically to the attitudes of others toward the individual’s illness. For example, ICS items such as, “No one takes my illness as seriously as I would like them to take it” (Berk et al., 2012, p. 363) directly reflect perceptions of Invalidation by Immediate Others and Invalidation by Healthcare Professionals in the P-VS.

The predictive ability of the related constructs was of value chiefly in the domain of self-invalidation. However, while independent variables collectively accounted for a reasonable degree of variance (49.8%) in Invalidation by the Self, independent variables only accounted for up to 20% of variance in the remaining P-VS subscales. This outcome was as expected given that, prior to this research, pain-validation has been scarcely defined and operationalized. Comparative measures of pain-validation were unavailable; thus, predictive validity was investigated by comparing against related constructs. As a test of a newly defined construct, the validity of the P-VS measure, therefore, currently relies largely upon evidence through test content and evidence through internal structure (Lenz & Wester, 2017).
Comparing Locally and Globally Sourced Participant Data

To further validate the P-VS, it was deemed beneficial to compare data sourced globally through Prolific to a sample of participants sourced locally within Australia. The Australian sample was collected online with the CFA survey Parts 1 and 2 offered through pain websites Pain Australia and Migraine & Headache Australia. Additional local participants were sourced through the distribution of the survey to patients of Perth-based healthcare practitioners from a pain specialist clinic, a physiotherapy clinic, and a chiropractic clinic. Of the \( N = 103 \) Australian sample, 87.4% were female; while the sample obtained through Prolific \( N = 308 \) had a 59.7% proportion of female participants.

The two data sources were compared to identify possible differences in pain-validation levels for each of the subscales. Prior to analyses, examination of the data showed nonnormal distributions occurring in each data source. Studies show that Analysis of Variance (ANOVA) tests are robust to violations of normality, even with unequal sample sizes (Blanca, Alarcón, Arnau, Bono, & Bendayan, 2017). Nonetheless, for verification, both Multivariate ANOVA (MANOVA) and Mann-Whitney U tests were performed to determine whether similar findings would result using parametric and non-parametric methods.

A one-way between groups MANOVA was conducted to determine whether the source of data, locally versus globally sourced participants (IVs), would show different levels of pain-validation across the 4 P-VS subscales (DVs). Analyses of the dependent variables showed significant differences for the source of data on only the ‘Invalidation by the Self’ subscale, \( F(1,409) = 43.49, p < .001, \) partial \( \eta^2 = .10 \). The level of self-invalidation of pain was found to be significantly higher
in Australian participants ($M = 34.21; SD = 7.26$) than in participants sourced globally via Prolific ($M = 27.66; SD = 9.18$). This finding was corroborated by a Mann-Whitney test indicating that between the data sources, only levels of *Invalidation by the Self* were significantly different, $U = 8916, p = <.001$; with a higher median score of 37 found in Australian participants, than the median score of 29 resulting from Prolific sourced participants.

The difference in self-invalidation scores between the local and global samples may be explained by the higher proportion of female respondents (87.4%) in the local sample, compared to the proportion of female respondents (59.7%) sourced via Prolific. Studies have shown lower levels of self-compassion (Yarnell et al., 2105) and higher levels of self-judgement in women compared to men (Neff, 2003). Women have also indicated higher levels of negative self-talk than men (DeVore & Pritchard, 2013). The specific statements designed to measure *Invalidation by the Self* reflect degrees of negative self-talk, for example, “Sometimes my pain makes me feel useless”, and critical judgement, “I feel like I am letting my partner or close family members down because my pain limits me”. The substantially greater proportion of female respondents in the locally sourced group may, therefore, be a strong contributor to the difference in self-invalidation scores across the two groups.

Males in the sample obtained via Prolific indicated higher levels of over-validation than females (as seen in Appendix F). It is possible that social roles of nurture-style care-taking of family members, being traditionally more female, may equate to higher female attentiveness to their partner. Another possible explanation is the perception of male patients who may be more sensitive to cues
of stifled independence by female partners who may be “… too interfering while they are trying to help me” (from Over-validation subscale item), or expressions of concern by female partners who may “…make too much of a big deal out of it” (from Over-validation subscale item).

**Using the Pain-Validation Scale**

Internal consistency reliabilities of $\alpha = .90$ indicate that the P-VS may be appropriate for use by pain-management therapists or similar professionals. Such professionals may use the P-VS to assess adults with chronic pain, identifying adverse levels of pain-validation, which can be then addressed within the pain-management intervention. The 24-item instrument was designed such that the measure could comfortably and attentively be completed by an individual with chronic pain, in one sitting. All twenty-four test items should be answered by the respondent. Responses for the P-VS are scored as follows: 1 = ‘Strongly Disagree’; 2 = ‘Disagree’; 3 = ‘Slightly Disagree’; 4 = ‘Neutral’; 5 = ‘Slightly Agree’; 6 = ‘Agree’; and 7 = ‘Strongly Agree’. Each of the four subscales contain six items, and for each of the twenty-four items in the P-VS, the possible range of scores is 1 – 7. Thus, the minimum possible score for each subscale is 6, and the maximum possible subscale score is 42.

The first three subscales are designed to measure invalidation of pain. The fourth subscale is designed to measure over-validation of pain. Thus, it is not appropriate to sum the scores of all four subscales together to achieve a total score. Assessment of each subscale separately may be most valuable as an indication of problematic pain-validation levels in specific domains.
were no reverse-scored items in the final instrument, a high score on any pain-invalidation subscale represents a high level of pain-invalidation in the given domain. Similarly for the ‘Over-validation’ subscale, a high score indicates higher degrees of over-validation. Norming studies are yet to be performed on further samples and, as such, information is not available from the present research as to the precise score range that represents a normal or problematic level of pain-validation. However, mean average scores for each subscale, categorized by gender, age, and pain condition, from Study 3 are shown in Appendix F.
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Chapter 6: Instrument Validation


Chapter 7: Discussion

**CHAPTER 7**

**Discussion**

Chronic pain impacts the community at many levels, from its economic burden to the nation, to the financial and practical consequences borne by afflicted individuals and their families. An exploration of the pain literature, however, revealed the deeper social and emotional implications to the lives of those with chronic pain. Pain narratives indicate that there is much more to ‘having pain’ than physical suffering. Conceptualizing chronic pain requires an understanding of the associated factors, the characteristics of pain symptomatology, and the impact of societal reactions to the pain-afflicted individual. Examination of the qualitative literature showed that, for many, the nucleus of pain’s devastation is its disruption to identity (Arroll & Howard, 2013; Asbring, 2001; Crowe et al., 2017; Garthwaite, 2015; Soklaridis, Cartmill, & Cassidy, 2011). While unpleasant, acute pain may require only temporary changes to one’s daily routine until healing allows a return to normal life. Those with an ongoing pain condition must endure this disruption indefinitely, with sufferers often describing themselves as living in a state of limbo between their current and former (pre-pain) selves (Jaye & Fitzgerald, 2011; McGowan, Luker, Creed, & Chew-Graham, 2007), and moving between acceptance and rejection of pain as a part of their lives (Honkasalo, 2001).

Concurrently, an individual transitioning toward acceptance of their new reality may experience grief at the many losses faced as a result of having pain (Asbring, 2001). Such losses are felt across several domains of the self (often simultaneously), including: family relationships (Hudson et al., 2016), friendships
(Arroll & Howard, 2013; Crooks, 2007), work life (Harris, Morley, & Barton, 2003; Silva, Sampaio, Mancini, Luz, & Alcântara, 2011), financial status, hobbies (Asbring, 2001), and personal qualities such as independence, self-esteem, and confidence (Haraldseid, Dysvik, & Furnes, 2012; Soklaridis et al., 2011; Vroman Warner, & Chamberlain, 2009). It is little wonder then, that depression and anxiety are such common experiences for those with chronic pain (Carvalho, Pinto-Gouveia, Gillanders, & Castilho, 2019).

It is possible that bidirectional relationships exist between depression and invalidation. However, some research suggests that self-invalidation may have a stronger causal effect toward depression than the reverse. Subjective social status is thought to be a causal factor of depressive cognitions (Schubert, Süssenbach, Schäfer, & Euteneuer, 2016). The social rank theory of depression posits that depression and submissive behaviour arise as a result of perceiving oneself as having lower social status (Wetherall, Robb, & O’Connor, 2019). Subjective social status may be diminished as a result of chronic pain, particularly through loss of job, identity, and social roles. As recommended by Westphal, Leahy, Pala, and Wupperman (2016), it appears that interventions targeting self-invalidation and self-compassion may be beneficial to reduce depression.

An additional layer to the distress associated with these losses is the cognitive dissonance experienced at the divergence between the individual’s close-held values and the realities of their current daily life with pain (Schmidt, Corcoran, Grahame, & C de C Williams, 2015; Soklaridis et al., 2011). Guilt and shame are lingering psychological negatives that often follow from this ‘ought – actual’ self-discrepancy (Higgins, 1987). A sense of moral failure, burdening
others, and critical self-judgement with regard to an inability to meet self-imposed expectations, were common threads extracted from the narratives. Collectively, these subthemes were identified as self-invalidation of pain.

Frequently, too, were patient reports of encounters with disbelief, stigmatization, and negative judgements from societal others (Birk, 2013; Lavie-Ajayi, Almog, & Krummer-Nevo, 2012; McGowan et al., 2007; Pryma, 2017). The enduring theme throughout such accounts was a need for the individual’s experience of chronic pain to be believed by healthcare professionals and others in their community. Narratives reveal the magnitude of psychological distress suffered by many as a result of these negative occurrences. The potential for detrimental effects of over-validation was also recognized, with limitations to functional rehabilitation being a concern for those with family members who take over daily tasks and activities of the pain patient (Leonard, Cano, & Johansen, 2006; Newton-John, 2013; Romano et al., 1995). Lacking in the literature, to date, has been a construct identifying these concepts, allowing for explicit examination of their effects. Through exploring the narratives, the present work has provided deeper insight into pain as a holistic experience which, of course, varies across individuals.

This research has shown that ‘having chronic pain’ is a complex event of physical sensation, together with the imposed limitations and losses, and the resulting consequences. It is through an appreciation of this complex that the need to validate pain becomes evident. The importance of measuring pain-(in)validation levels is apparent given the emotional toll of guilt and shame, the potential stress-buffering effects of social support (Howard, Creaven, Hughes,
O'Leary, & James, 2017; Roberts, Klatzkin, & Mechlin, 2015), the recognition of social support as a resource for coping (Evers, Kraaimaat, Geenen, Jacobs, & Bijlsma, 2003; Mun et al., 2019), and greater treatment adherence in positive doctor-patient relationships (Martin, Williams, Haskard, & DiMatteo, 2005; Street, Makoul, Arora, & Epstein, 2009). Specifically, this research offers a conceptual definition of pain-validation, and a means of operationalizing the pain-validation construct so that it can be measured. While featuring the capacity to measure pain-invalidation by members of the community, the P-VS is distinct from the pre-existing measure of pain-invalidation, the Illness Invalidation Inventory (3*I; Kool et al., 2010), in its additional provision for measuring both self-invalidation and over-validation.

The first step in development of the P-VS was to clearly define the pain-validation construct. Through a systematic process of literature review and thematic analysis of pain patient narratives, detailed in Chapters 2 and 3, pain-validation was defined as comprising three essential elements:

(i) belief and acknowledgment that the experience is real and true for the individual.

(ii) acceptability of the individual’s pain experience as one that can be understood and empathized.

(iii) communication to the individual that their pain experience is believed and acceptable.

Study 1 also provided for the construction of a broad item pool, including statements representing the entire range of construct dimensions. Content validity of the item pool was enhanced in Study 2 through a process of expert review and
pilot feedback, to make decisions about item relevance and wording, with consideration to the intended test population. Exploratory factor analysis performed on survey responses to the broad item pool saw the generation of a proposed factor structure of pain-validation, and directed the reduction of items to those best measuring the construct (Chapter 4). Study 3 was dedicated to confirming and validating the proposed P-VS model. Validity evidence of the instrument’s internal structure was demonstrated through a process of confirmatory factor analysis with the use of structural equation modelling to identify the most suitable final model for testing pain-validation (Chapter 5).

Results from Chapters 4 and 5 provided support for the first major claim of this thesis, that pain-validation can be effectively measured using the 4 subscales: ‘Invalidation by the Self’, ‘Invalidation by Immediate Others’, ‘Invalidation by Healthcare Professionals’, and ‘Over-validation’. Soundness of the 4-factor P-VS measure was reinforced in Chapter 6 with the demonstration of high test-retest reliability, and high internal consistency for each subscale. Evidence for the validity of the P-VS was shown in Chapter 6, through an examination of the relationships between pain-validation and associated constructs. Instrument validity and reliability demonstrated through these findings offer support for the second thesis statement, that the P-VS is suitable for use by healthcare professionals as an early assessment tool to detect problematic pain-validation levels in chronic pain patients.

**Research Strengths and Limitations**

A considerable strength of the research is that development of the P-VS item content was based on research drawn from a systematic search and examination of
hundreds of pain narratives from worldwide literature. A common approach to constructing an item list for a new psychometric measure is the use of semi-structured interviews or researcher-led focus groups. However, the undertaking of such an extensive narrative analysis was thought to provide more breadth for the purposes of informing themes in the creation of an item pool that was maximally representative of people with chronic pain. A limitation to consider is that, although the collection of survey data through Prolific offered access to a wide range of nationalities, in actuality, the bulk of responses came from Western European countries and North America. Thus, the development of the P-VS was largely based on responses from Western societies. More studies are needed to validate the P-VS and its relevance to other populations, globally.

Further validation studies with instruments such as the Illness Invalidation Inventory (3*I; Kool et al., 2010), and others that may prove to be closely aligned with the pain-invalidation construct, are needed. The over-validation construct could be further examined with studies employing solicitousness scales, for example, including some items from the Multidimensional Pain Inventory (MPI) – previously named the West Haven-Yale Multidimensional Pain Inventory (WHYMPI; Kerns, Turk, & Rudy, 1985). Section B of the MPI refers to treatment toward the pain patient by their ‘significant other’ and contains items that are representative of over-validation and, indeed, a small number representing pain-invalidation. The issue of pain participant’s concentration fatigue (Glass et al., 2011; Sturgeon, Darnall, Kao, & Mackey, 2015) was a limiting factor in the survey studies of the present research that precluded the use of all possible comparable measures in these preliminary validation studies of the P-VS.
Together with construct measures relevant to pain-validation, potential predictors of pain-validation assessed in the regression analyses included gender, age, and pain-frequency. Again, however, the issue of concentration fatigue in pain populations limited the survey capacity to collect data on other variables that may be predictors of pain-validation, such as mood, quality of relationships, or pain interference. While the present research included a question asking participants to rate their average pain intensity on a typical day, it was subsequently recognized that, for many, pain-intensity is widely variable from day to day, and within a single 24-hour period. Thus, pain-intensity was deemed unsuitable for inclusion in the regression analyses of predictor variables. The need to cap the number of survey questions imposed a limitation on identifying whether pain intensity may relate to pain-invalidation or over-validation.

One of the known limitations of self-report survey data is the possibility for the individual’s answers to be affected by social desirability bias (Fisher & Katz, 2000). In this research, the likelihood of such bias was minimized, firstly, by allowing anonymity of responses. Secondly, the questionnaires were self-administered, thereby removing the prospect of intimidation caused by the presence of a researcher. These features of the research may be considered as methodological strengths, given the alternative of having people answer surveys in their doctor’s clinic, and the potential for concerns regarding the consequences of having responses reviewed by such stakeholders. Additionally, the survey offered a space for participants to have their experiences of pain-invalidation to be heard and noted. Such an opportunity was valued by the participants, as indicated in the qualitative feedback in the open comments section at the conclusion of the
pain-validation surveys. This sentiment suggests that participants gave honest responses to inquiries regarding their pain-(in)validation experiences.

Collection of the data via self-report survey did not allow for rigorous screening regarding specific diagnosis of pain conditions, and thus it is possible that some participants self-diagnosed their particular condition. For the purposes of this research, however, the important criterion was having chronic pain. The pre-screening tool in Prolific, together with specific survey questions inquiring about pain frequency and duration of the pain condition, were sufficient indicators of a candidate’s suitability for the study. It is also noteworthy that, in the process of survey development, more than 50% of respondents indicated having back pain and / or headache, while a smaller proportion of individuals indicated having other pain conditions. Additional studies may be needed to further affirm the validity and relevance of the P-VS for individuals across a variety of pain-conditions. Relatedly, a great number of participants indicated having multiple pain conditions. Comorbidity of pain conditions imposes a substantial limitation when investigating particular research questions, such as identifying potential differences in pain-validation levels among pain conditions. Studies designed to target individuals with specific pain conditions may provide informative data for such purposes.

Some researchers suggest that decreased levels of social contact (Johnson, 2005), and the anonymity of online survey participation (Meade & Craig, 2012) may reduce participants’ perceived accountability and increase the likelihood for inattentive responses, compared to researcher-monitored data collection. As inattentive responses can result from the cognitive effort required for the task, the
design of surveys involved a careful balance between obtaining sufficient information, and avoidance of cognitive over-taxing (Krosnick & Presser, 2010). Nonetheless, individuals likely ranged in their capacity to maintain attention throughout the test-taking process. Thus, it is possible that, for some individuals, ‘tired’ or unmotivated responses to items toward the end of any given survey could have lessened the accuracy of construct measurement in those instances. Responses were screened for evidence of ‘content non-responsivity’, and such responses were removed prior to data analysis. However, less obvious occurrences of careless responding may have gone undetected in some cases. To help balance the effects of weakened response motivation across the various measures in the CFA round of the pain-validation survey development, the presentation of questionnaires in the overall survey was randomized.

Potential Uses of the Pain-Validation Scale

The P-VS could be of benefit in numerous ways when used in the early stages of psychological assessment of chronic pain patients. Firstly, the P-VS allows the therapist to identify sub-optimal levels of pain-validation by the self or important others in the patient’s life. Identification of such issues may help inform the type of psychotherapeutic approach to be employed by the therapist, particularly in the early stages of therapy. High scores on any of the first 3 subscales indicate higher levels of pain-invalidation in the respective domains of Self, Immediate Others, or with Healthcare Professionals.

High levels of Invalidation by the Self may call for a closer look at the individual’s attitudes toward pain. The therapist may direct attention toward exploring guilt, shame, and the cognitive dissonance arising from being forced to
living separately from one’s close-held values. Additional approaches aligned with self-compassion therapy may be beneficial (Barnard & Curry, 2011) by way of reframing the client’s attitudes toward the self, while possibly exploring the client’s (historical) family culture in terms of their attitudes toward pain, and its potential role in the formation of the client’s own critical judgement toward the self in pain.

With regard to *Invalidation by Immediate Others or by Healthcare Professionals*, literature suggests that pain-invalidation may be a barrier to successful pain management in numerous ways. Pain management therapies often employ a range of cognitive and behavioural change strategies that can be difficult to establish and maintain (Teper, Segal, & Inzlicht, 2013). Success may be even less likely for those whose pain has not been recognized since, as indicated by Linehan (1997), clients in therapy may be resistant to change if their feelings have not first been validated. The considerable motivation required for change may be undermined by failure to first acknowledge and appreciate the distress and suffering experienced by the individual. Also identified as key to treatment adherence is a high quality doctor-patient relationship (Martin et al., 2005; Street et al., 2009). Validation may provide the building blocks to a trust-infused therapeutic relationship, thereby promoting adherence to treatment.

Additionally, the P-VS could be employed more widely in healthcare settings as a gauge to patient satisfaction with their healthcare professionals. Consistent returns of high scores on the ‘Invalidation by Healthcare Professionals’ subscale may speak to the need for staff in these settings to undergo specific training related to building doctor-patient relationships. There are notable challenges to
overcome in pain-related communications, including the insufficiency of language for patients to convey experiences of pain, and the physician’s perspective as an observer with potentially different beliefs and biomedical inclinations (Cohen, Quintner, & van Rysewyk, 2018). The ‘third space’ approach to the clinical encounter (Cohen, Quintner, Buchanan, Nielsen, & Guy, 2011; Quintner, Cohen, Buchanan, Katz, & Williamson, 2008) is one in which understandings of pain can be shared between patient and healthcare professional, and neither party is more ‘expert’ than the other. Techniques such active listening, reflecting patient communications, verbalizing inferences arising from patient disclosures, and normalizing patient experiences (Edmond & Keefe, 2015) are some ways that healthcare professionals can be trained to better validate their patients.

High scores on the ‘Over-validation’ subscale may provide equally important information, possibly indicating a need to explore the family dynamic. Well-meaning others may assume limitations of the pain-afflicted individual and impede functional rehabilitation by taking over daily activities and tasks that the individual could otherwise manage. Thus, opportunities to demonstrate self-efficacy are missed, making it difficult to build evidence to counter pain-catastrophizing thoughts. Therapists may, therefore, find this subscale valuable in determining whether psychoeducation about pain (Smith, Herman, & Smith, 2015), and establishing a sense of feeling ‘safe’ to move (Gallagher, McAuley, & Moseley, 2013), are the most effective starting points.
Future Directions

Further studies are required to confirm the validity and reliability of the P-VS, particularly amongst cultural samples who have been under-represented thus far. Studies targeting a range of pain conditions beyond headache, neck and back pain may also provide useful validity evidence to support the representativeness of the P-VS across a variety of pain conditions. It may also be beneficial to test whether validity and reliability hold in an adapted version of the scale (replacing the term ‘pain’ with ‘illness’) measuring symptom validation of people with contested illnesses such as Chronic Fatigue syndrome, Irritable Bowel Syndrome, or Multiple Chemical Sensitivities syndrome (Murphy, Kontos, & Freudenreich, 2016).

The issue of pain-invalidation may be more prevalent for certain pain conditions than others. Fibromyalgia is a good example of a contested illness where patients often struggle to have their condition legitimized by medical professionals, and are left feeling stigmatized by friends and family (Armentor, 2017). For those with other illnesses where stigmatization is a prominent issue, such as HIV (Scott et al., 2018), pain-invalidation may also be a particularly relevant stressor. The P-VS may be of value in future studies that help identify such pain conditions that are commonly invalidated, and point to the need for greater public or medical education around these illnesses. Pain-invalidation may also be more pertinent to certain sub-populations than others. Studies suggest that some healthcare professionals have more negative attitudes toward patients of lower socio-economic status (Hollingshead, Matthias, Bair, & Hirsh, 2016). It may be useful to investigate whether such attitudes by healthcare professionals...
translate to patients as pain-invalidation, indicating a greater potential for pain-invalidation to be experienced by socio-economically disadvantaged individuals.

With regards to the potential relationship between pain-invalidation, psychosocial stress and the exacerbation of chronic pain proposed in Chapter 2 (Figure 1), the P-VS and outcomes of corresponding interventions may be used to determine whether pain-invalidation is a stressor that relates to perceived levels of pain. Given the literature identifying the link between stress and pain (Davis et al., 2008; John-Henderson, Stellar, Mendoza-Denton, & Francis, 2015; Sturgeon et al., 2016), and the present findings that depict the psychosocial stresses of being invalidated, future studies could be conducted to demonstrate, more directly, whether improved validation corresponds to lowered pain levels. It may also be valuable to conduct research combining both self-reported invalidation using the P-VS, and observational or behavioural measurements of invalidation. Studies show that the sequence of events occurring within partner communications, whether validating or invalidating, can impact on affect and pain levels of patients in married couples where one or both partners have chronic pain (Leong, Cano, & Johansen, 2011). Any of the above studies may also incorporate a comparison of scores on the P-VS with scores on measures of social support, with the aim of establishing pain-validation as a resource for coping with stress and/or pain (Eisenberger, Taylor, Gable, Hilmert, & Lieberman, 2007; Hobfoll, 2002).

Accounts within the literature suggest that pain patients can also experience invalidation from within the healthcare system, generally (Gogovor et al., 2017). This may occur at the level of admission staff in hospitals (Brooks, Unruh, & Lynch, 2015), and from healthcare professionals other than the primary physician,
for example, pharmacists refusing to issue opioid medications (Antoniou et al., 2019; Vallerand & Nowak, 2010). As such, there is the potential for future expansion of the P-VS, or an alternative version, to explore a range of invalidating experiences, systemically, for those with chronic pain.

Investigation into the contributing effects of variables such as pain-interference or pain-intensity may uncover useful predictors of pain-invalidation or over-validation. It is possible, for example, that people going through more intense periods of pain may be experiencing more pain-invalidation (Molzof et al., 2020). Longitudinal studies tracking the association between pain intensity and pain-invalidation may, therefore, prove beneficial. Similarly, the relationship can be examined through comparing average pain intensity in a set period (across one week) with pain-invalidation or over-validation.

More research is also needed to establish pain-validation scoring norms for different age, gender groupings, and pain conditions. Determining norms for each pain-validation subscale would provide a means of identifying problematic levels of invalidation or over-validation in each domain for the tested individual. Studies to develop evidence-based pain management interventions focused on empathic or validating therapist communications, could also be conducted. For example, interventions may be applied, with scores on the P-VS used as a dependent variable in a between-groups comparison to assess the efficacy of the test intervention protocol against a control (treatment as usual) protocol. Alongside use of the P-VS measure, the collection of qualitative data would be recommended, asking questions of the patients regarding perceived quality of the therapeutic relationship with their healthcare professional.
Concluding Remarks

A primary motivator for this research was the prevailing message in pain narratives, that the lack of belief from others is, in many ways, worse than the pain itself. Qualitative feedback offered by participants of the pain-validation surveys suggested an inherent value in developing a means of measuring this sense of invalidation or, indeed, over-validation. Numerous participants expressed appreciation for the opportunity to have their experiences recognized, in contrast to various patient encounters within the community where pain has gone unsanctioned.

Pain is necessarily subjective. Whether triggered by psychological stress, mechanical inflammation, or the neurological sequelae of previous injury, chronic pain calls attention to an unresolved concern. Considerable evidence has shown the benefits of validating these messages of dis-ease within the body and psyche. Ultimately, however, the importance of validating pain may be determined by the degree to which one believes that it is the responsibility of a compassionate society to hear and acknowledge the suffering expressed by its members. This research has highlighted that, often, contained within the communication of pain is the distress of disrupted identity, isolation, and losses associated with having pain. Given the pervasiveness of these effects, the torment of society’s refusal to validate an individual’s pain may be best understood as a rejection of the existential self and, by extension, rejection of the individual. Thus, more than acknowledging an unpleasant sensory event, validating chronic pain is to embrace the grieving and potentially disconnected individual, providing support as they unpack the origins, and address the outcomes of their experience.
Chapter 7: Discussion

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Chapter 7: Discussion

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Monday, 20 March 2017

Dr Helen Correia  
School of Psychology and Exercise Science  
Murdoch University

Dear Helen,

Project No.  2017/017  
Project Title  Psychological Stressors in the Pain Experience: The Development of a Pain-Validation Scale

Thank you for addressing the conditions placed on the above application to the Murdoch University Human Research Ethics Committee. On behalf of the Committee, I am pleased to advise the application now has:

OUTRIGHT APPROVAL

Approval is granted on the understanding that research will be conducted according the standards of the National Statement on Ethical Conduct in Human Research (2007), the Australian Code for the Responsible Conduct of Research (2007) and Murdoch University policies at all times. You must also abide by the Human Research Ethics Committee’s standard conditions of approval (see attached). All reporting forms are available on the Research Ethics and Integrity web-site.

I wish you every success for your research.

Please quote your ethics project number in all correspondence.

Kind Regards,

Dr. Erich von Dietze  
Manager  
Research Ethics and Integrity

cc:  Prof Peter Drummond, Dr Graeme Ditchburn and Melinda Micola
Appendix B – Item Pool and Instructions for Expert Review

Item Pool for the Pain-Validation Scale

Chronic pain sufferers often report a sense of being disbelieved or disparaged when their doctor can find no organic cause for the pain (Barker, 2011; Matthais et al., 2010; Werner & Malterud, 2003). The invalidation of one’s pain experience can carry over to important social relationships with friends and work colleagues. A range of negative consequences can arise from the invalidation of an individual’s pain experience including emotional distress in the form of guilt, shame, isolation, anxiety and depression (Birk, 2013; Sim & Madden, 2008; Slade, et al., 2009). At the other end of the validation spectrum lies the issue of excessive validation. Over-attendance to an individual’s ongoing pain behaviours may be detrimental by way of diminishing their capacity to function normally, and acting to cement the sick role generally (Romano, Jensen, Schmaling, Hops, & Buchwald, 2009).

The absence of substantial measures of validation for those with chronic pain represents a clear gap in the literature on pain management. I am aiming to develop a pain-validation measure that incorporates items indicative of (in)validation, social support, and indications of over-validation. This instrument is designed for completion by the clients of clinical, counselling and pain management therapists. Clients will be asked to indicate their level of agreement for each of the items in the final scale. Importantly, with such data the therapist may be better informed about a potential structure for effective pain management interventions.

The following items were generated as a result of performing a systematic search of peer-reviewed journal articles related to the construct of pain-validation, followed by a thematic analysis of the narrative expressions of people with chronic pain.

As a professional with extensive experience in dealing with people who have chronic pain, I request your expert opinion and feedback on the following items, bearing in mind their relevance to clients with chronic pain, relevance to the construct of pain-validation, item content, general readability, and how they might be interpreted and understood. Would you please read the items attached and indicate by placing an X in the appropriate box, whether you would Keep the item in the pool, Delete the item, or Change the item. In the next column, please note any Comments or suggested Changes regarding any particular items, where you see fit. Finally, the items fall under 6 sections (denoted by the green section headings) - For each section, would you please indicate the 3 Best, and 3 Weakest items by simply typing a B or a W in the last column, against the relevant items.

I would like to acknowledge my appreciation of yourself as one of my subject matter experts in the acknowledgements section of my thesis and the journal article that I aim to write from this research. No feedback comments will be linked to your name in these documents. If you would prefer not to be publicly acknowledged, please let me know.
Note: Participants will be asked to respond to each statement on a Likert-style scale, from 1 = ‘Strongly Disagree’, through to 7 = ‘Strongly Agree’

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<tr>
<th>Item</th>
<th>Keep item</th>
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<th>Comment, or note changes to make</th>
<th>Best (B) 3 items/ Weakest (W) 3 items</th>
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<tr>
<td><strong>Pain-Validation by the Self</strong></td>
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<tr>
<td>I do not think less of myself for having a pain condition.</td>
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<td>Having a pain condition does not make me any less valuable as a person.</td>
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<td>I am ashamed of having a pain condition.</td>
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<td>I see my pain as a personal failing.</td>
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<td>I feel like a burden to others because of my pain condition.</td>
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<td>I should have found a way to get rid of my pain by now.</td>
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<td>I feel guilty talking about my pain condition.</td>
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<td>I allow myself to feel pain without being self-critical</td>
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<td>My pain condition makes me feel abnormal.</td>
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<td>Having pain is a sign of weakness.</td>
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<td>I get impatient with myself about my pain condition.</td>
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<td>Having pain is a sign of poor character.</td>
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<td>I don’t feel right talking about my pain because I know some other people have it worse than me.</td>
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<td>I don’t talk about my pain because I don’t want to be a ‘whinger’.</td>
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<td>I get angry at myself for having pain.</td>
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<td>I feel like I am letting close family members down because my pain limits me.</td>
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<td>I am caring toward myself when I feel pain.</td>
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Note: Participants will be asked to respond to each statement on a Likert-style scale, from 1 = ‘Strongly Disagree’, through to 7 = ‘Strongly Agree’

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<tr>
<td>I don’t feel like I am contributing enough at home, because of my pain.</td>
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<tr>
<td>I try to hide my pain because I don’t want everyone else to know.</td>
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<td>I sometimes wonder if my pain is ‘all in my head’.</td>
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<td>Having a pain condition makes me feel embarrassed.</td>
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<td>Sometimes my pain makes me feel useless.</td>
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<td>Having a pain condition makes me feel unattractive.</td>
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<td>Having pain does not mean that I have failed.</td>
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<td><strong>Pain-Validation by Significant Others</strong></td>
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<tr>
<td>My close family members are very supportive of me in my pain condition.</td>
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<td>People are generally sympathetic about my pain.</td>
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<td>People don’t seem to believe that I have pain because I look well.</td>
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<td>People seem to get annoyed with me about my pain condition.</td>
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<td>It seems that others who hear about my pain condition think that I am being weak.</td>
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<td>People tend to be intolerant of my pain condition.</td>
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<td>People seem to think that I use my pain to get attention.</td>
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<tr>
<td>I feel like my family is disappointed in me because of my pain condition.</td>
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<td>In terms of my pain condition, I feel well supported by people in the community.</td>
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<td>My family is accepting of me in my pain condition.</td>
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<td>People seem to think that I am exaggerating my pain symptoms.</td>
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<td>My friends don’t really want to hear about my pain.</td>
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<tr>
<td>Others do not seem to realize how hard it is for me to do normal daily activities.</td>
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<tr>
<td>Others seem to think that I use my pain condition to be lazy.</td>
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<tr>
<td>In terms of my pain, people don’t seem to understand what I am going through.</td>
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<td>People seem to think it is my own fault that I still have pain.</td>
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<td>People think I am faking pain symptoms to get financial benefits.</td>
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<td>Others don’t believe that my pain is real because there is no obvious evidence of it.</td>
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<td>Others are sick of hearing about my pain.</td>
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<td>Others say that I need to ‘toughen up’</td>
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<tr>
<td>People share with me about their own pain experiences, or experiences of people they know.</td>
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<tr>
<td>I don’t feel like I can talk about my pain because others do not understand my condition.</td>
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<td>Some family members make me feel guilty for having pain.</td>
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<td>I feel like I am being judged negatively by others for having pain.</td>
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<td>People are surprised at how well I function with my pain condition.</td>
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**Pain-Validation by Healthcare Professionals**

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<tr>
<td>When I explain my pain to my doctor, I feel like he/she is listening and trying to understand.</td>
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<td>My doctor seems to believe that I am doing my best to get rid of my pain.</td>
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<td>My doctor is not very sympathetic about my pain condition.</td>
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<tr>
<td>It seems like my doctor thinks that my pain is my own fault.</td>
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<td>My doctor has indicated that many other people have similar symptoms to me.</td>
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<td>My doctor doesn’t believe that I have the amount of pain I describe, because I look too well.</td>
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<tr>
<td>It feels like my doctor does not really believe that I have a pain condition.</td>
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<tr>
<td>My doctor talks to me about my pain condition as if it is not real.</td>
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<td>My doctor seems to think my pain is all psychological rather than physical.</td>
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<td>I feel stigmatized as a drug abuser when I ask for more pain medication.</td>
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<td>I feel like my doctor genuinely cares about my pain.</td>
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<td>My doctor appears sympathetic to my pain.</td>
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<td>My doctor doesn’t take me seriously when I talk about my pain.</td>
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<td>I feel like my doctor thinks I am a hypochondriac when I talk about my pain.</td>
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<td>My doctor acts like I don’t do enough to help my pain condition.</td>
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<td>My doctor seems to think I am faking or exaggerating my symptoms.</td>
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<td>My doctor seems irritated with me for my ongoing pain.</td>
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<td>I feel like my doctor is not listening when I talk about my pain.</td>
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<td>My doctor does not take the time to fully understand about my pain condition.</td>
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<td>My doctor makes me feel guilty whenever I tell them about my pain.</td>
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<td>My doctor does not value my input when making decisions about my treatment plan.</td>
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<td>My doctor does not take my preferences into account when deciding on a treatment plan.</td>
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<tr>
<td><strong>Endorsement of Pain Behaviours – Over-validation</strong></td>
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<td>I don’t want to do anything physical because I am scared of making my pain worse.</td>
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<tr>
<td>My partner /family member does most physical tasks for me.</td>
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<td>Others assume I cannot do tasks that I am capable of.</td>
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<td>My partner/ family member encourages me to rest and not to push myself.</td>
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<td>I would like my partner/family member to let me do more for myself.</td>
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<td>I feel like other people in my family are too intrusive while they are trying to help me.</td>
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<td>Others don’t seem to believe that I am capable of doing things myself, in my condition.</td>
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<td>Others tend to take over tasks I could do myself.</td>
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<td>I focus on little else all day besides my pain</td>
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<td>Others try to stop me doing tasks because they think I will make my pain worse.</td>
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<tr>
<td>Others who know about my pain make too much of a big deal about it.</td>
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<td>Certain family members seem to prefer it when I am dependent on them.</td>
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<tr>
<td>Certain family members make it difficult for me to remain independent.</td>
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<tr>
<td>Even though I have pain, I would like others to let me do more things on my own.</td>
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</tbody>
</table>

© Nicola, Correia, Drummond, & Ditchburn; Murdoch University
Note: Participants will be asked to respond to each statement on a Likert-style scale, from 1 = ‘Strongly Disagree’, through to 7 = ‘Strongly Agree’

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<th>Comment, or note changes to make</th>
<th>Best (B) 3 items/ Weakest (W) 3 items</th>
</tr>
</thead>
<tbody>
<tr>
<td>My doctor helps me plan ways to stay as active as possible.</td>
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<tr>
<td>My partner/family member encourages me to stay as active as possible.</td>
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<tr>
<td>My partner/family member encourages me to function more independently.</td>
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<tr>
<td>My family comments positively on occasions that I have shown improvement in my ability to perform painful tasks.</td>
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</table>

**Expectation Stress – Self-expectations**

**With regard to my pain condition…..**

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<tr>
<td>I often have a nagging sense of not being good enough.</td>
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<tr>
<td>I feel guilty if I am not working or doing chores.</td>
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<td>I often get frustrated with myself for not meeting my daily goals.</td>
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<td>I feel lazy if I am not doing something useful.</td>
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<td>My day feels meaningless if I have not been productive.</td>
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<td>If I don’t push myself, then I have less respect for myself.</td>
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<td>I often get depressed because I have not achieved what I wanted to.</td>
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<tr>
<td>I tend to ignore pain or illness symptoms and keep pushing through my day.</td>
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</tbody>
</table>
Note: Participants will be asked to respond to each statement on a Likert-style scale, from 1 = ‘Strongly Disagree’, through to 7 = ‘Strongly Agree’

<table>
<thead>
<tr>
<th>Item</th>
<th>Keep item</th>
<th>Delete item</th>
<th>Change item</th>
<th>Comment, or note changes to make</th>
<th>Best (B) 3 items/ Weakest (W) 3 items</th>
</tr>
</thead>
<tbody>
<tr>
<td>I tend to try to do too much by myself, without asking for help.</td>
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<tr>
<td>I push myself to get things done otherwise no one else will do them.</td>
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<tr>
<td>Asking for help from others makes me feel a bit ‘weak’.</td>
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<tr>
<td>I get stressed when I fail to meet my expectations for the day.</td>
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<tr>
<td>I am very satisfied with my performance or achievements on most days.</td>
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<tr>
<td>In general, I feel like I am achieving the things that are important to me.</td>
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<tr>
<td>I can easily delegate tasks to others so that I have a more manageable day.</td>
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<tr>
<td>No matter how hard I try, I cannot seem to accomplish all that I should each day.</td>
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</tbody>
</table>

**Expectation Stress – Social Others’ Expectations**

**With regard to my pain condition…..**

<table>
<thead>
<tr>
<th>Item</th>
<th>Keep item</th>
<th>Delete item</th>
<th>Change item</th>
<th>Comment, or note changes to make</th>
<th>Best (B) 3 items/ Weakest (W) 3 items</th>
</tr>
</thead>
<tbody>
<tr>
<td>It feels like other people think I should be doing better.</td>
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<tr>
<td>I often feel the pressure of not living up to other people’s standards.</td>
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<tr>
<td>I am always striving to meet other people’s expectations.</td>
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<tr>
<td>If I don’t meet the expectations of others, they will think that I am incapable.</td>
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</tbody>
</table>
Note: Participants will be asked to respond to each statement on a Likert-style scale, from 1 = ‘Strongly Disagree’, through to 7 = ‘Strongly Agree’

<table>
<thead>
<tr>
<th>Item</th>
<th>Keep item</th>
<th>Delete item</th>
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<th>Comment, or note changes to make</th>
<th>Best (B) 3 items/ Weakest (W) 3 items</th>
</tr>
</thead>
<tbody>
<tr>
<td>My family tends to focus on the things that I have not yet achieved, rather than what I have achieved.</td>
<td></td>
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<tr>
<td>People rarely acknowledge how hard I am trying.</td>
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<tr>
<td>Others expect me to reach unrealistic goals in my day.</td>
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<tr>
<td>It is important to me that others think that I am doing well.</td>
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<tr>
<td>My family will think I am a failure if I don’t achieve their expectations.</td>
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<tr>
<td>People constantly ask for more than I can give.</td>
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<tr>
<td>My best doesn’t seem good enough for those around me.</td>
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<tr>
<td>My family tend not to give me much sympathy if I have an illness or injury.</td>
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<tr>
<td>People expect me to ‘push on’ even when I am tired or unwell.</td>
<td></td>
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<tr>
<td>I feel like I am letting other people down if I don’t achieve my goals.</td>
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<tr>
<td>Others may not think that I am a good person if I don’t try hard enough.</td>
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<tr>
<td>If I don’t push myself, others will think I am being lazy.</td>
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<tr>
<td>I am good at setting limits in terms of what others can ask of me.</td>
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<tr>
<td>My efforts are good enough for those around me.</td>
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</tbody>
</table>
Note: Participants will be asked to respond to each statement on a Likert-style scale, from 1 = ‘Strongly Disagree’, through to 7 = ‘Strongly Agree’

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<th>Comment, or note changes to make</th>
<th>Best (B) 3 items/ Weakest (W) 3 items</th>
</tr>
</thead>
<tbody>
<tr>
<td>I generally do what I think is reasonable, without worrying about what others think.</td>
<td></td>
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<tr>
<td>Others close to me show understanding when I am struggling or under pressure.</td>
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<tr>
<td>My family thinks highly of me regardless of my ability to achieve goals.</td>
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<tr>
<td>Others appreciate me for who I am, not what I can achieve.</td>
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<tr>
<td>Other people’s expectations don’t really matter to me.</td>
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</tbody>
</table>
Note: Participants will be asked to respond to each statement on a Likert-style scale, from 1 = ‘Strongly Disagree’, through to 7 = ‘Strongly Agree’

In your opinion, have any themes relevant to Pain-Validation been missed?

Additional Comments:

Thank you kindly for your time and feedback.

Please return your feedback to: M.Nicola@murdoch.edu.au

This research has been approved by Murdoch University’s Human Research Ethics Committee.
Appendix C - Pilot Item List Feedback Task

Pilot Pain-Validation items

Study Information
We invite your feedback and suggestions in the development of a survey aiming to measure the level of validation / invalidation experienced by people with chronic pain. This study is being conducted as part of my PhD. research at Murdoch University.

Pain-Validation People with chronic pain i.e. pain symptoms lasting for 3 months or longer, often report a sense of being disbelieved or disparaged when their doctor can find no organic cause for the pain (Barker, 2011; Matthais et al., 2010; Werner & Malterud, 2003). The invalidation of one’s pain experience can carry over to important social relationships with friends and work colleagues. A range of negative consequences can arise from the invalidation of an individual’s pain experience including emotional distress in the form of guilt, shame, isolation, anxiety and depression (Birk, 2013; Sim & Madden, 2008; Slade, et al., 2009). At the other end of the validation spectrum lies the issue of excessive validation. Over-attendance to an individual’s ongoing pain behaviours may be detrimental by way of diminishing their capacity to function normally, and acting to cement the sick role generally (Romano, Jensen, Schmaling, Hops, & Buchwald, 2009).

Study Purpose The absence of substantial measures of validation for those with chronic pain represents a clear gap in the literature on pain management. The aim of this study is to design a comprehensive survey that measures the degree to which people feel in/validated in their experience of chronic pain. Such a pain-validation instrument may be beneficial for use by healthcare professionals in the early stages of a client’s pain-management therapy. Clients will be asked to indicate their level of agreement for each of the items in the final scale. Importantly, with such data the therapist may be better informed about a potential structure for effective pain management interventions. The following survey items were generated as a result of performing a systematic search of peer-reviewed journal articles related to the construct of pain-validation, followed by a thematic analysis of the narrative expressions of people with chronic pain.

What Your Feedback Will Involve It is estimated that your feedback here will take about 15 minutes to complete. You will be asked to review a series of potential survey items, and offer any comments, feedback, or suggestions if you wish, with regard to how well you are able to understand the items, the likelihood of consistent interpretation of the meaning for survey items, user friendliness of the 7-point response scale, clarity of the survey instructions for participants, or other comments that you feel may improve the survey. If you would like to offer your valuable feedback, please click on the forward arrow below to commence the activity. Thank you, your assistance with this research is appreciated.
Appendix C - Piloted Item List Feedback Task

Q1 Please write your name or initials (optional - for clarification on comments if necessary).

________________________________________________________________

End of Block: Study Information

Start of Block: Items

We would like your feedback on the following pool of questions being designed for a survey to measure the validation or invalidation experienced by people with chronic pain.

Please do not answer the actual survey items.

The survey items will be in groups of approximately 8, followed by a box where you can comment on any items in that group if you wish. Your comments about how the questions may be improved or even deleted from the final list, are welcome.

Page Break
Appendix C - Piloted Item List Feedback Task

Section 1.

The following text instructions and survey questions will be provided to participants undertaking the survey. Your comments on the instructions to participants, survey questions, and/or response scale are kindly requested. Please do not actually answer the survey items, only the feedback questions.

"Listed below are a number of statements concerning your feelings about having chronic pain. Please read each item and indicate how strongly you agree or disagree with the statement."

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Slightly Disagree</th>
<th>Neither Agree Nor Disagree</th>
<th>Slightly Agree</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
</tbody>
</table>

1. I think less of myself for having a pain condition.
2. I am ashamed of having a pain condition.
3. I am caring toward myself when I have pain.
4. I see my pain as a personal failing.
5. I feel guilty talking about my pain condition.
6. I feel like a burden to others because of my pain condition.
7. I should have found a way to get rid of my pain by now.
8. I allow myself to feel pain without being self-critical.

Q2 Do you have any comments or recommendations regarding any of the survey questions above? e.g. readability of questions (do they make sense?), possible ambiguity or misinterpretations, suitability to 7-point response scale provided, general item relevance, or other comments...

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Appendix C - Piloted Item List Feedback Task

Section 1. continued...
The following text instructions and survey questions will be provided to participants undertaking the survey. Your comments on the instructions to participants, survey questions, and/or response scale are kindly requested. Please do not actually answer the survey items, only the feedback questions.

"Listed below are a number of statements concerning your feelings about having chronic pain. Please read each item and indicate how strongly you agree or disagree with the statement."

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<th>Slightly Disagree</th>
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<th>Slightly Agree</th>
<th>Agree</th>
<th>Strongly Agree</th>
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</thead>
<tbody>
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<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
</tbody>
</table>

9. My pain condition makes me feel abnormal.

10. Having pain is a sign of weakness.

11. I get impatient with myself about my pain condition.

12. Having pain is a sign of poor character.

13. I don't feel right talking about my pain because I know some other people have it worse than me.

14. I don't talk about my pain because I don't want to be a 'whinger'.

15. I get angry at myself for having pain.

16. I feel like I am letting my partner and/or close family members down because my pain limits me.

Q3 Do you have any comments or recommendations regarding any of the survey questions above? e.g. readability of questions (do they make sense?), possible ambiguity or misinterpretations, suitability to 7-point response scale provided, general item relevance, or other comments...

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Appendix C - Piloted Item List Feedback Task

Section 1. continued...
The following text instructions and survey questions will be provided to participants undertaking the survey. Your comments on the instructions to participants, survey questions, and/or response scale are kindly requested. Please do not actually answer the survey items, only the feedback questions.

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<th>Slightly Disagree</th>
<th>Neither Agree Nor Disagree</th>
<th>Slightly Agree</th>
<th>Agree</th>
<th>Strongly Agree</th>
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<td>7</td>
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</table>

17. I don't feel like I am contributing enough at home, because of my pain.
18. I try to hide my pain because I don't want everyone else to know.
19. I sometimes wonder if my pain is 'all in my head'.
20. Having a pain condition makes me feel embarrassed.
21. Sometimes my pain makes me feel useless.
22. Having a pain condition makes me feel undesirable.
23. I tend to ignore pain or illness symptoms and keep pushing through my day.

Q4 Do you have any comments or recommendations regarding any of the survey questions above? e.g. readability of questions (do they make sense?), possible ambiguity or misinterpretations, suitability to 7-point response scale provided, general item relevance, or other comments...
Appendix C - Piloted Item List Feedback Task

Section 2.
The following text instructions and survey questions will be provided to participants undertaking the survey. Your comments on the instructions to participants, survey questions, and/or response scale are kindly requested. Please do not actually answer the survey items, only the feedback questions.

"Listed below are a number of statements about your experiences of others important to you, with regard to your chronic pain. The term 'close others' in this section refers to your partner, other close family members and friends, while additional items refer to 'people in general' in your community.

Please read each item and indicate how strongly you agree or disagree with the statement."

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Slightly Disagree</th>
<th>Neither Agree Nor Disagree</th>
<th>Slightly Agree</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
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<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
</tbody>
</table>

1. Close others are very supportive of me in my pain condition.
2. Close others are generally sympathetic about my pain.
3. Close others don't seem to believe that I have pain because I look well.
4. Close others seem to get annoyed with me about my pain condition.
5. It seems that close others who hear about my pain think that I am being weak.
6. Close others tend to be intolerant of my pain condition.
7. People in general seem to think that I use my pain to get attention.
8. I feel like close others are disappointed in me because of my pain condition.

Q5 Do you have any comments or recommendations regarding any of the survey questions above? e.g. readability of questions (do they make sense?), possible ambiguity or misinterpretations, suitability to 7-point response scale provided, general item relevance, or other comments...

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Appendix C - Piloted Item List Feedback Task

Section 2 continued...

The following text instructions and survey questions will be provided to participants undertaking the survey. Your comments on the instructions to participants, survey questions, and/or response scale are kindly requested. Please do not actually answer the survey items, only the feedback questions.

------------------------------------------------------------------------------------------------------------------

"Listed below are a number of statements about your experiences of others important to you, with regard to your chronic pain. The term 'close others' in this section refers to your partner, other close family members and friends, while additional items refer to 'people in general' in your community.

Please read each item and indicate how strongly you agree or disagree with the statement."

<table>
<thead>
<tr>
<th>Item</th>
<th>Statement</th>
</tr>
</thead>
<tbody>
<tr>
<td>9.</td>
<td>In terms of my pain condition, I feel well supported by people in general.</td>
</tr>
<tr>
<td>10.</td>
<td>Close others are accepting of me in my pain condition.</td>
</tr>
<tr>
<td>11.</td>
<td>Close others seem to think that I am exaggerating my pain symptoms.</td>
</tr>
<tr>
<td>12.</td>
<td>Close others don't really want to hear about my pain.</td>
</tr>
<tr>
<td>13.</td>
<td>Close others don't seem to realize how hard it is for me to do normal daily activities.</td>
</tr>
<tr>
<td>14.</td>
<td>Close others seem to think that I use my pain condition to be lazy.</td>
</tr>
<tr>
<td>15.</td>
<td>In terms of my pain condition, people in general don't seem to understand what I am going through.</td>
</tr>
<tr>
<td>16.</td>
<td>Close others seem to think it is my fault that I still have pain.</td>
</tr>
</tbody>
</table>
Appendix C - Piloted Item List Feedback Task

Q6 Do you have any comments or recommendations regarding any of the survey questions above? e.g. readability of questions (do they make sense?), possible ambiguity or misinterpretations, suitability to 7-point response scale provided, general item relevance, or other comments...

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Appendix C - Piloted Item List Feedback Task

Section 2 continued...
The following text instructions and survey questions will be provided to participants undertaking the survey. Your comments on the instructions to participants, survey questions, and/or response scale are kindly requested. Please do not actually answer the survey items, only the feedback questions.

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Please read each item and indicate how strongly you agree or disagree with the statement."

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<th>Strongly Disagree</th>
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<th>Slightly Disagree</th>
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<th>Slightly Agree</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
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<td>4</td>
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<td>7</td>
</tr>
</tbody>
</table>

17. People in general think that I am faking pain symptoms to get financial benefits.

18. Close others don't believe that my pain is real because there is no obvious evidence of it.

19. People in general are sick of hearing about my pain.

20. Close others say that I need to 'toughen up'.

21. I don't feel like I can talk about my pain because people in general do not understand my condition.

22. Some close others make me feel guilty for having pain.

23. I feel like I am being judged negatively by close others for having pain.

24. I feel like I am being judged negatively by people in general, for taking pain medication.

25. People in general are surprised at how well I function with my pain condition.
Appendix C - Piloted Item List Feedback Task

Q7 Do you have any comments or recommendations regarding any of the survey questions above? e.g. readability of questions (do they make sense?), possible ambiguity or misinterpretations, suitability to 7-point response scale provided, general item relevance, or other comments...

________________________________________________________________________________________

________________________________________________________________________________________

________________________________________________________________________________________

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Page Break
Appendix C - Piloted Item List Feedback Task

Section 3.
The following text instructions and survey questions will be provided to participants undertaking the survey. Your comments on the instructions to participants, survey questions, and/or response scale are kindly requested. Please do not actually answer the survey items, only the feedback questions.

"Listed below are a number of statements concerning experiences with your healthcare professional, with regard to your chronic pain. The phrase 'my healthcare professional' in this section refers to the MAIN healthcare professional who is managing your pain condition. For example, this may be a GP, a specialist doctor, or a physiotherapist.

Please read each item and indicate how strongly you agree or disagree with the statement."

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Slightly Disagree</th>
<th>Neither Agree Nor Disagree</th>
<th>Slightly Agree</th>
<th>Agree</th>
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</tr>
</thead>
<tbody>
<tr>
<td>1</td>
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<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
</tbody>
</table>

My healthcare professional...

1. ... listens and tries to understand when I explain my pain.
2. ... seems to believe that I am doing my best to get rid of my pain.
3. ... seems to think that my pain is my own fault.
4. ... has indicated that many other people have similar symptoms to me.
5. ... doesn’t believe that I have the amount of pain I describe, because I look too well.
6. ... does not seem to really believe that I have a pain condition.
7. ... talks to me about my pain condition as if it is not real.
8. ... seems to think my pain is all psychological rather than physical.
Appendix C - Piloted Item List Feedback Task

Q8 Do you have any comments or recommendations regarding any of the survey questions above? e.g. readability of questions (do they make sense?), possible ambiguity or misinterpretations, suitability to 7-point response scale provided, general item relevance, or other comments...

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Page Break
Appendix C - Piloted Item List Feedback Task

Section 3 continued...

The following text instructions and survey questions will be provided to participants undertaking the survey. Your comments on the instructions to participants, survey questions, and/or response scale are kindly requested. Please do not actually answer the survey items, only the feedback questions.

"Listed below are a number of statements concerning experiences with your healthcare professional, with regard to your chronic pain. The phrase 'my healthcare professional' in this section refers to the MAIN healthcare professional who is managing your pain condition. For example, this may be a GP, a specialist doctor, or a physiotherapist.

Please read each item and indicate how strongly you agree or disagree with the statement."

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
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<td>1</td>
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<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
</tbody>
</table>

My healthcare professional...

9. ... seems to judge me negatively when I ask for more pain medication.
10. ... seems to genuinely care about my pain.
11. ... doesn’t take me seriously when I talk about my pain.
12. ... seems to think I am faking or exaggerating my symptoms.
13. ... seems irritated with me for my ongoing pain.
14. ... does not take the time to fully understand about my pain condition.
15. ... makes me feel guilty whenever I tell them about my pain.
16. ... values my input when making decisions about my treatment plan.
17. ... takes my preferences into account when deciding on a treatment plan.
Appendix C - Piloted Item List Feedback Task

Q9 Do you have any comments or recommendations regarding any of the survey questions above? e.g. readability of questions (do they make sense?), possible ambiguity or misinterpretations, suitability to 7-point response scale provided, general item relevance, or other comments...

________________________________________________________________________

________________________________________________________________________

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Appendix C - Piloted Item List Feedback Task

Section 4.
The following text instructions and survey questions will be provided to participants undertaking the survey. Your comments on the instructions to participants, survey questions, and/or response scale are kindly requested. Please do not actually answer the survey items, only the feedback questions.

"Listed below are a number of statements about your level of activity with regard to your chronic pain. Please read each item and indicate how strongly you agree or disagree with the statement."

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Slightly Disagree</th>
<th>Neither Agree Nor Disagree</th>
<th>Slightly Agree</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
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<td>7</td>
</tr>
</tbody>
</table>

1. I don't want to do anything physical because I am scared of making my pain worse.

2. Close others do most physical tasks for me.

3. Close others assume I cannot do tasks that I am capable of.

4. Close others encourage me to rest and not to push myself.

5. I would like close others to let me do more for myself.

6. I feel like close others are too interfering while they are trying to help me.

7. Close others don't seem to believe that I am capable of doing things myself, in my condition.

8. Close others tend to take over tasks I could do myself.

9. I focus on little else all day besides my pain.

Q10 Do you have any comments or recommendations regarding any of the survey questions above? e.g. readability of questions (do they make sense?), possible ambiguity or misinterpretations, suitability to 7-point response scale provided, general item relevance, or other comments...

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________________________________________________________________________________________
Appendix C - Piloted Item List Feedback Task

Section 4 continued...
The following text instructions and survey questions will be provided to participants undertaking the survey. Your comments on the instructions to participants, survey questions, and/or response scale are kindly requested. Please do not actually answer the survey items, only the feedback questions.

"Listed below are a number of statements about your level of activity with regard to your chronic pain. Please read each item and indicate how strongly you agree or disagree with the statement."

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Slightly Disagree</th>
<th>Neither Agree Nor Disagree</th>
<th>Slightly Agree</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
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<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
</tbody>
</table>

10. Close others try to stop me doing tasks because they think I will make my pain worse.
11. Close others who know about my pain make too much of a big deal about it.
12. Certain close others seem to prefer it when I am dependent on them.
13. Certain close others make it difficult to remain independent.
14. Even though I have pain, I would like close others to let me do more things on my own.
15. Close others encourage me to stay as active as possible.
16. Close others encourage me to function more independently.
17. Close others comment positively on occasions that I have shown improvement in my ability to perform painful tasks.

Q11 Do you have any comments or recommendations regarding any of the survey questions above? e.g. readability of questions (do they make sense?), possible ambiguity or misinterpretations, suitability to 7-point response scale provided, general item relevance, or other comments...

________________________________________________________________________
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________________________________________________________________________
Appendix C - Piloted Item List Feedback Task

Q12 Please feel free to add any additional comments regarding the survey.

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

End of Block: Items

Start of Block: Finalising survey

Thank you for your time and assistance with our study. Please submit your completed feedback by clicking on the forward arrow button below, to progress to the next page.

End of Block: Finalising survey
Chronic Pain Survey - EFA

Start of Block: Participant Information and Consent

Study Information

Dear Participant

You are invited to participate in a survey about thoughts, feelings, and behaviours experienced by people with chronic pain. This research is being conducted as part of a PhD study at Murdoch University in Western Australia.

Please note that in order to participate you must meet the following criteria:

- **Must be aged between 18 and 65 years**
- **Must have chronic pain, i.e. pain symptoms lasting longer than 3 months**
- **Your pain must be non-cancerous, and not due to any broken tissue, i.e. still-healing bones, immediate post-operative wound etc.**

Nature and purpose of the study

Social validation of a person’s pain experience may be an important factor to identify in relation to ongoing pain. The aim of this study is to design a comprehensive survey that measures the degree to which people feel in/validated in their experience of chronic pain. Such a pain-validation instrument may be beneficial for use by healthcare professionals in the early stages of a client’s pain-management therapy.

What the study will involve

If you decide to participate in this study, you will be asked to indicate your consent to participate by ticking the relevant box on the participant consent below. You are then asked to complete some demographic questions, followed by the survey questions. It is estimated that the survey will take about 20 - 30 minutes to complete.

Voluntary Participation and Withdrawal from the Study

Your participation in this study is entirely voluntary. You may withdraw or discontinue the survey at any time. If you feel that you are becoming distressed at any time during survey completion, you are advised to discontinue the survey.

If you are willing to participate in this study, please complete the participant consent and survey to follow. Thank you for your assistance with this research project.

This study has been approved by the Murdoch University Human Research Ethics Committee (Approval 2017/017). If you have any reservation or complaint about the ethical conduct of this research, and wish to talk with an independent person, you may contact Murdoch University’s Research Ethics Office (Tel. 08 9360 6677 (for overseas studies, +61 8 9360 6677) or e-mail ethics@murdoch.edu.au). Any issues you raise will be treated in confidence and investigated fully, and you will be informed of the outcome.
Appendix D – EFA Survey

Participant consent

I have read the Information letter about the nature and scope of this survey. I agree that by submitting the survey I give my consent for the results to be used in the research. I know that I may change my mind, withdraw my consent, and stop participating at any time; and acknowledge that once my survey has been submitted it may not be possible to withdraw my data.

I understand that all information provided is treated as confidential by the researchers and will not be released to a third party by the researchers unless required to do so by law. I understand that the findings of this study may be published and that no information which can specifically identify me will be published.

Q 1. Do you consent to take part in this survey?
   
   □ Yes, I consent to take part in this survey. I have had pain for longer than 3 months.
   
   □ No, I do not consent to take part in this survey.

Q2 Please enter your Prolific ID [Note: it can be found in your account information].

________________________________________________________________

Page Break

Q3 The following few questions ask you to provide some general demographic information, and information about your pain condition.

What is your age?

________________________________________________________________

Q4 What is your gender?

□ Male

□ Female

□ Other

________________________________________________________________
Appendix D – EFA Survey

Q5 Which types of healthcare providers have you seen about your pain condition? Select all that apply.

☐ None

☐ General Practitioner

☐ Physiotherapist

☐ Chiropractor

☐ Specialist doctor

☐ Acupuncturist

☐ Chinese medicine practitioner

☐ Naturopath

☐ Massage therapist

☐ Other. Please state

________________________________________________
Appendix D – EFA Survey

Q6 What type of professional is the MAIN healthcare professional who manages your pain condition?

- None
- General Practitioner
- Physiotherapist
- Chiropractor
- Specialist doctor
- Insurance doctor
- Chinese medicine practitioner
- Naturopath
- Massage therapist
- Other. Please state ________________________________

Q7 What type of pain condition do you have, according to the best of your healthcare provider's knowledge? Select all that apply.

- Back pain
- Neck pain
- Fibromyalgia
- Arthritis
- Headache/ Migraine
- Complex regional pain syndrome
- Cancer
Appendix D – EFA Survey

☐ Unknown

☐ Other. Please state

Q8 How long have you had your pain condition?

________________________________________________________________

Q9 How often do you have pain?

☐ Constantly, or near constantly

☐ Daily episodes of pain

☐ Most days of the week

☐ Several days per month

☐ Other __________________________________________________________

Q10. Please rate your pain using the slider bar below, to best describe your pain on average, on a typical day with pain. The bar slides from zero = no pain, up to 10 = pain as bad as you can imagine.

<table>
<thead>
<tr>
<th></th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pain level ()</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
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<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

Q11 Do you have any known psychological disorder or condition?

☐ No

☐ Yes. Please state. ________________________________________________

End of Block: Demographics
Q12. Listed below are a number of statements concerning your feelings about having chronic pain.

Please read each item and indicate how strongly you agree or disagree with the statement.

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Slightly Disagree</th>
<th>Neutral</th>
<th>Slightly Agree</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>I am caring toward myself when I have pain</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>I get impatient with myself about my pain condition.</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>I allow myself to feel pain without being self-critical.</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>I feel guilty talking about my pain condition.</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>I tend to ignore pain or illness symptoms and keep pushing through my day.</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>I should have found a way to get rid of my pain by now.</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
</tbody>
</table>
Appendix D – EFA Survey

My pain condition makes me feel abnormal.

Having pain is a sign of weakness.

I am ashamed of having a pain condition.

Having pain is a sign of poor character.

I don’t feel right talking about my pain because I know some other people have it worse than me.

I don’t talk about my pain because I don’t want to be a ‘whinger’.

I get angry at myself for having pain.

I feel like I am letting my partner and/or close family members down because my pain limits me.
I don’t feel like I am contributing enough at home, because of my pain.
I try to hide my pain because I don’t want everyone else to know.
I sometimes wonder if my pain is ‘all in my head’.
Having a pain condition makes me feel embarrassed.
Sometimes my pain makes me feel useless.
Having a pain condition makes me feel undesirable.
I feel like a burden to others because of my pain condition.
Q13. The following section contains a number of statements about your experiences of others important to you, with regard to your chronic pain. The phrase 'immediate others' in this section refers to those people with whom you spend the most time, such as your partner, housemate, or other people you live with. First, please indicate the relationship(s) which best describe those with whom you live and spend the most time i.e. 'immediate others'.

☐ Partner
☐ Housemate
☐ Parent
☐ Sibling
☐ Other. Please indicate type of relationship.

Q14
Please read each item and indicate how strongly you agree or disagree with the statement.

**Immediate others...**

<table>
<thead>
<tr>
<th></th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Slightly Disagree</th>
<th>Neutral</th>
<th>Slightly Agree</th>
<th>Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>...are very supportive of me in my pain condition.</td>
<td>☐️</td>
<td>☐️</td>
<td>☐️</td>
<td>☐️</td>
<td>☐️</td>
<td>☐️</td>
</tr>
<tr>
<td>...are generally sympathetic about my pain.</td>
<td>☐️</td>
<td>☐️</td>
<td>☐️</td>
<td>☐️</td>
<td>☐️</td>
<td>☐️</td>
</tr>
<tr>
<td>...don’t seem to believe that I have pain because I look well.</td>
<td>☐️</td>
<td>☐️</td>
<td>☐️</td>
<td>☐️</td>
<td>☐️</td>
<td>☐️</td>
</tr>
</tbody>
</table>
Appendix D – EFA Survey

...seem to get annoyed with me about my pain condition.

...who hear about my pain condition seem to think that I am being weak.

...tend to be intolerant of my pain condition.

...seem to think it is my own fault that I still have pain.

...seem disappointed in me because of my pain condition.

...are accepting of me in my pain condition.

...seem to think that I am exaggerating my pain symptoms.

...don’t really want to hear about my pain.

...do not seem to realize how hard it is for me to do normal daily activities.
Appendix D – EFA Survey

...seem to think that I use my pain condition to be lazy.

...say that I need to ‘toughen up’.

...make me feel guilty for having pain.

...don’t believe that my pain is real because there is no obvious evidence of it.

...seem to judge me negatively for having pain.
Q15. These additional items in this section refer to 'people in general' meaning friends and others in your community. Please read each item and indicate how strongly you agree or disagree with the statement.

<table>
<thead>
<tr>
<th>Strongly Disagree 1</th>
<th>Disagree 2</th>
<th>Slightly Disagree 3</th>
<th>Neutral 4</th>
<th>Slightly Agree 5</th>
<th>Agree 6</th>
<th>Strongly Agree 7</th>
</tr>
</thead>
<tbody>
<tr>
<td>People in general think I am faking pain symptoms to get financial benefits.</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td>People in general seem to think that I use my pain to get attention.</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td>People in general are surprised at how well I function with my pain condition.</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td>In terms of my pain, I feel well supported by people in general.</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td>I don’t feel like I can talk about my pain because people in general do not understand my condition.</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
</tr>
</tbody>
</table>
Appendix D – EFA Survey

People in general are sick of hearing about my pain.

I feel like I am being judged negatively by people in general, for taking pain medication.

In terms of my pain, people in general don’t seem to understand what I am going through.
Appendix D – EFA Survey

Q16. Listed below are a number of statements concerning experiences with your healthcare professional, with regard to your chronic pain. The phrase 'my healthcare professional' in this section refers to the main healthcare professional who is managing your pain condition. For example, this may be a GP, a specialist doctor, or a physiotherapist.

Please read each item and indicate how strongly you agree or disagree with the statement.

<table>
<thead>
<tr>
<th>My healthcare professional...</th>
<th>Strongly Disagree 1</th>
<th>Disagree 2</th>
<th>Slightly Disagree 3</th>
<th>Neutral 4</th>
<th>Slightly Agree 5</th>
<th>Agree 6</th>
<th>Strongly Agree 7</th>
</tr>
</thead>
<tbody>
<tr>
<td>... listens and tries to understand when I explain about my pain.</td>
<td>○</td>
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<tr>
<td>... seems to believe that I am doing my best to get rid of my pain.</td>
<td>○</td>
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<tr>
<td>... seems to think that my pain is my own fault.</td>
<td>○</td>
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<tr>
<td>... has indicated that many other people have similar symptoms to me.</td>
<td>○</td>
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<tr>
<td>... doesn’t believe that I have the amount of pain I describe, because I look too well.</td>
<td>○</td>
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<tr>
<td>Statement</td>
<td>Scale</td>
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<tr>
<td>... does not seem to really believe that I have a pain condition.</td>
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<tr>
<td>... talks to me about my pain condition as if it is not real.</td>
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<tr>
<td>... seems to think my pain is all psychological rather than physical.</td>
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<tr>
<td>... seems to judge me negatively when I ask for more pain medication.</td>
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<tr>
<td>... seems to genuinely care about my pain.</td>
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<tr>
<td>... doesn’t take me seriously when I talk about my pain.</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>... seems to think I am faking or exaggerating my symptoms.</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>... seems irritated with me for my ongoing pain.</td>
<td></td>
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</tr>
</tbody>
</table>
## Appendix D – EFA Survey

<p>| | | | | | | | |</p>
<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>...does not take the time to fully understand about my pain</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>condition.</td>
<td></td>
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<tr>
<td>...makes me feel guilty whenever I tell them about my pain.</td>
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<tr>
<td>...values my input when making decisions about my treatment</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>plan.</td>
<td></td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>...takes my preferences into account when deciding on a treatment plan.</td>
<td></td>
<td></td>
<td></td>
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<td></td>
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<td></td>
</tr>
</tbody>
</table>
Appendix D – EFA Survey

Q17. Listed below are a number of statements about your level of activity with regard to your chronic pain. The phrase *immediate others* in this section refers to those people with whom you spend the most time, such as your partner, housemate, or other people you live with.

Please read each item and indicate how strongly you agree or disagree with the statement.

*Immediate others...*

<table>
<thead>
<tr>
<th>Strongly Disagree 1</th>
<th>Disagree 2</th>
<th>Slightly Disagree 3</th>
<th>Neutral 4</th>
<th>Slightly Agree 5</th>
<th>Agree 6</th>
<th>Strongly Agree 7</th>
</tr>
</thead>
<tbody>
<tr>
<td>...who know about my pain make too much of a big deal about it.</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td>...assume I cannot do tasks that I am capable of.</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td>...encourage me to rest and not to push myself.</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td>...are too interfering while they are trying to help me.</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td>...encourage me to function more independently.</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td>...tend to take over tasks that I could do myself.</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
</tr>
</tbody>
</table>
...try to stop me doing tasks because they think it will make my pain worse.

...do most physical tasks for me.

...seem to prefer it when I am dependent on them.

...make it difficult for me to remain independent.

...comment positively on occasions that I have shown improvement in my ability to perform painful tasks.

...don't seem to believe that I am capable of doing things myself, in my condition.

...encourage me to stay as active as possible.

Even though I have pain, I would like immediate others to let me do more things on my own.
Appendix D – EFA Survey

I don’t want to do anything physical because I am scared of making my pain worse.

I focus on little else all day besides my pain.

---

Q18. Using the slider bar below, please rate how emotionally close you feel to the person(s) whom you thought of as 'immediate others' in this survey. The bar slides from zero = Not close at all, up to 10 = Extremely close.

Emotional Closeness to 'Immediate Others' ()

---

Q19. Please feel free to add any additional comments regarding any particular survey questions, instructions, or the survey overall.

________________________________________________________________
________________________________________________________________
________________________________________________________________
________________________________________________________________

---

Q20. Thank you for your time and assistance with our study. Please submit your completed survey by clicking on the forward arrow button below, to progress to the next page.

End of Block: Finalising survey
Appendix E – Pain-Validation Scale

Pain-Validation Scale

Notes for Researchers

The 24-item Pain-Validation Scale contains 4 subscales:

Invalidation by the Self
Invalidation by Immediate Others
Invalidation by Healthcare Professionals
Over-validation

Each subscale is comprised of 6 items.

All items are to be answered on a Likert-type response scale:

1 = “Strongly Disagree”; 2 = “Disagree”; 3 = “Slightly Disagree”; 4 = “Neutral”; 5 = “Slightly Agree”; 6 = “Agree”; and 7 = “Strongly Agree”

There are no reverse-scored items.

The first 3 subscales are designed to measure invalidation of pain. The fourth subscale is designed to measure over-validation of pain. The range of scores possible for each item is 1 – 7. There are 6 items per subscale, therefore the minimum possible subscale score is 6, and the maximum possible subscale score is 42. The P-VS subscales should not be summed, rather each subscale should be assessed separately. Higher scores on the first 3 subscales indicate higher levels of pain invalidation in the respective domain. Higher scores on the last subscale indicate higher levels of over-validation.
Appendix E – Pain-Validation Scale

Listed below are a number of statements concerning your feelings about having chronic pain. Please read each item and indicate how strongly you agree or disagree with the statement.

1. My pain condition makes me feel abnormal.
2. I feel like I am letting my partner and/or close family members down because my pain limits me.
3. I don’t feel like I am contributing enough at home, because of my pain.
4. Sometimes my pain makes me feel useless.
5. Having a pain condition makes me feel undesirable.
6. I feel like a burden to others because of my pain condition.

The following section contains a number of statements about your experiences of others important to you, with regard to your chronic pain. The phrase ‘immediate others’ in this section refers to those people with whom you spend the most time, such as your partner, housemate, or other people you live with.

First, please indicate the relationship(s) which best describe those with whom you live and spend the most time i.e. ‘immediate others’.

- Partner
- Housemate
- Parent
- Sibling
- Other. Please indicate type of relationship

Please read each item and indicate how strongly you agree or disagree with the statement.

Immediate others…

7. …seem to get annoyed with me about my pain condition.
8. …who hear about my pain condition seem to think that I am being weak.
9. …seem to think that I am exaggerating my pain symptoms.
10. …say that I need to ‘toughen up’.
11. …make me feel guilty for having pain.
12. …don’t believe that my pain is real because there is no obvious evidence of it.
Appendix E – Pain-Validation Scale

Listed below are a number of statements concerning experiences with your healthcare professional, with regard to your chronic pain. The phrase ‘my healthcare professional’ in this section refers to the main healthcare professional who is managing your pain condition. For example, this may be a GP, a specialist doctor, or a physiotherapist. Please read each item and indicate how strongly you agree or disagree with the statement.

My healthcare professional…

13. …doesn’t believe that I have the amount of pain I describe, because I look too well.
14. …talks to me about my pain condition as if it is not real.
15. …seems to think my pain is all psychological rather than physical.
16. …seems to judge me negatively when I ask for more pain medication.
17. …seems to think I am faking or exaggerating my symptoms.
18. …makes me feel guilty whenever I tell them about my pain.

Listed below are a number of statements about your level of activity with regard to your chronic pain. The phrase ‘immediate others’ in this section refers to those people with whom you spend the most time, such as your partner, housemate, or other people you live with. Please read each item and indicate how strongly you agree or disagree with the statement.

Immediate others…

19. …who know about my pain make too much of a big deal out of it.
20. …assume I cannot do tasks that I am capable of.
21. …are too interfering while they are trying to help me.
22. …tend to take over tasks that I could do myself.
23. …make it difficult for me to remain independent.
24. …don’t seem to believe that I am capable of doing things myself, in my condition.
# Appendix F – Pain-Validation Scale Scoring Averages

<table>
<thead>
<tr>
<th></th>
<th>Invalidation by the Self</th>
<th>Invalidation by Immediate Others</th>
<th>Invalidation by Healthcare Providers</th>
<th>Over-validation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$n$</td>
<td>Mean</td>
<td>SD</td>
<td>Mean</td>
</tr>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>122</td>
<td>25.69</td>
<td>9.13</td>
<td>17.71</td>
</tr>
<tr>
<td>Female</td>
<td>184</td>
<td>29</td>
<td>8.84</td>
<td>17.1</td>
</tr>
<tr>
<td>Other</td>
<td>2</td>
<td>23.5</td>
<td>24.75</td>
<td>11.5</td>
</tr>
<tr>
<td><strong>Age</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18 - 25 years</td>
<td>52</td>
<td>25.71</td>
<td>10.14</td>
<td>17.92</td>
</tr>
<tr>
<td>36 - 45 years</td>
<td>77</td>
<td>28.08</td>
<td>8.55</td>
<td>17.68</td>
</tr>
<tr>
<td>46 - 55 years</td>
<td>57</td>
<td>30.28</td>
<td>9.3</td>
<td>19.16</td>
</tr>
<tr>
<td>56 - 65 years</td>
<td>24</td>
<td>27.12</td>
<td>8.92</td>
<td>15.54</td>
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<tr>
<td><strong>Pain condition</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Back pain</td>
<td>156</td>
<td>27.47</td>
<td>9.23</td>
<td>17.91</td>
</tr>
<tr>
<td>Headache</td>
<td>83</td>
<td>31.12</td>
<td>7.43</td>
<td>19.01</td>
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<tr>
<td>Neck pain</td>
<td>60</td>
<td>29.18</td>
<td>8.15</td>
<td>18.65</td>
</tr>
<tr>
<td>Arthritis</td>
<td>45</td>
<td>28.76</td>
<td>9.23</td>
<td>17.24</td>
</tr>
<tr>
<td>Fibromyalgia</td>
<td>21</td>
<td>36.9</td>
<td>5.76</td>
<td>15.81</td>
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<tr>
<td>Abdominal pain</td>
<td>15</td>
<td>32.67</td>
<td>8.12</td>
<td>15.6</td>
</tr>
</tbody>
</table>