The Chronic Illness Acceptance Questionnaire: Confirmatory Factor Analysis and Prediction of Perceived Disability in an Online Chronic Illness Support Group Sample

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Chronic illnesses and health conditions in the US are among the most frequently diagnosed illnesses and, inarguably, among the most costly in the health care system. In fact, some have been estimated to account for as much as 78% of total U.S. health care costs, and much of this cost is related to increased health care utilization in this population (Anderson & Horvath, 2004). As of 2005, 133 million, or almost 1 in every 2, Americans had at least one chronic illness such as heart disease, cancer, or diabetes (Wu & Green, 2000). The direct and indirect costs of these health care problems continue to rise even amid the implementation of myriad behavioral and self-management programs.

Empirically supported behavioral/cognitive behavioral assessments and interventions have been utilized in management of chronic illness and pain with modest-to-good outcomes. Nonetheless, there is considerable room for improvement in assessment and treatment of these pervasive problems in both specialty and primary health care and community settings (Starfield, et al, 2003). There has been an increased focus on outcomes that extend beyond symptom reduction (e.g., depression) and toward enhanced functional outcomes across a variety of domains in patients with chronic illnesses and conditions (McCracken, 2011).

Perceived Disability
Perceived disability is a measure of the degree to which an individual sees himself or herself as being disabled as a result of his or her illness or symptoms related to a chronic condition (Pollard, 1981). The construct has been studied extensively in relation to chronic pain with increased levels of perceived disability associated with higher ratings of pain (i.e., symptom) intensity (Arnstein et al., 1999). Disability is a critical component of patient functioning. In chronic illness management the central focus of treatment intervention is to improve function in life domains, and not disease or symptom abatement. In other words, there is greater emphasis on ways in which patients feel they are disabled as a result of their condition or symptoms because feeling disabled appears to be more related to functioning than the simple presence or absence of symptoms (World Health Organization, 2013).

Previous research with chronic pain patients found that patients perceived themselves as having “significant impairment in physical, psychosocial, and work and recreational activities” (Smith and Ahern, 1985, p. 74), including disability related to home management, social interaction, emotional behavior, and sleep. Alschuler, Theisen-Goodvich, Haig, and Geisser (2008) found that higher rating of pain intensity was associated with greater perceived disability, but not objectively rated disability as measured by a physical performance test. Depression and perceived disability have been associated with functional outcomes. Lofland et al. (1997) found that decreased depression and perceived disability predicted improvement in activity level and overall function. Specifically, lower perceived disability was related to higher standardized functional capacity tests (e.g., measures of physical strength and range of motion), as well as increased daily activity.

In recent studies, perceived disability has been defined as a “proxy” for functional outcomes in a chronic pain support group sample. For example, Herbst, Beacham, Payne-
Murphy, Crafton, and Katsikas (2010) examined the role of acceptance of pain and mindfulness in ratings of perceived pain-related disability in an online chronic pain support group sample. In this study, increased acceptance was negatively associated with perceived disability. In the same sample, Lillis et al. (2010) found that higher perceived disability was associated with higher subjective ratings of sleep quality. In these analyses, authors controlled for pain severity ratings, age, education and number of previous pain related surgeries. It is also noteworthy that, in these analyses, negative affect did not account for a significant amount of variance in the prediction of perceived disability.

Positive and Negative Affect

Watson, Clark and Tellegen (1988) conceptualize Negative affect (NA) and Positive affect (PA) as orthogonal constructs. That is, if one endorses high levels of NA, they would not consequently be low on PA and vice versa. One may simultaneously score high (or low) on both PA and NA. Negative affect is comprised of “a variety of aversive mood states including anger, contempt, disgust, guilt, fear, and nervousness” whereas positive affect includes “the extent to which a person feels enthusiastic, active and alert” (Watson, Clark & Tellegen, 1988 p. 1063). In chronic pain populations, both PA and NA have been shown to be related to improvement or exacerbation of pain symptoms (Smith & Zautra, 2002; Zautra, Smith, Affleck & Tennen, 2001). The combination of high NA and low PA has also been found to be correlated with increased functional disability in patients with rheumatoid arthritis. Those who display more functional disability tend to exhibit a combination of high NA and low PA. In these studies, authors note that those with higher PA tend to use more adaptive and less maladaptive coping (e.g., catastrophizing). Strand, Zautra, Thoresen, Odegar, Uhlig, & Finset (2006) suggest that PA may, in fact, moderate the effect of NA on pain.
Positive and negative affect have also been found to play a role in the perception of mental and physical health and treatment of patients with other chronic illnesses. Specifically, positive affect has been found to be positively associated with mental and physical health-related quality of life (Hu & Gruber, 2008; Stauber et al., 2012). High negative affect is associated with poor self-reported health status in patients with coronary heart disease (Versteeg et al., 2009). This combination of high positive and low negative affect has been associated with lower symptom distress, lower depressive symptomatology and higher levels of quality of life in patients with chronic illnesses (Hu & Gruger, 2008). In general positive affect seems to play a protective role for overall health status as it has been found to moderate the detrimental effects of negative affect in some patients with coronary artery disease (Versteeg et al., 2009).

**Acceptance and Mindfulness**

Acceptance and mindfulness based interventions (e.g., Acceptance and Commitment Therapy; ACT) have shown considerable promise in chronic pain populations (McCracken, Vowles & Eccleston, 2004, 2005; Vowles, McCracken & Eccleston, 2008 McCracken, Vowles & Zhao-O’Brien, 2010). Within an ACT approach, the overarching goal is to increase “psychological flexibility,” thus fostering adaptive responding across different contexts. In essence, persons with higher levels of flexibility are more adept at adapting to myriad internal and external cues, resulting in the ability to live a valued life even in the face of pain, illness and other difficulties. One important core process related to the development of psychological flexibility is Acceptance. For a more extensive review of ACT theory and core processes see Hayes, Strosahl, & Wilson, 1999, 2012.
Acceptance. The construct of acceptance has its origins in experiential avoidance. Experiential avoidance is “the phenomenon that occurs when a person is unwilling to remain in contact with particular private experiences (e.g., bodily sensations, emotions, thoughts, memories, behavioral predispositions) and takes steps to alter the form or frequency of these events and the contexts that occasion them” (Hayes, Wilson, Gifford, Follette, & Strosahl, 1996, p. 1155). Experiential avoidance is considered to be conceptually opposite to the process of acceptance.

In chronic pain populations, Acceptance has been shown to be comprised of two factors: Activity Engagement (a commitment to engaging in valued activities even in the face of illness related symptoms; AE) and Willingness (a willingness to experience sometimes painful or aversive symptoms if it means being able to participate in valued life activities; W). Both facets of Acceptance are considered key processes in the development of psychological flexibility (McCracken, 2010).

Acceptance in chronic pain patients, or, the “willingness to experience pain without attempting to reduce or avoid it,” has been most commonly assessed with the Chronic Pain Acceptance Questionnaire (CPAQ; Vowles, McCracken, McLeod, & Eccleston, 2008). Overall, chronic pain Acceptance and AE and W factors of the CPAQ, have been shown to be strongly associated with key predictors of outcomes in chronic pain patients, including perceived disability, physical, social and emotional functioning (McCracken & Velleman, 2010; McCracken, Vowles, & Zhao-Obrien, 2010), positive and negative affectivity (Payne-Murphy & Beacham, 2013), anxiety sensitivity (Asmundson, Norton, & Norton, 1999; ), experiential avoidance (Vowles, McCracken, McLeod, & Eccleston, 2008), and mindfulness (McCracken & Velleman, 2010). Acceptance has, likewise, been identified as playing a key role in positive
outcome in patients with other chronic illnesses and conditions and the modification of
associated risk factors including diabetes (Gregg, Callahan, Hayes, & Glenn-Lawson, 2007 ),
obesity (Lillis, Hayes, Bunting, & Masuda, 2009), and smoking cessation (Gifford, Kohlenberg,

Comorbid Chronic Illness Presentations

In medical settings, patients don’t typically present for treatment with one single,
predominant chronic illness condition. Rather, most patients present to health care practitioners
with multiple medical comorbidities and a constellation of behaviorally linked illness risk factors
(Grumbach, 2003). Notably, approximately a decade ago an estimated 63 million persons in the
US had more than one chronic illness (Wu & Green, 2000). Starfield and colleagues (2003)
studied ambulatory care visit patterns and found that patients seek care for all of their conditions,
not just for a solitary condition. In fact, visits for comorbidities outnumber visits for any single
condition. Moreover, with the exception of patients with relatively uncommon conditions, the
majority of visits for care of both an indicator condition and its associated comorbidities are
made to primary care physicians, not specialists. For example, a patient with Type 2 diabetes
may also have diagnosed hypertension, cardiovascular disease, and obesity with a sedentary
lifestyle and a host of dietary factors – all of which are inextricably connected with each singular
diagnosis. Logically, patients seen in the health care system are seeking help from their providers
for treatment of the whole experience of their illness(es).

Patients presenting for care and management of multiple chronic illness conditions and
symptoms have a more intricate presentation, and hence, care of the whole person likewise
becomes more interconnected and complex. Specialist treatment trends within medicine have
been likened to those within the automotive industry in the “fractioning” of automotive repair shops into “engine, transmission, and exhaust system specialists” (Grumbach, 2003, p. 4). Disease or symptom specific approaches (e.g., programs with one target such as diabetes, pain, asthma) to patient care and the identification of meaningful outcomes may prove to be too reductionistic and inadequate in patient-centered care. The dilemma for behavioral health providers treating these patients often becomes whether to similarly parse out assessment and intervention to smaller singular targets (e.g., chronic pain, diabetes) or to assess and intervene within the patient experience as a whole – that is, the total experience of myriad illness related symptoms simultaneously.

Given the behavioral and psychosocial links to many chronic illnesses and related symptoms, behavioral professionals in health care systems similarly face challenges in providing whole person assessment and intervention. To this end, it is necessary, but not sufficient, to measure psychological symptom reduction (e.g., depression) as a singular meaningful treatment outcome. Rather, functional impairment/status of patients across many life domains should be considered an overarching primary outcome for chronic illness management.

**Purpose of the Present Study**

Given the commonalities of ongoing behavioral management of chronic pain and common chronic illness conditions, we adapted the Chronic Pain Acceptance Questionnaire (CPAQ) to form a Chronic Illness Acceptance Questionnaire (CIAQ). The CIAQ is designed to examine the role of acceptance in populations with more diverse and heterogeneous chronic illness diagnoses. The purpose of this study was to more fully explore the characteristics of the CIAQ in a chronic illness population and with multiple medical co-morbidities recruited from
online chronic illness support groups. Moreover, we wished to examine the predictive role of chronic illness acceptance and other key predictors in perceived illness related disability.

Methods

Participants and Procedures

Study participants were recruited through online chronic illness support groups. Online venues were Yahoo! illness specific support groups. The inclusion criteria included the following: (a) being 18 years of age or older; (b) speaking English, and (c) having chronic, non-malignant pain for at least three months. The groups targeted were those which the stated mission was to offer support for persons who self-identify as having been diagnosed with a chronic illness (e.g., diabetes, CVD, COPD, Fibromyalgia) or symptoms (e.g., pain such as chronic pelvic pain). In all, a total of 296 groups with a total of 176,243 members were contacted and 73 groups with a total of 41,957 members granted permission to post the invitation to participate in the survey. Support groups with the following focus areas were excluded: (a) 12 step groups; (b) biofeedback; (c) intervention-based; (d) spiritually oriented; (e) medication focused (e.g., Opioid, Oxy-Contin); (d) malignant pain (cancer); (d) litigious groups. Study participants completed an online survey through SurveyMonkey that included demographic and medical history questions and a series of self-report questionnaires.

Study Sample

The study sample \((N = 413)\) ranged in age from 20-84 years \([\text{Mean age} = 53.18 (12.39)]\) and was primarily Caucasian (90%), female (80.1%), highly educated [15.34 years \((SD=2.74)]\), and insured with most (42.2%) having private insurance or Medicare (34.1%). Participants in our sample reported being diagnosed with between 1-7 chronic illnesses and an average of 2.36 \((SD\)
chronic illnesses. The endorsement rates of chronic illness(es) in order of frequency were: chronic pain (40.8%), arthritis (36.8%), hypertension (27.6%), asthma (22.1%), diabetes (Type 1 or 2; 18.3%), COPD (17.6%), fibromyalgia (15.4%), multiple sclerosis (13.2%) and heart disease (12.0%).

Measures

**Demographic and medical history questions.** Participants completed questions related to demographic characteristics including age, gender, employment status, income level and years of education. Participants were also asked specific questions related to chronic pain such as the location of the pain, circumstances under which the pain began, and total number of surgeries.

**Chronic Illness Acceptance Questionnaire.** The Chronic Illness Acceptance Questionnaire (CIAQ; Beacham, Kinman, & Herbst, 2012) was adapted from the Chronic Pain Acceptance Questionnaire (CPAQ) and items were rated on a 0 (never true) to 6 (always true) scale. The CPAQ and CIAQ both yield two subscale scores: Activity Engagement and Pain Willingness (McCracken, Vowles, & Eccleston, 2004). Notably, all CPAQ items were retained in the development of the CIAQ. Subscale internal consistencies for this sample are: Activity Engagement Chronbach’s $\alpha = 0.88$ and Willingness Chronbach’s $\alpha = 0.75$. The CIAQ items, means and standard deviations are presented in Table 1.

**Perceived Illness Disability Index.** The Perceived Illness Disability Index (PIDI) was adapted from the Pain Disability Index (Pollard, 1984). The PIDI instructs respondents to rate the degree to which they feel they are disabled as a result of the symptoms of their chronic illness. Similar to the Pain Disability Index, the PIDI assesses illness-related disability in the following areas of function: family/home responsibilities, recreation, social activities, occupation, sexual
behavior, self-care, and life-support activity. All seven items are rated on a 0 (no disability) to 10 (total disability) scale. Items are summed to derive a total disability score.

**Positive and Negative Affect Schedule.** The Positive and Negative Affect Schedule (PANAS) Scales is a 20-item self-report measure of positive and negative affect (Watson, Clark, & Tellegen, 1988) that have frequently been utilized to measure positive and negative affect in studies examining chronic pain. The positive and negative affect scales are considered to be orthogonal, and are measured independently. Scales vary from high to low levels. Each scale item is a mood state adjective (i.e. “distressed”) and is rated on a scale of 1 (very slightly or not all) to 5 (extremely). The negative items are summed to provide a resultant total score for negative affect and the positive items are summed to provide a resultant total score for positive affect.

**Acceptance and Action Questionnaire–II.** The Acceptance and Action Questionnaire–II (AAQ-II) is a 7-item self-report measure of psychological inflexibility or experiential avoidance (Bond et al., 2011). Each item is rated on a 7-point Likert scale from 1 (never true) to 7 (always true) with higher scores indicating greater levels of psychological inflexibility. Initial psychometric evaluations of the AAQ-II demonstrated a mean alpha coefficient of .84 (.78 -.88). The AAQ-II significantly correlates with the AAQ-I ($r = .97$) and the three and 12 month test-retest reliability of the AAQ-II is .81 and .79, respectively.

**Mindfulness Awareness and Attention Scale (MAAS).** The MAAS is a 15-item scale designed to assess a core characteristic of dispositional mindfulness, namely, open or receptive awareness of and attention to what is taking place in the present (Brown & Ryan, 2003). Items
are rated on a 6-point scale from 1 (almost always) to 6 (almost never). The total score is the average of all items with higher scores being indicative of greater levels of mindfulness.

**Results**

**Confirmatory Factor Analysis**

Mean CIAQ item scores and standard deviations are presented by CIAQ Subscale/Factor in Table 1. Given the two factor solution identified with the CPAQ by Vowles et al (2008), we conducted Confirmatory Factor Analysis (CFA) to examine the parallel two factor solution in our chronic illness sample. The two factor CFA solution was tested with Structural Equation Modeling using AMOS software version 20. The data set contained some missing values which resulted in a total final sample size of $N = 362$. Overall, results showed adequate-to-good fit to the data. Several fit indices were examined to evaluate the adequacy of model fit. One criterion for a “good” fit, following Vowles, et al. (2008), is observed chi square divided by degrees of freedom equal to 2.0 or less. In this sample, the value was 3.60 ($\chi^2 = 608.7$, $df = 169$) which approached meeting the 2.0 criterion. Additional fit indices ranged from adequate-to-good. The Goodness of Fit Index (GFI) = .857, Adjusted Goodness of Fit Index (AGFI) = .823 which adjusts for sample size, Comparative Fit Index (CFI) = .84 and root mean square error of approximation (RMSEA) = .080. [90% CI = 0.61 - .073].

**Bivariate Correlations**

All CIAQ subscales were significantly correlated with other measures frequently associated with medical and functional outcomes in chronic pain and chronic illness populations. Absolute values (i.e., strength of associations) of Pearson $r$s with other outcomes measures ranged from .141 to .617 (all $p$s < .01; two-tailed). Both CIAQ subscale scores – Activity
Engagement and Willingness – were positively associated with positive affect, mindfulness and negatively associated with perceived disability, and experiential avoidance. See Table 2.

**Predictors of Perceived Illness Disability**

Stepwise multiple regression was conducted to ascertain the most salient predictors of perceived illness disability. With the PIDI total score as the dependent variable, the following predictor variables were entered into the equation: age, years of education, PANAS positive affect, PANAS negative affect, AAQ, MAAS, and CIAQ subscales. With PIDI total score as the dependent variable and the following predictor variables age, years of education, PANAS positive affect scale, PANAS Negative affect scale, MAAS, AAQ and CIAQ, the final model accounted for approximately 1/3 of total variance \([F(2, 269) = 69.892, R^2_{adj} = .337, p < .001]\). In the final model only CIAQ Activity Engagement \((\beta = -.484, t = -9.177, p < .001)\) and Willingness \((\beta = -.202, t = -3.83, p < .001)\) were retained.

Subsequently, a series of stepwise regressions were conducted to ascertain the most salient predictors of each of the constituent items (i.e., life domains) of the PIDI. In order to control for experiment wise error related to the number of analyses performed, a Bonferroni correction \((.05 \div 8)\) was applied. This yielded a criterion value of \(p = .00625\). When each of the PIDI items were defined as dependent variables with predictor (independent) variables (age, years of education, PANAS positive affect, PANAS negative affect, AAQ, MAAS, and CIAQ subscales) entered into the regressions, overall results were similar with variance accounted for ranging from .104 to .322 (all \(ps < .001\)). Results for each of the models are presented in Table 3.

**Discussion**
The identification of predictors of medical and functional outcome in patients with chronic illness and conditions can inform the development of effective and tailored behavioral interventions for the improved self-management. Previous findings with chronic pain populations using acceptance-based approaches have shown promise. The CPAQ has been a valid and reliable measure with strong psychometric properties in assessing chronic pain specific acceptance on both the Activity Engagement and Willingness subscales (Vowles & McCracken, 2008; Fish, McGuire, Hogan, Morrison & Stewart, 2010). To our knowledge, however, there is not an existing corollary measure of acceptance in chronic illness populations more broadly defined. This is especially true for clinical populations comprised of those patients diagnosed with more than one chronic illness or condition.

In this sample of online chronic illness support group members, the CIAQ yielded quite similar results to analysis of the CPAQ both in terms of factor structure and associations with other predictors of outcome. The CIAQ items that load on each of the factors are similar in strength and nearly identical in factor “membership”. The “weakest” of the items was item 10 (Controlling my illness is less important than any other goals in my life), which is a finding nearly identical to that of previous factor analyses and evaluations of the CPAQ (Vowles & McCracken, 2008; Fish, McGuire, Hogan, Morrison & Stewart, 2010).

Certainly, the knowledge that the CIAQ possesses many of the same factor and item characteristics as its predecessor, the CPAQ, is an important and useful finding. It is the role that chronic illness acceptance plays in prediction of functional outcome lies at the heart of the question we wish to address. When we analyzed the two CIAQ factors with demographic variables and common outcome indicators in chronic pain and illness, the correlations were strong and in hypothesized directions. In our sample, age was positively associated with
mindfulness, positive affect, and activity engagement subscale scores of the CIAQ and
negatively associated with negative affect and total perceived illness disability scores but not
significantly. Education was positively associated with positive affect and, both, activity
engagement and willingness subscales of the CIAQ. Mindfulness, positive and negative affect,
and acceptance subscales were likewise intercorrelated in hypothesized directions. That is,
relative to outcomes, “positive attributes” tended to correlate positively with “positive attributes”
and vice versa.

When we examined predictive relationships more closely with perceived illness disability
as the dependent variable, only the two CIAQ factors – Activity Engagement and Willingness -
were retained in regression equations. This finding is consistent with other results of analyses
with chronic pain and illness samples in our smaller scale studies and analyses (Herbst,
Beacham, Payne-Murphy, Crafton, & Katsikas, 2010; Payne-Murphy & Beacham, 2013). In our
experience, the two acceptance factors have been consistently robust when examined relative to
patients’ perceived disability. The same was true when we examined the individual components
of the PIDI. In all but two domains, only the CIAQ Activity Engagement and Willingness were
retained in final regression models predicting perceived disability in specific life domains. In the
Life Support domain, Activity Engagement (not Willingness) and age were retained in the
model. In prediction of Social Activity, Activity Engagement and Willingness were retained with
the notable retention of positive – but not negative – affect in that same analysis.

Findings in the present study that may seem surprising, but were, in fact, consistent with
our previous research findings with chronic pain and illness samples are the frequency with
which negative affect and mindfulness were not identified as key (i.e., significant) predictors of
perceived disability (Herbst, Beacham, Payne-Murphy, Crafton, & Katsikas, 2010; Payne-
Murphy & Beacham, 2013). Additionally, and equally surprising, is the consistent finding that NA has not played a role in prediction of perceived disability in these samples. These findings introduce questions regarding the use of measures of negative affectivity such as depression and anxiety as sole or primary measures of outcome. While these variables may well be associated with poorer outcome, it is possible that there are factors that have a more impactful role. In previous work with both positive and negative affect it is noteworthy that NA has been associated with symptom exacerbation. It remains to be seen whether PA may serve to moderate these effects. Given that we did not test for moderation in these analyses, it opens the door for further investigation regarding the potential roles of these constructs relative to one another. Certainly, a reduced focus on NA – especially depression - as a treatment target may be contrary to commonly held belief for psychosocial and behavioral treatment of chronic pain and illness.

Over the past decade, mindfulness has been heralded as a promising basis of or target for clinical treatment intervention. Mindfulness has been shown to be an important variable in treatment of chronic pain (Sephton et al., 2007), anxiety (Roemer & Orsillo, 2012) and depression (Segal, Williams & Teasdale, 2002). In the present study sample, mindfulness was not retained in any of the regressions predicting total perceived illness-related disability. Albeit surprising to us, this finding is consistent with our previous studies in chronic pain and illness samples.

On the one hand, it may be assumed that mindfulness is not as important a factor in perceived disability as has been posed. On the other hand, these findings may lend credence to two other hypotheses. First, there is ongoing debate about the nature of mindfulness as a construct and how to adequately measure and conceptualize it. The actual way of defining and operationalizing “mindfulness” has, likewise, posed considerable challenges to researchers and
practitioners. Grossman (2011) offers discussion and commentary about westernized definitions of mindfulness. He suggests that western definitions deviate considerably from those of the Buddhist tradition. He also emphasizes shortcomings of commonly used measures as gleaning something markedly different than the intended construct. He specifically describes items on the MAAS (which was utilized in the present study) as potentially assessing a “very different kind of paying attention, marked by low levels of patience, tolerance and kindness” (p. 1035). Relative to the second hypothesis, Rosensweig (2013) suggests that mindfulness is one of many “sisters” of interconnected constructs including compassion, acceptance, forgiveness, gratitude, loving kindness, and best-self visualization. Of these she describes acceptance as being inextricably connected to the process of mindfulness. In this study, one possibility is that acceptance and mindfulness are overlapping constructs. It is conceivable, therefore, that when we consider the role of acceptance and mindfulness relative to other outcomes, one may at least partially mediate the other. Taken together, these points underscore the importance and impact of mindfulness as a construct. These authors’ discussions also emphasize how we will benefit from further work in this area.

**Study Limitations**

Some pertinent study limitations warrant further discussion. In this study, we utilized an internet-based support group sample of self-identified chronic illness sufferers. It may be argued that such a sample could differ from clinical samples and, hence, limit the generalizability of our findings. However, given that it is estimated that over 70% of the population goes to the internet for their medical information (Taylor, 2011), data from both types of samples may offer appreciable generalizability (see also Fish et al, 2010). Notably, in another recent study, we
compared internet sample characteristics to clinical samples on similar constructs and found little
difference between the two (Payne-Murphy & Beacham, 2013).

We measured negative affect, but not depression per se, in our study sample. According
to Watson, Clark and Tellegen (1988), NA includes “a variety of aversive mood states including
anger, contempt, disgust, guilt, fear, and nervousness” (p. 1063.) It has been suggested that high
NA and low PA best characterize depressive symptomatology, as that combination has been
associated with Beck Depression Inventory scores (Jolly, Dyck, Kramer, & Wherry, 1994;
Watson, Clark & Carey, 1988; Watson, Clark & Tellegen, 1988). Taken a step further, NA as
assessed with the PANAS may more holistically and accurately capture the aversive aspects of
chronic illness experience than would a single measure of depression or anxiety.

Beyond our initial stated purpose of this study to perform confirmatory factor analysis
with the CIAQ, another explicit goal of this study was to more closely examine the role of
Acceptance as it relates to perceived disability. Although we assessed the role of Acceptance in
concert with mindfulness, it is necessary to acknowledge that this approach may be
reductionistic. Mindfulness and Acceptance are two of the six core interrelated processes
comprising the theoretical underpinning of ACT. In a recent commentary, McCracken (2013)
cautions that “Different models are not simply differing sets of variables.” (p.136). McCracken’s
point is excellent, and no one component of the model should be viewed as more important than
another part of the interrelated whole of the model. As such, it may be limiting to view these
results outside of the overarching context and purpose: to enhance psychological flexibility.

These points have merit, and, from a clinical perspective, if we have additional information that
enables us to create a more specific idiographic conceptualization, then clinical interventions and
treatment can be more targeted and effective. To this end, there may be tremendous utility in the
development of normative data and “cut-offs” to assist in informative assessment,
conceptualization, and treatment, resulting in improved functional outcomes in patients who
suffer from chronic illnesses.
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Table 1  
*CIAQ Item Loadings with CPAQ Comparison when Extracting 2 Factors*

<table>
<thead>
<tr>
<th>Item Description</th>
<th>CPAQ</th>
<th>CIAQ</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>AE</strong></td>
<td><strong>PW</strong></td>
<td><strong>AE</strong></td>
</tr>
<tr>
<td>9: I lead a full life despite having an illness.</td>
<td>x</td>
<td>0.82</td>
</tr>
<tr>
<td>6: Although things have changed, I am living a normal life despite my illness.</td>
<td>x</td>
<td>0.81</td>
</tr>
<tr>
<td>2: My life is going well, even though I have my illness.</td>
<td>x</td>
<td>0.80</td>
</tr>
<tr>
<td>12: Despite my illness, I am now sticking to a certain course in my life.</td>
<td>x</td>
<td>0.77</td>
</tr>
<tr>
<td>1: I am getting on with the business of living no matter how bad my illness is.</td>
<td>x</td>
<td>0.71</td>
</tr>
<tr>
<td>19: It’s a relief to realize that I don’t have to change my illness to get on with my life.</td>
<td>x</td>
<td>0.70</td>
</tr>
<tr>
<td>15: When the symptoms of my illness increase, I can still take care of my responsibilities.</td>
<td>x</td>
<td>0.69</td>
</tr>
<tr>
<td>3: It’s OK to experience symptoms related to my illness.</td>
<td>x</td>
<td>0.61</td>
</tr>
<tr>
<td>8: There are many activities I do when I experience symptoms of my illness.</td>
<td>x</td>
<td>0.56</td>
</tr>
<tr>
<td>5: It’s not necessary for me to control my illness in order to handle my life well.</td>
<td>x</td>
<td>0.42</td>
</tr>
<tr>
<td>10: Controlling my illness is less important than any other goals in my life.</td>
<td>x</td>
<td>0.39</td>
</tr>
<tr>
<td>14: Before I can make any serious plans, I have to get some control over my illness.</td>
<td>x</td>
<td>0.25</td>
</tr>
<tr>
<td>13: Keeping the symptoms of my illness under control takes first priority whenever I’m doing something.</td>
<td>x</td>
<td>0.03</td>
</tr>
<tr>
<td>17: I avoid putting myself in situations where the symptoms of my illness might increase.</td>
<td>x</td>
<td>0.04</td>
</tr>
<tr>
<td>7: I need to concentrate on getting rid of symptoms of my illness.</td>
<td>x</td>
<td>0.12</td>
</tr>
<tr>
<td>4: I would gladly sacrifice important things in my life to control my illness better.</td>
<td>x</td>
<td>0.02</td>
</tr>
<tr>
<td>11: My thoughts and feelings about my illness must change before I can take important steps in my life.</td>
<td>x</td>
<td>0.13</td>
</tr>
<tr>
<td></td>
<td>Statement</td>
<td>Coefficient</td>
</tr>
<tr>
<td>---</td>
<td>---------------------------------------------------------------------------</td>
<td>--------------</td>
</tr>
<tr>
<td>18</td>
<td>My worries and fears about what my illness will do to me are true. (R)</td>
<td>x</td>
</tr>
<tr>
<td>20</td>
<td>I have to struggle to do things when I experience symptoms of my illness.</td>
<td>x</td>
</tr>
<tr>
<td>16</td>
<td>I will have better control over my life if I can control my negative thoughts about my illness. (R)</td>
<td>x</td>
</tr>
</tbody>
</table>
Table 2
Bivariate Correlations Among Variables Entered in Regression

<table>
<thead>
<tr>
<th></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>
</tr>
</thead>
<tbody>
<tr>
<td>1. PIDI total</td>
<td>-0.023</td>
<td>-0.158**</td>
<td>-0.351**</td>
<td>0.308**</td>
<td>-0.141**</td>
<td>-0.543**</td>
<td>-0.374**</td>
<td></td>
</tr>
<tr>
<td>2. Age</td>
<td>0.013</td>
<td>0.167**</td>
<td>-0.248**</td>
<td>0.283**</td>
<td>0.144**</td>
<td>0.044</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Education</td>
<td>0.202**</td>
<td>-0.087</td>
<td>-0.031</td>
<td>0.157**</td>
<td>0.203**</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Positive Affect</td>
<td>0.002</td>
<td>-0.329**</td>
<td>0.235**</td>
<td>0.586**</td>
<td>0.164**</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Negative Affect</td>
<td>0.529**</td>
<td>-0.410**</td>
<td>-0.289**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. MAAS Total</td>
<td>0.176**</td>
<td>0.165**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Activity Engagement</td>
<td>0.298**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Willingness</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

NOTE: ** Denotes \( p < .01 \) Two-tailed
Table 3
*Prediction of Perceived Illness Disability Life Domains*

<table>
<thead>
<tr>
<th>Predictor Variables retained in Model</th>
<th>Standardized Beta</th>
<th>t value</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>DV: Family/Home Responsibilities</strong> [$F(2,269) = 33.44, R^2_{adj} = .188, p &lt; .001$]</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CIAQ Activities Engagement</td>
<td>-.385</td>
<td>-6.70</td>
<td>.000</td>
</tr>
<tr>
<td>CIAQ Willingness</td>
<td>-.118</td>
<td>-2.06</td>
<td>.041</td>
</tr>
<tr>
<td><strong>DV: Recreation</strong> [$F(2, 281) = 30.26, R^2_{adj} = .171, p &lt; .001$]</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CIAQ Activities Engagement</td>
<td>-.277</td>
<td>-4.88</td>
<td>.000</td>
</tr>
<tr>
<td>CIAQ Willingness</td>
<td>-.244</td>
<td>-4.292</td>
<td>.000</td>
</tr>
<tr>
<td><strong>DV: Social Activity</strong> [$F(3, 279) = 45.55, R^2_{adj} = .322, p &lt; .001$]</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CIAQ Activities Engagement</td>
<td>-.373</td>
<td>-6.07</td>
<td>.000</td>
</tr>
<tr>
<td>CIAQ Willingness</td>
<td>-.212</td>
<td>-4.114</td>
<td>.000</td>
</tr>
<tr>
<td>PANAS Pos Affect</td>
<td>-.148</td>
<td>-2.488</td>
<td>.013</td>
</tr>
<tr>
<td><strong>DV: Occupation</strong> [$F(2, 280) = 44.265, R^2_{adj} = .235, p &lt; .001$]</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CIAQ Activities Engagement</td>
<td>-.413</td>
<td>-7.55</td>
<td>.000</td>
</tr>
<tr>
<td>CIAQ Willingness</td>
<td>-.167</td>
<td>-3.049</td>
<td>.003</td>
</tr>
<tr>
<td><strong>DV: Sexual Behavior</strong> [$F(2, 274) = 35.09, R^2_{adj} = .198, p &lt; .001$]</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CIAQ Activities Engagement</td>
<td>-.371</td>
<td>-6.446</td>
<td>.000</td>
</tr>
<tr>
<td>CIAQ Willingness</td>
<td>-.160</td>
<td>-2.775</td>
<td>.006</td>
</tr>
<tr>
<td><strong>DV: Self Care</strong> [$F(2, 281) = 25.39, R^2_{adj} = .147, p &lt; .001$]</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CIAQ Activities Engagement</td>
<td>-.306</td>
<td>-5.308</td>
<td>.000</td>
</tr>
<tr>
<td>CIAQ Willingness</td>
<td>-.168</td>
<td>-2.918</td>
<td>.004</td>
</tr>
<tr>
<td><strong>DV: Life Support Activity</strong> [$F(2, 277) = 16.96, R^2_{adj} = .103, p &lt; .001$]</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CIAQ Activities Engagement</td>
<td>-.276</td>
<td>-4.775</td>
<td>.000</td>
</tr>
<tr>
<td>Age</td>
<td>-.138</td>
<td>-2.383</td>
<td>.018</td>
</tr>
</tbody>
</table>