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## Patients' perception of their depressive illness

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### Abstract

Perception of illness has been described as an important predictor in the medical health psychology literature, but has been given little attention in the domain of mental disorders. The patient's Perception of Depression Questionnaire (PDIQ) is a newly developed measure whose factor structure and psychometric properties were evaluated on a sample of 174 outpatients meeting criteria for major depressive disorder. The clinical utility of the questionnaire was assessed on a sub-sample of 121 participants in a study of acupuncture treatment for depression. The questionnaire has four subscales, each with high internal consistency and high test–retest reliability. These four subscales are: Self-Efficacy, which reflects perceived controllability of the illness, Externalizing, which reflects attributing the illness to external causes, Hopeless/Flawed, which reflect a belief that depression is a personal trait and therefore there is little hope for cure, and Holistic, which reflects a belief in alternative therapies. Although the PDIQ did not predict outcome, its subscales were related to adherence to treatment, treatment preference, expectations, and therapeutic alliance. The subscales have adequate convergent/discriminant validity and are clinically relevant to aspects of treatment provision.

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### 1. Introduction

The manner in which individuals perceive their illnesses is likely to impact many aspects of their experience, including the likelihood of seeking help, the particular nature of the help that may be sought, the degree of adherence to the treatment prescribed, and the likelihood of response to such treatment. Health Psychology has focused on illness perception in the context of chronic diseases including diabetes (Alogna, 1980), chronic obstructive pulmonary disease, chronic fatigue syndrome, psoriasis, rheumatoid arthritis, heart disease, and others (Edwards et al., 2001; Petrie et al., 1996; Scharloo and Kaptein, 1997; Scharloo et al., 1998). Five components of illness representations have been identified (Leventhal et al., 1980): (1) disease identity (i.e. the labels placed on the disease and the symptoms patients

view as being part of the illness); (2) timeline (expectations about the duration and the characteristic course of the disease); (3) consequences (the expected outcomes and sequelae of the disease); (4) causes (personal ideas about the causes of the illness); and (5) controllability/cure (beliefs about the degree to which the disease is amenable to control or cure). A consistent pattern of association between these dimensions of illness perception and treatment outcome has emerged across disease domains. Strong belief that the disease is controllable/curable is associated with more visits to the outpatient clinic and rehabilitation centers (Petrie et al., 1996; Scharloo et al., 2000) and with favorable outcome (Flor and Turk, 1988; Marshall, 1991; Ray et al., 1997; Scharloo et al., 1998; Schussler, 1992). In contrast, strong illness identity, belief in a longer illness duration, and belief in more severe consequences of an illness are associated with worse outcome, even after controlling for disease severity (Edwards et al., 2001; Petrie et al., 1996; Scharloo and Kaptein, 1997; Scharloo et al., 1998; Weinman et al., 1996).

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Depression is a chronic recurrent illness (American Psychiatric Association, 1993) and, as in other chronic illnesses, the way individuals perceive depressive illness is likely to impact the course of illness, the type of treatment sought, adherence with treatment, and response to treatment. For example, patients who perceive their depressive illness as trait-like and those who believe that their depression is caused by a “chemical imbalance” or a “personal flaw” would be expected to prefer a medication approach to treatment and might not engage in or respond to psychotherapy. In contrast, those who view their depressive illness as transient and those who believe that they have some control over their depressive states are more likely to adhere to treatment. Although there is a rich body of research on generalized attribution styles on depressed patients, the data on depression specific causal attributions are more limited. Addis and colleagues developed the Reasons for Depression Questionnaire (Addis et al., 1995), which assess patients’ perception of the causes of their depression. These researchers found that the instrument is related to treatment outcome (Addis and Jacobson, 1996) and treatment preference (Addis and Carpenter, 1999).

The present paper introduces the Perception of Depressive Illness Questionnaire (PDIQ), developed to assess not only beliefs about the causes of depression, but also the patients’ beliefs about what might help recovery from depression and the personal meaning of depression, including beliefs about the consequences and time course of the illness. This paper describes the development of the questionnaire, identifies its factor structure, and explores the relationship of its subscales with other potentially relevant constructs and with patients’ treatment preferences. The paper also examines the utility of the PDIQ in predicting adherence to treatment, therapeutic alliance, expectations about outcome, and response to treatment.

## 2. Materials and methods

The PDIQ includes three different lists of items that are to be rated on a four point anchored scale. The scale anchors were as follows: 1 denoted “Not at all”; 2 denoted “Somewhat”, 3 denoted “Quite a bit”, and 4 denoted “Very much so”. The instruction for the first list (20 items) was: “For every item, rate the extent to which you believe the following contributed to your depression”(for example, “family situation”, “genetic factors”, “traumatic event”). The instruction for the second list (32 items) was: “For every item below rate the extent to which you believe that the following will help relieve your depression” (for example, “understanding myself better”, “taking antidepressants”, “exercising regularly”). The instruction for the third list (11 statements) was: “For every item below rate the

extent to which the following represent what being depressed means to you” (for example, “I have a new challenge”, “Even if I get better, chances are I’ll be depressed again.”). The authors generated a pool of items for each of the three categories, based on their clinical experience with depressed patients. After removing redundant items, the initial set of questions was administered to hospital employees, and ambiguous items were altered or removed.

The factor structure of the PDIQ was established on a sample of 174 participants who were enrolled in eight depression treatment studies in the Departments of Psychiatry and Psychology at the University of Arizona between 1997 and 2000 (*Sample A*). The PDIQ was administered before the participants were randomized to receive treatment and, for participants in one of the studies (*Sample B*), it was administered again at the end of treatment. The factor analysis was performed on baseline data. The studies provided the following treatments: antidepressant medication or placebo (7%), psychotherapy or Paxil (23%), and acupuncture or delayed treatment (70%). To minimize selection bias and conserve resources, recruitment into the different studies was accomplished mostly through common advertisements that did not mention a specific treatment. Responders to the advertisement were retrieved from a voice mailbox and were sequentially assigned to the different studies prior to any screening into the specific protocols. Baseline completion of the PDIQ was done after participants underwent the SCID and HRSD interviews and qualified to participate in each study. Convergent validity, test–retest reliability, and the predictive value of the PDIQ were established on a smaller sample of participants (121) who were enrolled in an acupuncture study (*Sample B*). Participants in *Sample B* were randomized to receive 8 weeks of acupuncture treatment for depression or to a delayed treatment control (8 weeks).<sup>1</sup> The University of Arizona human subjects committee approved all protocols and all participants signed a written informed consent.

### 2.1. Participants

Participants in *Sample A* (the factor analysis sample) were 174 adults (68% women) who met DSM-IV criteria for major depressive disorder (American Psychiatric Association, 1994) and spoke English. Diagnosis was based on a structured interview (SCID-P, First et al., 1994). The studies had different exclusion criteria but participants with a history of psychosis or mania and participants with co-morbid axis I disorders or with Cluster B Axis II disorders were excluded from all

<sup>1</sup> The patients who received treatment during the first 8 weeks have continued to receive treatment for an additional 8 weeks, but the present paper is based on data from the first 8 weeks of treatment.

studies. Participants were also excluded if they had active suicidal ideation necessitating immediate treatment, were not medically stable, or were taking psychotropic medications or other medications known to impact mood or sleep. Pregnancy was an exclusion criterion for all studies. Participants' ages ranged from 19 to 65 years (mean 42.5) and the ethnic distribution was as follows: 82% Caucasian, 10% Hispanic, 1% Native American, 0% African American, 3% Asian, and 4% Other.

Participants in Sample B (the validation sample) were 121 adults (69% women) who met DSM-IV criteria for major depressive disorder (MDD) and scored at least 14 on the 17-item Hamilton Rating Scale for Depression (HRSD, Hamilton, 1967). In addition to the exclusion criteria common to the other studies, participants in Sample B were excluded if they met MDD criteria for the current episode for more than 2 years (a history of chronic depression for previous episodes was not an exclusion), or had a history of severe head trauma or abnormal EEG. The ages of participants in Sample B ranged from 19 to 65 years (mean 42.4) and their ethnic distribution was as follows: 82% Caucasian, 10% Hispanic, 0% Native American, 0% African American, 3% Asian, and 5% Other.

## 2.2. Other measures

Severity of depression symptoms was assessed monthly by a clinical interviewer who were blind to group assignment, using the 24-item HRSD, and weekly by the patient, using the Beck Depression Inventory (BDI) (Beck et al., 1961). Relevant measures of the history of depression were derived from the SCID screening interview and included: age of onset of the first depressive episode, length of the current depressive episode, length of the longest depressive episode, number of previous episodes, and a dichotomous variable indicating whether or not the patient had a *history* of chronic or double depression (continuously meeting criteria for major depression for at least 2 years, or a current major depressive episode superimposed on dysthymia).

Additionally, for Sample B the following measures were obtained and subsequently used in this study to establish convergent and discriminant validity of the PDIQ subscales and to explore the relationship between perception of depressive illness and measures of treatment preference, expectations, and therapeutic alliance. Convergent and discriminant validity were examined using the following measures: Dysfunctional Attitude Scale (DAS) (Brown et al., 1995), the Response Styles Questionnaire (RSQ) (Nolen-Hoeksema et al., 1993, 1994) that measures depressive rumination, the Penn State Worry Questionnaire (PSWQ) (Meyer et al., 1990), the Trait Meta Mood Scale (TMM) (Salovey et

al., 1995), and the Stages of Change Questionnaire (DiClemente et al., 1985). Therapeutic alliance was measured with selected items (Hitt, 1996) from the California Psychotherapy Alliance Scales for client and therapist (CALPAS-C and CALPAS-T) (Marmar et al., 1989) and from the Session Evaluation Forms for client and therapist (SEF-C and SEF-T) (Shoham-Salomon et al., 1989), completed after the first and the third treatment sessions and averaged across both time points. [The correlation between the ratings at the two time points was  $r(72)=0.84$  for therapist ratings and  $r(75)=0.72$  for client ratings.] A measure of patient's resistance was also derived from the therapist's session evaluation forms (Hitt, 1996) and similarly averaged across both time points [ $r(77)=0.84$ ]. Expectations of patients and providers were measured by summing the ratings of the following items: "How effective do you believe this treatment is for you/your patient?" "How likely is it that you/your patient will be helped using this treatment?" "How much do you expect (your patient) to improve by the end of this 8 week phase of treatment?" Expectation scores were averaged across both time points [ $r(77)=0.84$  for therapist ratings and  $r(77)=0.66$  for client ratings]. To assess treatment preference participants were asked to rank order four therapeutic modalities (psychotherapy, medications, alternative treatment, and self-help) in terms of how likely they believed the treatment would be helpful to them.

## 3. Results

### 3.1. Factor analysis

Exploratory factor analysis was performed on Sample A after the squared multiple correlation matrix was determined to be different from the identity matrix. Factor extraction, using square multiple correlation prior commonality estimates, was followed by Varimax rotation. The minimal eigenvalue for retaining a factor prior to rotation was set at 1.0, and the minimal factor loading to consider as loading significantly on the factor was set at 0.30.<sup>2</sup> The number of factors was chosen based on the Scree plot of the eigenvalues using the following two additional criteria: (1) the resulting factors had to include at least six items per factor, and (2) the factors had to be judged by the authors to have fit together conceptually. This strategy resulted in four factors accounting for 51% of the variance: Self-Efficacy (18%), Externalizing (11%), Hopeless/Flawed (10%), and Holistic (12%). The items loading on each of the four factors and their factor loading are depicted

<sup>2</sup> One item with a factor loading of 0.29 was included because it conceptually fit the Self-Efficacy subscale (Table 1).

Table 1  
The four factors of the PDIQ and individual factor loading

Self-Efficacy (controllability)		Holistic	
Clarifying my priorities in life <sup>a</sup>	0.69	Taking homeopathic/naturopathic remedies <sup>a</sup>	0.71
Improving my relationships with others <sup>a</sup>	0.69	Taking herbal remedies <sup>a</sup>	0.64
Understanding myself better <sup>a</sup>	0.62	Receiving acupuncture <sup>a</sup>	0.64
Increasing social support <sup>a</sup>	0.62	Receiving alternative treatments other than acupuncture <sup>a</sup>	0.62
Changing how I think of myself <sup>a</sup>	0.61	Due to energetic imbalance	0.56
Changing some of my behaviors <sup>a</sup>	0.60	Learning and using relaxation techniques <sup>a</sup>	0.53
Working hard at solving my problems <sup>a</sup>	0.57	Being my own healer <sup>a</sup>	0.47
Having a confidant <sup>a</sup>	0.58	Improving sleep <sup>a</sup>	0.42
Seeking help from or talking to others <sup>a</sup>	0.56	Due to medical illness	0.38
I need to make changes in my life	0.53	Due to poor sleep	0.36
Improving my family situation <sup>a</sup>	0.53	Using my religiosity or spirituality <sup>a</sup>	0.36
Letting time heal <sup>a</sup>	0.53		
Increasing activities <sup>a</sup>	0.51		
Getting psychotherapy <sup>a</sup>	0.51		
Learning to cope with stress <sup>a</sup>	0.50		
Exercising regularly <sup>a</sup>	0.50		
Improving my diet <sup>a</sup>	0.49		
Improving health <sup>a</sup>	0.48		
Developing intimate relationships <sup>a</sup>	0.47		
Becoming more centered <sup>a</sup>	0.46		
Utilizing self help books <sup>a</sup>	0.44		
Having an explanation for my depression <sup>a</sup>	0.44		
Participating in support groups <sup>a</sup>	0.39		
Making Changes in my life situations <sup>a</sup>	0.29		
Externalizing (external causes)		Hopeless/Flawed (time line)	
Due to life circumstances	0.66	I will always be depressed	0.73
Due to stress	0.60	This is just the way I am	0.68
Due to financial problems	0.58	Even if I get better, chances are I'll be depressed again	0.63
Due to my family situation	0.46	I'm a hopeless case	0.60
Due to traumatic event	0.45	Due to personal flaws	0.54
Due to lack of social support/confidant	0.44	Due to low self-esteem	0.53
Due to lack of control over my life	0.44	Due to genetic	0.46
My religious needs are not being met	0.43	Due to mistakes of the past	0.40
I have a new challenge	0.43	My depression will get better with time	-0.43
Due to job situation	0.40	I have an opportunity to strengthen my character	-0.36
Due to personal loss/grief	0.40	It's just a phase I'm going through	-0.36
Improving my financial situation	0.40	Due to a chemical imbalance	0.35
Due to problems with significant others	0.37	Taking antidepressants <sup>a</sup>	0.33
I will be vulnerable to illness	0.33		
I am overwhelmed	0.35		

<sup>a</sup> Items from the list of components that will help the patient's depression.

in Table 1. The Self-Efficacy factor is so named because most of its items reflect a belief that the individual can be actively involved in helping relieve their depression. All, but one, of the 24 items of the Self-Efficacy factor are from the list of 32 items that the patients rated for helpfulness in relieving depression. The Externalizing factor is so named because many of its items reflect attribution of the cause of depression to factors outside of one's control. The Hopeless/Flawed factor is so named because most of its items reflect the belief that depression is a stable state and that it is due to one's inherent nature. The Holistic factor is so named because most of its items indicate a belief in holistic (alternative) medicine and a belief that depression and medical illness are on the same spectrum.

The internal consistency of the four factors is as follows: 0.91 for the Self-Efficacy factor, 0.80 for the Externalizing factor, 0.79 for the Hopeless/Flawed factor, and 0.80 for the Holistic factor. Five items did not load on any of the four factors.<sup>3</sup> Scale scores were then constructed using equal weighting of items that loaded on each factor. Equally weighted scale scores were selected over sample-optimized factor scores because this estimation is simple, allows for less capitalization of

<sup>3</sup> Of the five items that did not load on the four factors of the PDIQ, one was from the list of causes of one's depression: (Alcohol or drug use contributed to my depression) and four were from the list of components that might help depression (Avoiding mental health providers; Losing weight; Taking medication other than antidepressants, and Undergoing hypnosis).

chance, and yields a more stable estimation of factor scores than the exact weighted scores (Gorsuch, 1988). The equally weighted scores for each factor are referred to as subscale scores rather than factor scores. With equal weighting of items, and retaining only items that met out threshold criterion, the subscales are no longer expected to be completely orthogonal. Although the Hopeless/Flawed subscale remained orthogonal to the other scales in that its correlation with the other subscale scores were not significant, correlations among the remaining three subscales were significant (the correlation between the Self-Efficacy subscale and the Holistic subscale [ $r(173)=0.52, P<0.001$ ], the correlation between the Self-Efficacy subscale and the Externalizing subscale [ $r(173)=0.46, P<0.001$ ], the correlation between the Externalizing and the Holistic subscales [ $r(173)=0.32, P<0.001$ ] and the correlation between the Externalizing and the Hopeless/Flawed subscales [ $r(173)=0.23, P<0.01$ ].

Analyses of variance were used to compare the subscale scores for participants in the study involving acupuncture or delayed treatment (70%) and for participants in studies involving antidepressant medication (30%; these studies involved a comparison of antidepressant medication with either psychotherapy or pill placebo). There were no significant differences between studies in the Self-Efficacy subscale [ $F(1,172)=1.24, P=0.27$ ] or Externalizing subscale [ $F(1,172)=0.402, P=0.53$ ]. There were, however, differences in the Holistic subscale [ $F(1,172)=11.13, P=0.001$ ] and the Hopeless/Flawed subscale [ $F(1,172)=5.55, P<0.05$ ]. Table 2 summarizes the means and standard deviations of the subscale scores for the two sub-samples and for the combined samples.

### 3.2. Convergent and discriminant validity

Convergent and discriminant validity were established on sample B. As a protection against spurious significant correlations in the context of computing multiple correlations, the sample was randomly split in half and correlations on the whole sample were computed only when the correlations were significant ( $P<0.05$ ) in both halves or when the correlation was significant in

one half and there was at least a trend ( $P<0.1$ ) in the other half of the sample. The degrees of freedom for the correlations vary because of missing or incomplete data on some of the questionnaires. In particular, fewer participants completed the PSWQ because it was introduced a few months after the study began.

Table 3 summarizes the correlations between the four subscales and other potentially related measures. The Hopeless/Flawed subscale was the only subscale that significantly correlated with some measures of depression (BDI and DAS), but it did not correlate with other measures of depression (the HRSD, the length of the current depressive episode, the age of onset of the first depressive episode, the number of previous episodes, the length of the longest episode, and whether or not the patient had a history of a chronic depressive episode). Higher ratings of expected helpfulness of antidepressant medication were significantly associated with higher ratings on the Hopeless/Flawed subscale [ $\rho(120)=0.36, P<0.001$ ] and with lower scores on the Self-Efficacy subscale [ $\rho(120)=-0.32, P<0.001$ ].

### 3.3. Test–retest reliability

Test–retest reliability of each of the four PDIQ factors was assessed on the delayed treatment group in Sample B by computing the Pearson correlation between the scale scores at baseline and after 8 weeks of no treatment, just before beginning active treatment. PDIQ scores demonstrated good test retest stability. Pearson correlations for PDIQ scale scores at baseline and at the end of the 8 week waiting period were: 0.83 for Self Efficacy, 0.83 for Holistic, 0.75 for Externalizing, and 0.81 for the Hopeless/Flawed subscale ( $P$  values  $<0.001$ ). These test retest values approach the limit imposed by the reliability of the scales. Employing the correction for attenuation,<sup>4</sup> the estimated test–retest correlations become 0.91 for Self Efficacy, 1.0 for Holistic, 0.94 for Externalizing, and 1.0 for the Hopeless/Flawed factor.

### 3.4. PDIQ, expectations, resistance, and therapeutic alliance

There was a positive correlation between provider ratings of expected efficacy and patient scores on the Holistic subscale [ $r(77)=0.28, P<0.05$ ]. There was a positive correlation between patient expectations that acupuncture will be effective and their scores on the Holistic subscale [ $r(77)=0.35, P<0.01$ ] and a negative

Table 2  
Summary of ANOVA between medication sample and acupuncture sample

	Medication sample		Acupuncture sample	
	Mean	S.D.	Mean	S.D.
Self-Efficacy	64.39	12.90	62.02	13.00
Holistic**	23.31	5.72	26.51	5.87
Externalizing	36.66	7.87	35.84	7.82
Hopeless/Flawed*	32.49	6.40	29.96	6.54

\* $P<0.05$ ; \*\* $P<0.001$ .

<sup>4</sup> The correction for attenuation estimates the correlation between two measures given perfect reliability. It is calculated by  $\frac{r_{xy}}{\sqrt{r_{xx}r_{yy}}}$ , where  $r_{xy}$  is the observed correlation between two scores (e.g. test and retest),  $r_{xx}$  is the reliability of one measure and  $r_{yy}$  is the reliability of the other.

Table 3  
Convergent and discriminant validity of the PDIQ<sup>a</sup>

	Depression		Rumination		TMM	SCQ
	BDI	DAS	RSQ	PSWQ		
Hopeless/Flawed	0.37*	0.40*	Rumination: 0.35*	0.27**	Attention to mood: 0.01	Contemplative: 0.07
			Distraction: 0.07		Repair: -0.48*	Action: -0.16
Self Efficacy	0.09	0.05	Rumination: 0.21	0.22	Attention to Mood: 0.32*	Contemplative: 0.48*
			Distraction: 0.25		Repair: 0.00	Action: 0.39*
Externalizing	0.12	0.03	Rumination: 0.30	0.17	Attention to Mood: 0.27*	Contemplative: 0.30**
			Distraction: 0.27**		Repair: -0.06	Action: 0.30**
Holistic	0.15	-0.08	Rumination: 0.14	0.22	Attention to Mood: 0.26	Contemplative: 0.30**
			Distraction: 0.34		Repair: 0.20	Action: 0.45*

<sup>a</sup> BDI is the Beck Depression Inventory; DAS is the Dysfunction Attitude Scale; RSQ is the Response Style Questionnaire (Only Ruminative and Distracting Thoughts were significant, not Ruminative or Distracting Behaviors); PSWQ is the Penn State Worry Questionnaire; TMM is the Trait Meta Mood (no subscale of the PDIQ was significantly correlated with the Clarity subscale of the TMM); SCQ is the Stages of Change Questionnaire (no subscale of the PDIQ was significantly correlated with the pre-contemplative or the maintenance stages).

\*  $P < 0.001$ ; \*\*  $P < 0.01$ .

Table 4  
Summary of hierarchical regression analysis for variables predicting post treatment HRSD scores<sup>a</sup>

	B (unstandardized weights)	S.E.	$\beta$ (standardized weights)
<i>Step 1</i>			
Baseline HRSD	0.47*	0.16	0.34*
<i>Step 2— PDIQ factors</i>			
Self-efficacy	0.05	0.10	0.07
Holistic	-0.08	0.20	-0.06
Externalizing	0.17	0.14	0.16
Hopeless/Flawed	0.25	0.15	0.19

<sup>a</sup> Regression results for acupuncture treatment:  $R^2 = 0.12$  for step 1,  $P < 0.01$ ;  $\Delta R^2 = 0.07$ ,  $P = 0.26$ ;  $n = 71$ .

\*  $P < 0.01$ .

correlation with their scores on the Hopeless/Flawed subscale [ $r(77) = -0.38$ ,  $P < 0.001$ ].

Patient ratings of therapeutic alliance were significantly correlated with the Holistic subscale [ $r(75) = 0.24$ ,  $P < 0.05$ ]. Providers' ratings of therapeutic alliance were significantly correlated with the Self-Efficacy [ $r(72) = 0.26$ ,  $P < 0.05$ ], Holistic [ $r(72) = 0.37$ ,  $P < 0.001$ ], and Externalizing [ $r(72) = 0.36$ ,  $P < 0.01$ ] subscales. Additionally, provider rating of patient resistance was significantly and negatively correlated the Self-Efficacy subscale [ $r(77) = -0.31$ ,  $P < 0.01$ ] and with the Holistic subscale [ $r(77) = -0.41$ ,  $P < 0.001$ ].

### 3.5. PDIQ and treatment response

The ability of the PDIQ to predict treatment response was assessed on sample B using a hierarchical regression model with post treatment HRSD as the dependent variable. Baseline HRSD, a well-established predictor of outcome (Thase et al., 1993), was first entered into the model followed by the four PDIQ factors entered simultaneously. The regression analysis was conducted for the subgroup receiving acupuncture treatment (Table 4). Overall, the model explained 19% of the

variance [ $F(5,70) = 2.93$ ,  $P = 0.02$ ]. Consistent with previous findings, baseline HRSD scores predicted the final HRSD scores (symptom severity at the end of 8 weeks) [ $R^2 = 0.12$ ,  $F(1,70) = 9.04$ ,  $P = 0.004$ ]. The PDIQ subscales, entered in the second step as a block, did not add significantly to the variance beyond what was accounted for by baseline HRSD (semi-partial  $r^2 = 0.07$ ,  $P = 0.26$ ).

Analyses of variance were performed to determine whether the PDIQ subscale scores would differentiate treatment completers from those who dropped out. The results indicate a strong trend for lower Self-Efficacy scores for dropouts [ $53.0 \pm 11.1$  versus  $62.4 \pm 12.8$ ;  $F(1,77) = 3.94$ ;  $P = 0.051$ ], but no difference was detected for the other three subscales ( $P \geq 0.248$ ).

## 4. Discussion

The PDIQ, a measure of patient's perception of depression, was found in this study to have four subscales, Self-Efficacy, Externalizing, Hopeless/Flawed, and Holistic, each with a high internal consistency and high test-retest reliability. Previous research in Health Psychology developed a five dimensional model for how

patients perceive their medical illness and the relationship between the patients' illness perceptions and their experience with the illness (Leventhal et al., 1980). Of the four subscales that emerged in this study three can be mapped onto Leventhal's model. The Self-Efficacy subscale of the PDIQ appears to measure the "controllability/cure" dimension of the illness perception model, with most items on the subscale reflecting the personal belief that the depression can be controlled by actions taken by the patients. Individuals with high scores on this subscale were found to be attending to their mood states and to be either contemplating or already taking actions to help alleviate their depression. The Externalizing subscale appears to measure the personal belief that the depression has been caused by factors outside of the patient's control, such as life circumstances, and as such it has some overlap with the "causal" dimension of the illness perception model. Individuals with high scores on this subscale were found to be attending to their negative mood states, to be actively engaged in distracting thoughts, and to either be contemplating or already taking actions to help alleviate their depression. The Hopeless/Flawed subscale maps onto the "timeline" dimension of the illness perception model, as its items reflect a belief that the depression is trait-like. Individuals with high scores on this subscale had more dysfunctional attitudes, had more worries and rumination, and were not engaged in actively repairing negative moods, a finding that is consistent with a previous report of a negative correlation between pessimism and the Repair subscale of the TMM (Salovey et al., 1995). The Hopeless/Flawed subscale was positively correlated with self rated depression severity (BDI), but not with other measures of depression severity (clinician rated severity (HRSD), the length of the current depressive episode, the age of onset of the first depressive episode, the number of previous episodes, the length of the longest episode, and whether or not the patient had a history of a chronic depressive episode). The fact that the Hopeless/Flawed subscale correlated significantly with the BDI but not with the HRSD is not surprising given that the former has a greater number of items addressing the cognitive symptoms of depression, including hopelessness. Absence of significant correlation between the Hopeless/Flawed subscale and measures of the chronicity of the illness might be best explained by the potentially low reliability of the interview-based retrospective measures of chronicity.

The items of the Holistic subscale reflect a belief that the depression is impacted by spiritual/psychological factors and medical status and that it will be best treated with holistic approaches. This fourth subscale does not correspond to any of the five dimensions of the illness perception model (Leventhal et al., 1980), and it may be specific to this sample (70% of the sample consisted of

participants in a study of acupuncture for depression). On the other hand, the difference in scores on this subscale between those enrolled in the acupuncture study and those enrolled in the studies involving pharmacological treatments was relatively small (14% higher in the acupuncture sample), suggesting that even in the absence of being randomized to a treatment trial involving an alternative treatment, individuals endorse items on this subscale. The emergence of this subscale in this study likely reflects the specific inclusion of such items during scale development, and the increasing utilization of alternative and holistic treatments for many illnesses including depression (Eisenberg et al., 1998). Persons with high scores on this subscale scored high on the contemplation and action subscales of the Stages of Change.

#### 4.1. Clinical utility

The PDIQ appears to have clinical utility in that it is related to treatment completion, treatment preference, patients' expectations, and therapeutic alliance. Self-Efficacy scores of dropouts were significantly lower than for treatment completers. In addition, high Self-Efficacy scores were associated with preference for psychotherapy and rejection of antidepressant medications whereas high Hopeless/Flawed scores were associated with preference for antidepressant medications. High scores on the Holistic subscale were associated with preference for acupuncture and for other holistic medicine approaches. The subscales of the PDIQ were also related to therapeutic alliance and to patients' and providers' expectations regarding the potential efficacy of the treatment they receive. For example, individuals with high scores on the Hopeless/Flawed subscale who received acupuncture treatment had a low expectation that the acupuncture treatment they were receiving would be helpful, whereas those with high scores on the Holistic subscale had high expectations that the holistic treatment provided to them will be beneficial.

As would be expected, among those who received acupuncture, higher scores on the Holistic subscale were associated with higher patients' and providers' ratings of therapeutic alliance. Providers' ratings of therapeutic alliance were also significantly correlated with the Self-Efficacy and the Externalizing subscales. The contribution of patients' perception of depression to the variance in depression outcome beyond the contribution of the baseline severity was, however, not statistically significant. This does not preclude the possibility that the subscales of the PDIQ might predict response to other forms of treatment, but this assertion will need to be empirically tested in future studies. Two existing studies that examined the relationship between patients' perception about the causes of depression and treatment outcome did not control for the effect of baseline severity

of depression and yielded conflicting results. In one of the studies, clients who endorsed existential reasons for depression had better outcome in cognitive therapy and worse outcome in behavioral activation treatment for major depression and clients that endorsed relationship-oriented reasons had poor outcome in cognitive therapy (Addis and Jacobson, 1996). In another study, by the same group of researchers, reason-giving was related to treatment preference, but not to outcome (Addis and Carpenter, 1999).

#### 4.2. Limitations

One limitation to the current study is the small sample size relative to the number of items in the questionnaire. A second limitation is related to the specific nature of the sample. First, participation in a treatment protocol is likely to contextualize the perceived nature of depression and thus limits the generalizability of the results to community outpatients. Second, the exclusion of many comorbid Axis I and Axis II disorders and chronic forms of Major depression similarly limit the generalizability of the results to community outpatients. Third, the results obtained in this study might not generalize to a sample of patients enrolled in a clinical trial of antidepressants or psychotherapy. We have made efforts to ensure that the acupuncture sample is comparable to other antidepressant trials. These efforts included comparable inclusion criteria, and the use of a generic advertisement, which funneled responders to the advertisements into one of the medication trials or the acupuncture trial prior to any contact between study staff and ad responders. The resulting sample was indeed comparable to many other antidepressant trials in that a substantial proportion of the participants in the acupuncture trial had past histories of treatment with medication (57%) or psychotherapy (53%). Moreover, 88% had at least one prior episode of depression and 28% had a previous episode of dysthymia or MDD that lasted at least two years. Nevertheless, it is conceivable that the type of treatment that was subsequently provided influenced patients' perceptions of their depressive illness. Because the majority of the sample (70%) consisted of patients participating in an acupuncture study, it is possible that a large proportion of the sample had a strong belief in alternative therapies. Indeed, participants in the acupuncture sample had higher scores on the Holistic subscale than the rest of the sample. These beliefs, however, were unlikely to be the result of an a-priori selection bias, as only 2% of those responding to the neutral ads declined screening because the treatment modality was acupuncture. It is more plausible that patients' beliefs changed as a result of their enrollment in and commitment to a study that provided acupuncture. Additional research is needed to replicate the findings in less specific samples and to test the utility of

the PDIQ in explaining which patient will respond to which treatment.

## 5. Conclusions

The validity of the PDIQ is supported by its psychometric properties and by the fact that three of its four subscales measure constructs that are similar to dimensions of the illness perception model of Leventhal et al. (internal personal control, external causes, and continuous course). The overall pattern of results suggests that the subscales have high internal consistency, high test-retest reliability, and adequate convergent and discriminant validity. This measure of patients' perception of their depression has potential utility in predicting preferred treatment options, expectations about treatment efficacy early in the course of treatment, and adherence to treatment. Future research could use the PDIQ to investigate aptitude by treatment interactions (Dance and Neufeld, 1988) by ascertaining whether patient perceptions moderate treatment response. It might also be useful in predicting adherence to treatment in community outpatient settings and the long-term course of this, often recurrent and chronic, condition but these assertions will need to be empirically tested.

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