

The Assessment of Present-Moment Awareness and Acceptance

The Philadelphia Mindfulness Scale

LeeAnn Cardaciotto

La Salle University

James D. Herbert

Evan M. Forman

Ethan Moitra

Victoria Farrow

Drexel University

The purpose of this project was to develop a bidimensional measure of mindfulness to assess its two key components: present-moment awareness and acceptance. The development and psychometric validation of the Philadelphia Mindfulness Scale is described, and data are reported from expert raters, two nonclinical samples ($n = 204$ and 559), and three clinical samples including mixed psychiatric outpatients ($n = 52$), eating disorder inpatients ($n = 30$), and student counseling center outpatients ($n = 78$). Exploratory and confirmatory factor analyses support a two-factor solution, corresponding to the two constituent components of the construct. Good internal consistency was demonstrated, and relationships with other constructs were largely as expected. As predicted, significant differences were found between the nonclinical and clinical samples in levels of awareness and acceptance. The awareness and acceptance subscales were not correlated, suggesting that these two constructs can be examined independently. Potential theoretical and applied uses of the measure are discussed.

Keywords: *mindfulness; acceptance; awareness; attention; experiential avoidance*

Historically, the concept of mindfulness has been associated with spiritual movements rather than mainstream psychology. Some psychotherapists in the mid-20th century used *techniques* associated with mindfulness in their work. This trend significantly expanded beginning

in the early 1990s, when several innovative psychotherapies integrated the *discipline* of mindfulness into clinical psychology, more closely resembling the construct's Buddhist roots. These treatments are either based on mindfulness training, as in Mindfulness-Based Stress Reduction

Portions of this research were previously presented at the annual meetings of the Association for Behavioral and Cognitive Therapies (formerly the Association for Advancement of Behavior Therapy) in November 2005 and November 2006. Correspondence concerning this article should be addressed to LeeAnn Cardaciotto, Department of Psychology, La Salle University, Box 268, 1900 W. Olney Avenue, Philadelphia, PA 19141; e-mail: cardaciotto@lasalle.edu.

Assessment, Volume XX, No. X, Month XXXX xx-xx
DOI: 10.1177/1073191107311467
© 2008 Sage Publications

(MBSR; Kabat-Zinn, 1982, 1990) and Mindfulness-Based Cognitive Therapy (MBCT; Segal, Williams, & Teasdale, 2002; Teasdale, Segal, & Williams, 1995), or include mindfulness as a key component, as in Acceptance and Commitment Therapy (ACT; Hayes, Strosahl, & Wilson, 1999) and Dialectical Behavior Therapy (DBT; Linehan, 1993). In response to the rapid development of mindfulness-based treatments, several authors (e.g., Dimidjian & Linehan, 2003; Roemer & Orsillo, 2003) called for the development of the means to measure mindfulness.

At the initiation of the present research, there were only two published measures of mindfulness: The Freiburg Mindfulness Inventory (FMI; Buchheld, Grossman, & Walach, 2001) and The Mindful Attention Awareness Scale (MAAS; Brown & Ryan, 2003). The Freiburg Mindfulness Inventory was designed only for use with individuals who have had prior exposure to the practice of mindfulness meditation, and the authors note that the meaning of some items may not be clear to those without meditation experience. The MAAS (Brown & Ryan, 2003) was designed to measure mindfulness, defined as “present-centered attention-awareness,” as a unidimensional construct, and the authors explicitly state that items containing attitudinal components (e.g., acceptance) were excluded because they provided no explanatory advantage. Our intention was to develop a measure of mindfulness that (a) could be applied in populations without meditation experience and (b) would assess acceptance distinctly from ongoing awareness, given the centrality of each to the construct of mindfulness.

Conceptualization of Mindfulness in Clinical Psychology

Modern Western conceptualizations generally have remained consistent with the original Buddhist descriptions of mindfulness (Bishop, 2002). Mindfulness in the Buddhist tradition has been referred to as “bare attention,” or a nondiscursive registering of events without reaction or mental evaluation, which emphasizes the process of sustained attention rather than the content to what are attended (Thera, 1972). Among Western descriptions in clinical psychology, variations of the definition of mindfulness by Kabat-Zinn (1994) are most frequently cited: “Paying attention in a particular way: on purpose, in the present moment, and nonjudgmentally” (p. 4). In response to the need for greater clarity, Bishop and colleagues (2004) held a series of meetings to establish consensus on the elements of mindfulness and proposed an operational definition that focuses on two components: sustained attention to present experience, and an attitude of openness, curiosity, and acceptance. Although other conceptualizations of mindfulness have included components

including nonstriving, gratitude, and “lovingkindness” (Kabat-Zinn, 1990), most definitions of mindfulness highlight two key constructs: (a) the behavior that is conducted, which we refer to as ongoing awareness and (b) how that behavior is conducted, which we refer to as acceptance. Thus, we conceptualized mindfulness as *the tendency to be highly aware of one’s internal and external experiences in the context of an accepting, nonjudgmental stance toward those experiences*.

The first component of mindfulness, awareness, is characterized as a continuous monitoring of experience (Deikman, 1996) with a focus on current experience rather than preoccupation with past or future events (Roemer & Orsillo, 2003). Mindfulness also has been characterized as a “regulation of attention” (Astin, 1997, p. 100), and many definitions of mindfulness in clinical psychology refer to attention. Attention can be defined as a heightened sensitivity to a restricted range of experience (Kosslyn & Rosenberg, 2001), which implies that experience outside of attention is actively ignored or disregarded. Both awareness and attention are primary features of consciousness (Brown & Ryan, 2004), and certain approaches to meditation (e.g., concentrative meditation) involve fixing and redirecting attention onto a single stimulus. However, one problem with defining the behavioral component of mindfulness as *attention* is that any self-regulation of awareness is inconsistent with a position of thoroughgoing acceptance (Brown & Ryan, 2004), which is a core feature of most conceptualizations of the construct. That is, one cannot be fully open and accepting of the full range of psychological experience if one is simultaneously attempting to direct attention in any particular way (e.g., away from external stimuli, as in certain forms of concentrative meditation). Although both constructs have been used in defining and operationalizing mindfulness, the term *awareness* more accurately depicts the behavioral component of mindfulness, because it involves the continuous monitoring of the totality of experience.

The second component of mindfulness is the way in which present-moment awareness is conducted: nonjudgmentally, with an attitude of acceptance, openness, and even compassion toward one’s experience. Acceptance has been defined as “experiencing events fully and without defense, as they are” (Hayes, 1994, p. 30), during which one is open to the reality of the present moment without being in a state of belief or disbelief (Roemer & Orsillo, 2003). In the context of a stance of acceptance, one lets go of judgment, interpretation, and/or elaboration of internal events, and makes no attempt to change, avoid, or escape from the internal experience. Acceptance in this context should not be confused with passivity or resignation; instead, it is being present with, rather than preoccupied

with or avoiding, private events as they occur (Breslin, Zack, & McMain, 2002). Furthermore, it allows for increased contact with distressing stimuli, which has been shown to be associated with various positive benefits. For example, Levitt, Brown, Orsillo, and Barlow (2004) reported that during a biological challenge, patients with panic disorder instructed to accept anxiety sensations were significantly less anxious and avoidant, and were more willing to participate in the task again. Similar results were reported by Eifert and Heffner (2003), who found that participants in an acceptance condition were less avoidant behaviorally and reported less intense fear, cognitive symptoms, and fewer catastrophic thoughts during carbon dioxide inhalations.

Although most descriptions of mindfulness reflect the components of awareness and acceptance, the distinction between the two generally is not emphasized. Brown and Ryan (2003, 2004) argue on both theoretical and empirical grounds that the acceptance component of mindfulness is redundant with the awareness component. However, one cannot assume that increased present-focused awareness will necessarily occur with an attitude of enhanced acceptance, and conversely that enhancing one's stance of acceptance will necessarily lead to increased awareness. The degree to which changes in either component tend to impact changes in the other is an open question, and it should not be assumed that the two components are inextricably linked.

Although it is not known how the enhancement of awareness or acceptance impacts the other, both positive and negative consequences of increased awareness have been documented. Heightened awareness has been associated with higher-quality moment-to-moment experiences, such as higher ratings of pleasure during increased attention on the sensory experience of eating chocolate (LeBel & Dubé, 2001). Focusing on positive aspects of the self is related to a decrease in negative affect (Mor & Winquist, 2002). Furthermore, enhancing self-awareness through consistent self-monitoring has been shown to account for about a quarter of weight-control success (Boutelle & Kirschenbaum, 1998). However, there can be danger in increasing one's awareness of private experiences. Focusing on the emotional and physiological experiences associated with rejection can lead to increased anger and hostility (Ayduk, Mischel, & Downey, 2002). Directing attention to a painful stimulus has shown to increase its perceived intensity (Miron, Duncan, & Bushnell, 1989; Roelofs, Peters, Patijn, Schouten, & Vlaeyen, 2004), ratings of unpleasantness (Miron et al., 1989), as well as emotional distress and psychosocial disability (McCracken, 1997). Panic disorder is often associated with increased awareness of internal physiological cues (e.g., Ehlers & Breuer, 1992, 1996), but

this heightened awareness is not accepted nonjudgmentally. Self-focused attention has been strongly implicated in the experience of chronic negative affect (for a review, see Mor & Winquist, 2002) and contributes to many psychological disorders including depression, anxiety, substance abuse, schizophrenia, and psychopathy (Ingram, 1990). Furthermore, rumination, a type of self-focused attention, maintains and prolongs negative affect (e.g., Nolen-Hoeksema, 1991). Therefore, there is substantial evidence that increased awareness of one's experiences is not necessarily always adaptive or healthy.

The mixed effects of heightened awareness may be related to the degree to which this awareness is associated with an attitude of nonjudgment or experiential acceptance. One well-documented reaction to having increased awareness in the absence of an accepting stance has been referred to as experiential avoidance, or an unwillingness to remain in contact with particular distressing private experiences (e.g., thoughts, memories, emotions, bodily sensations), and taking steps to alter the form, frequency, or both of these experiences and the contexts that elicit them (Hayes, Wilson, Gifford, Follette, & Strosahl, 1996). Experiential avoidance has been shown to be associated with a range of psychological distress, including posttraumatic symptomology (Plumb, Orsillo, & Luterek, 2004), greater panic symptoms, fear, and feelings of uncontrollability during a biological challenge (Karekla, Forsyth, & Kelly, 2004), as well as depression, anxiety, and other signs and symptoms of mental ill-health (for a review, see Hayes, Luoma, Bond, Masuda, & Lillis, 2006). Furthermore, there is growing evidence for the negative consequences of efforts of deliberately ignoring or avoiding aspects of one's experience. For example, thought suppression has been found to have paradoxical effects, producing the phenomena that it is directed against (Wegner, Schneider, Carter, & White, 1987), and has been associated with heightened pain experience (Sullivan, Rouse, Bishop, & Johnston, 1997), more distress and greater urge to do something about the thoughts suppressed (Marcks & Woods, 2005), increased anxiety (Koster, Rassin, Crombez, & Naring, 2003), and poorer ratings of quality of sleep (Harvey, 2003). Suppression of urges to engage in alcohol consumption is related to increases in the expected reinforcing effect of alcohol by heavy drinkers (Palfai, Monti, Colby, & Rohsenow, 1997). Repeated suppression of self-discrepant thoughts affected the vividness of auditory illusions (García-Montes, Pérez-Álvarez, & Fidalgo, 2003). Furthermore, during a cold-pressor pain induction, not only did suppression result in the slowed recovery from pain, but also produced delayed negative consequences as well: an innocuous vibration administered following the task was rated as

more unpleasant by subjects who had attempted to suppress feelings of pain (Cioffi & Holloway, 1993). In addition, thought suppression has been implicated in the etiology of depression, generalized anxiety disorder, specific phobia, posttraumatic stress disorder, and obsessive-compulsive disorder (Purdon, 1999). Therefore, failure to exercise acceptance in the context of heightened awareness of unpleasant internal or external stimuli may be detrimental to psychological well-being, so examining acceptance separately from awareness in the study of mindfulness is especially important.

Measurement of Mindfulness and Its Components

Several self-report questionnaires that assess mindfulness have recently been developed, and represent independent attempts to operationalize and measure this construct. The Toronto Mindfulness Scale (TMS; Lau et al., 2006) was created to assess the attainment of a mindful *state*, and is designed for use immediately following a meditation exercise. Although there are other measures that are not dependent on meditative practice and can be administered at any time, mindfulness is conceptualized quite differently in each. As discussed above, the MAAS (Brown & Ryan, 2003) has a single-factor structure focusing on awareness only. Similarly, the Cognitive and Affective Mindfulness Scale-Revised (CAMS-R; Feldman, Hayes, Kumar, & Greeson, 2003; Feldman, Hayes, Kumar, Greeson, & Laurenceau, 2007) is a 12-item measure that yields a total score composed of four processes needed to reach a mindful state (i.e., awareness, attention, focus on the present, and acceptance/nonjudgment); these processes are not measured separately as subscales. The Kentucky Inventory of Mindfulness Skills (KIMS; Baer, Smith, & Allen, 2004) and the Five Factor Mindfulness Questionnaire (FFMQ; Baer, Smith, Hopkins, Krietemeyer, & Toney, 2006) were both based on multidimensional concepts of mindfulness. The KIMS is a 39-item inventory that assesses four elements of mindfulness according to Linehan's (1993) DBT: observe, describe, act with awareness, and accept without judgment. The FFMQ is a 39-item inventory resulting from the combined pool of items from several measures of mindfulness; although the measure contains five factors (i.e., observing, describing, acting with awareness, nonjudging of experience, and nonreactivity to inner experience), psychometric analyses suggest that at least four of the factors (i.e., all but observing) are components of an overall mindfulness construct, but the factor structure may vary with meditation experience.

Measuring Mindfulness Bidimensionally: The Current Study

As argued by Roemer and Orsillo (2003) and Baer et al. (2006), mindfulness is a multifaceted construct; independently assessing the components of mindfulness may help determine the hypothesized mechanisms of the new mindfulness-based treatments previously discussed. The only published multidimensional trait measures of mindfulness to date are the KIMS (Baer et al., 2004) and FFMQ (Baer et al., 2006). Although both include subscales that measure awareness and acceptance, the two components highlighted in the definitions proposed by Kabat-Zinn (1994) and Bishop and colleagues (2004), it is unclear whether these measures can be used to dismantle the construct of mindfulness and study these components independently. For example, the "observe" (i.e., noticing or attending to both internal and external phenomena) and acceptance components in the KIMS showed a significant modest relationship (Baer et al., 2004), and the observe component in the development of the FFMQ (Baer et al., 2006) did not fit the hierarchical model of mindfulness in the full sample.

Based on the definition of mindfulness formulated by Kabat-Zinn (1994) and congruent with Bishop and colleagues (2004), our intention was to develop and provide preliminary validation for a brief, bidimensional measure of mindfulness based on a conceptualization of the two key components of the concept, namely, present-moment awareness and acceptance. Although useful for other purposes, none of the existing measures of mindfulness adequately capture these two key constituents of mindfulness as *separate* and distinct constructs. Since these components are conceptualized not only to be part of mindfulness but have also been shown to be independently related to mental health/psychopathology, a single measure that assesses present-moment awareness and acceptance as outcomes would provide another tool to study the nature of mindfulness and how these two components interact.

In developing the measure, we purposefully bound the construct of mindfulness to *only* awareness and acceptance. Activities such as assessing tendencies to describe one's internal states may be useful, but are not central to the construct of mindfulness as described above. Thus, one potential shortcoming of the KIMS and FFMQ are their inclusion of subscales that are redundant with one another and not necessarily reflective of core components of mindfulness. For example, the KIMS "describe" factor (i.e., labeling observed phenomena) requires awareness of one's immediate experience and is said to be conducted in the context of acceptance (Baer

et al., 2004). Moreover, this factor moderately correlated with the other KIMS subscales in initial development studies (i.e., $r = .22-.34$).

In addition to issues surrounding the definition and measurement of the construct, the presence of additional subscales results in relatively lengthy measures. Thus, another aim of the current study was to create a reliable and valid self-report scale that measures the key dimensions of mindfulness in as few items as possible.

The Philadelphia Mindfulness Scale (PHLMS) was designed in six stages. Each stage is reported as a separate study, as follows: (a) item generation and selection; (b) factor structure and internal consistency; (c) validation analyses with a normative student sample; (d) validation analyses with a general psychiatric clinical sample; (e) validation analyses with an eating disorders sample; and (f) validation analyses with a student counseling center sample.

STUDY 1: ITEM GENERATION AND SELECTION

Method

A total of 105 items (55 awareness items, 50 acceptance items) was generated by clinical psychology faculty and graduate students familiar with the construct of mindfulness and mindfulness-based psychotherapies. The items were explicitly designed to tap either present-moment awareness or acceptance. Based on a review of the published literature on mindfulness in clinical psychology, awareness was defined as “the continuous monitoring of ongoing internal and external stimuli,” and acceptance was defined as “a non-judgmental stance toward one’s experience.” Items were designed to reflect a Grade-5 reading level.

Expert judges (i.e., recognized researchers who have published in the area of mindfulness) were recruited to establish the content validity of the initial items of the measure. Given that five or more judges are recommended for establishing content and face validity (Netemeyer, Bearden, & Sharma, 2003), six expert judges were recruited (4 males, 2 females). The list of items and the definitions of awareness and acceptance as described above were submitted to the expert judges who made two ratings for each item based on how well each item reflected the two intended dimensions of mindfulness (i.e., awareness or acceptance). Items were rated on a 5-point Likert-type scale (1 = *very poor*, 2 = *poor*, 3 = *fair*, 4 = *good*, and 5 = *very good*).

Result and Discussion

The *V* Index, a content validity coefficient (Aiken, 1996), was used for item retention. The *V* Index provides an overall measure of content validity for *N* raters on a single

scale for multiple items; the value of *V* ranges from 0.00 to 1.00, and tables determining the statistical significance of *V* can be found in Aiken (1985). Items were retained if they were rated by all judges as highly reflecting one dimension of mindfulness ($V > .71$, $p < .05$) and simultaneously not reflecting the other dimension ($V < .29$, $p < .05$). Applying this criterion, 58 items (29 awareness items, 29 acceptance items) were retained. For the retained awareness items, ratings for how well these items reflected the definition of awareness ranged from 3.8 to 5.0, with a mean of 4.33, and ratings for how well the awareness items reflected the definition of acceptance ranged from 1.3 to 2.2, with a mean of 1.75. For the retained acceptance items, ratings for how well these items reflected the definition of acceptance ranged from 3.8 to 4.5, with a mean of 4.14, and ratings for how well the acceptance items reflected the definition of awareness ranged from 1.3 to 2.2, with a mean of 1.67. Overall, findings suggest that expert judges found the items to be good representations of acceptance and awareness.

STUDY 2: FACTOR STRUCTURE AND INTERNAL CONSISTENCY

Method

Participants. Two hundred and four undergraduate students (94 males, 106 females; 4 participants did not indicate gender) in psychology courses served as the development sample in exchange for extra course credit. To increase the likelihood that the sample would be nonclinical, participants currently receiving psychiatric or psychological treatment were excluded. Participants’ ages ranged from 19 to 47 years old, with a mean age of 21.9 years ($SD = 3.83$). Students’ year in school ranged from year 1 to year 7, with a mean year in school of 3.53 (i.e., 65% of students in their third or fourth year of school). Participants’ self-identified race was as follows: 64.7% White/Caucasian/European descent, 18.6% Asian/Pacific Islander, 10.3% Black/African American/Caribbean American, 1.0% Hispanic/Latino/Latina, 5.0% multiracial, and 0.5% “other.”

Measures and Procedure. The 58 retained items were administered in a group format. Given that 5- and 6-point Likert-type scales have been found to be most reliable (McKelvie, 1978), participants rated items on a 5-point Likert-type scale (0 = *never*, 1 = *rarely*, 2 = *sometimes*, 3 = *often*, and 4 = *very often*) according to the frequency that they experienced the described item within the past week.

Results and Discussion

Factor Analysis. Unrestricted and restricted (i.e., forced solution) factor analyses were conducted. An unrestricted factor analysis (i.e., principal axis factoring) using a Promax

(i.e., oblique) rotation initially was conducted to determine item retention. An oblique rotation method was chosen given that it allows the factors to correlate and can provide more meaningful theoretical factors (Netemeyer et al., 2003). The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy was .768, and Bartlett's Test of Sphericity was significant. The unrestricted factor analysis produced a 17-factor solution with eigenvalues greater than one, which recovered 65.9% of the sample variance. However, examination of eigenvalues and the scree plot revealed a marked gap between the first two factors and the remaining factors (Factor 1 eigenvalue = 7.93, Factor 2 eigenvalue = 6.84, Factor 3 eigenvalue = 2.85, Factor 4 eigenvalue = 2.45; the first two factors accounted for 25.5% of the total variation across factors). Floyd and Widaman (1995) argue that the use of eigenvalues greater than one can lead to an overestimation of the number of factors to retain, and that the scree plot may be more useful in identifying meaningful factors. Thus, based on scree plot results and consistent with theoretical predictions, the most interpretable solution was a two-factor model. A factor analysis (i.e., principal axis factoring) using a Promax rotation was conducted again, this time restricting the factor analysis to a two-factor solution. Since loadings above .40 may be considered "more significant" and .50 may be considered "very significant" (Hair, Anderson, Tatham, & Black, 1998), items with loadings of .45 and higher only on their respective subscale were retained, resulting in 25 items (11 acceptance items, 14 awareness items).

Internal Consistency. Reliability analyses (i.e., interitem correlations, corrected item-to-total correlations, and Cronbach's alpha coefficient) were conducted for the remaining items in each subscale. For the Awareness subscale, Cronbach's alpha = .85, and for the Acceptance subscale, Cronbach's alpha = .87, suggesting very good internal consistency for both subscales. For the Awareness subscale, corrected item-subscale total correlations ranged from .38 to .61, and for the Acceptance subscale, corrected item-subscale total correlations ranged from .48 to .72. Interitem correlations also were calculated. For the Awareness subscale, interitem correlations ranged from .06 to .59, and Acceptance subscale interitem correlations ranged from .17 to .66.

Based on these analyses, items were eliminated to ensure that correlations remained within the recommended parameters (i.e., .15 to .50 according to Clark & Watson, 1995) and to retain a maximum of 10 items on each subscale, as 8 to 10 items per dimension has been suggested as an ideal scale length (Netemeyer et al., 2003). Four items were deleted from the Awareness subscale, and one item was deleted from the Acceptance subscale, yielding 10 items on each subscale. Although a combination of

reverse- and nonreverse-scored items were initially generated for both subscales, none of the resulting 10 Awareness subscale items were reverse scored, and all of the resulting 10 Acceptance subscale items were reverse scored. See Table 1 for a list of the final 20 items, the factor loadings of each item for both subscales, and scoring directions.

Reliability analyses were reconducted for each subscale of 10 items to examine the internal consistency of the resulting measure. For the Awareness subscale, Cronbach's alpha = .81, corrected item-subscale total correlations ranged from .43 to .60, and interitem correlations ranged from .13 to .50. For the Acceptance subscale, Cronbach's alpha = .85, item-subscale total correlations ranged from .47 to .67, and interitem correlations ranged from .17 to .54. Only one interitem correlation (i.e., on the Awareness subscale) fell slightly below the recommended parameter of .15, and five interitem correlations (i.e., on the Acceptance subscale) were slightly above the recommended parameter of .50.

STUDY 3: VALIDATION ANALYSES WITH A NORMATIVE STUDENT SAMPLE

Method

Participants

Five hundred fifty-nine university students (270 males, 283 females; 6 participants did not indicate gender) were recruited from undergraduate psychology courses and participated in exchange for extra credit. To increase the likelihood that the sample would be nonclinical, participants currently receiving psychiatric or psychological treatment were excluded. The participants' ages ranged from 17 to 53 years, with a mean age of 20.12 years ($SD = 3.49$). Students' year in school ranged from year 1 to beyond year 5, with a mean year in school of 2.39 (i.e., 59.2% of students in their first or second year of school). Participants' self-identified race was as follows: 64.4% White/Caucasian/European descent, 19.0% Asian/Pacific Islander, 8.1% Black/African American/Caribbean American, 5.4% multiracial, 1.6% Hispanic/Latino/Latina, 0.7% Native American, and 0.7% "other" or race not listed.

Measures and Predictions

The refined 20-item measure (i.e., the PHLMS) was included in a questionnaire packet that also contained the following questionnaires:

MAAS. The MAAS (Brown & Ryan, 2003) is a 15-item self-report inventory designed to measure the presence or

TABLE 1
Factor Loadings of PHLMS Items From the Nonclinical Student Sample (Study 2; N = 204)

	<i>Factor 1 Loading (Awareness)</i>	<i>Factor 2 Loading (Acceptance)</i>
1. I am aware of what thoughts are passing through my mind.	.479	.112
2. I try to distract myself when I feel unpleasant emotions.	-.136	.540
3. When talking with other people, I am aware of their facial and body expressions.	.636	.117
4. There are aspects of myself I don't want to think about.	.020	.614
5. When I shower, I am aware of how the water is running over my body.	.508	.043
6. I try to stay busy to keep thoughts or feelings from coming to mind.	.194	.655
7. When I am startled, I notice what is going on inside my body.	.609	-.036
8. I wish I could control my emotions more easily.	.011	.603
9. When I walk outside, I am aware of smells or how the air feels against my face.	.515	.067
10. I tell myself that I shouldn't have certain thoughts.	-.003	.651
11. When someone asks how I am feeling, I can identify my emotions easily.	.546	.260
12. There are things I try not to think about.	-.061	.660
13. I am aware of thoughts I'm having when my mood changes.	.555	.090
14. I tell myself that I shouldn't feel sad.	-.027	.532
15. I notice changes inside my body, like my heart beating faster or my muscles getting tense.	.580	-.341
16. If there is something I don't want to think about, I'll try many things to get it out of my mind.	-.022	.707
17. Whenever my emotions change, I am conscious of them immediately.	.580	.082
18. I try to put my problems out of mind.	.026	.502
19. When talking with other people, I am aware of the emotions I am experiencing.	.474	.051
20. When I have a bad memory, I try to distract myself to make it go away.	.014	.505

NOTE: All items are rated on a 5-point Likert-type scale (1 = *never*, 2 = *rarely*, 3 = *sometimes*, 4 = *often*, and 5 = *very often*) according to the frequency each item was experienced over the past week. To obtain the Awareness subscale score, all odd items are totaled; higher scores reflect higher levels of awareness. To obtain the Acceptance subscale score, all even items are reverse scored and totaled; higher scores reflect higher levels of acceptance. A copy of the PHLMS can be obtained from the authors.

Bold values highlight the subscale on which the items fall.

absence of attention to and awareness of what is occurring in the present moment. Items are rated on a 6-point Likert-type scale (1 = *almost always* and 6 = *almost never*), and total scores range from 15 to 90, with higher scores indicating greater mindfulness. The MAAS was found to have good internal consistency, with alphas of .82 and .87 in student and adult samples, respectively. The MAAS demonstrated adequate convergent, discriminant, and incremental validity, reliably distinguished mindfulness practitioners from the general adult population, and has predicted mood disturbance and stress during and after a mindfulness-based intervention (Brown & Ryan, 2003). Since the MAAS measures attention and awareness to what is occurring in the present moment, positive correlations were expected to be found between the MAAS and PHLMS Awareness subscale.

Acceptance and Action Questionnaire (AAQ). The AAQ (Hayes et al., 2004) assesses the ability to accept undesirable thoughts and feelings while pursuing desired goals. Nine- and 16-item versions have been developed. Because the authors note that the longer version may be more sensitive owing to the larger number of items (Hayes et al., 2004), the 16-item version was used in the

present study, which has two subscales: Willingness/Acceptance and Action. Items are rated on a 7-point Likert-type scale (1 = *never true* and 7 = *always true*), and total scores range from 16 to 112, with higher scores indicating greater levels of experiential avoidance. The AAQ has demonstrated very good internal consistency, with alphas ranging from .89 to .92 (Bond & Bruce, 2000). Only the AAQ Acceptance subscale was used in analyses in the present research; the AAQ Acceptance subscale was reverse-scored so that larger scores would reflect higher levels of acceptance and thus was expected to correlate positively with the PHLMS Acceptance subscale.

Rumination-Reflection Questionnaire (RRQ). The RRQ (Trapnell & Campbell, 1999) is a 24-item self-report inventory designed to measure two types of self-focus: neurotic and inquisitive/intellective. The measure has two scales: Rumination, assessing neurotic self-consciousness, and Reflection, assessing intellective self-consciousness. Items are rated on a 5-point Likert-type scale (1 = *strongly disagree* and 5 = *strongly agree*). Total Rumination and Reflection scores both range from 12 to 60, so that higher scores indicate higher rumination or reflection. The RRQ demonstrated excellent internal consistency, as alpha

estimates exceeded .90, and the mean interitem correlation exceeded .40 for both scales (Trapnell & Campbell, 1999), as well as good convergent and discriminant validity (Trapnell & Campbell, 1999). Because rumination reflects a difficulty regulating emotion and includes judgmental or evaluative attitudes toward one's thoughts and experiences, a negative correlation was predicted between the RRQ Rumination subscale and PHLMS Acceptance subscale. Since the RRQ Reflection subscale assesses an open and inquisitive self-consciousness, it was expected to be positively related to the PHLMS Awareness subscale.

White Bear Suppression Inventory (WBSI). The WBSI (Wegner & Zanakos, 1994) is a 15-item self-report measure designed to measure thought suppression. Items are rated on a 5-point Likert-type scale (1 = *strongly disagree* and 5 = *strongly agree*), and total scores range from 15 to 75, with higher scores indicating greater tendency to suppress thoughts. The WBSI has been found to have very good internal consistency, ($\alpha = .89$), adequate stability over time (12-week test-retest correlation of $r = .80$) and very good convergent validity (Muris, Merckelbach, & Horselenberg, 1996). Since thought suppression includes an unwillingness to experience thoughts, the correlation between the WBSI and the PHLMS Acceptance subscale was expected to be negative.

Beck Depression Inventory-II (BDI-II). The BDI-II (Beck, Steer, & Brown, 1996; Beck, Ward, Mendelson, Mock, & Erbarugh, 1961) is a 21-item self-report measure of depression that is routinely used in studies of depression and anxiety, and is designed to assess somatic, affective, and cognitive symptoms of depression. Dozois, Dobson, and Ahnberg (1998) established criteria for the BDI-II (0-12 = *nondepressed*; 13-19 = *dysphoric*; 20-63 = *dysphoric-depressed*) based on cutoffs established by Kendall, Hollon, Beck, Hammen, and Ingram (1987) for the BDI. The BDI-II has good psychometric properties (Beck, Steer, Ball, & Ranieri, 1996). Negative correlations were expected between the BDI-II and the PHLMS Acceptance subscale; however, no specific predictions were made related to the PHLMS Awareness subscale, as increased awareness has been associated with both positive and negative outcomes.

Beck Anxiety Inventory (BAI). The BAI (Beck & Steer, 1993) is a 21-item self-report measure that is routinely used to measure symptoms of anxiety. Items are rated on a 4-point Likert-type scale (0 = *not at all* and 3 = *severely*). Cutoff scores listed in the BAI manual are: 0-7 = *minimal*; 8-15 = *mild*; 16-25 = *moderate*; 26-63 = *severe*. The BAI has good psychometric properties (Beck, Epstein, Brown, & Steer, 1988; Dent & Salkovskis, 1986; Frydrich, Dowdall, & Chambless, 1992). Normative percentile scores have also been established (Gillis, Haaga, & Ford, 1995). Similar predictions as to the BDI-II were made.

Marlow-Crowne Social Desirability Scale (M-C SDS). The M-C SDS (Crowne & Marlowe, 1960) is a 33-item true/false measure that assesses response bias (i.e., the degree to which individuals attempt to present themselves in a favorable light). Scores range from 0 to 33, with higher scores reflecting a greater degree of socially desirable responding. The M-C SDS has high internal consistency ($\alpha = .88$) and test-retest reliability ($r = .89$; Crowne & Marlowe, 1960, 1964). Because true-false and Likert forms of the M-C SDS have been found to be significantly correlated (Greenwald & O'Connell, 1970), a 5-point Likert version of the M-C SDS was used in the present study to achieve higher precision and to increase the instrument's sensitivity. Scores on the M-C SDS were expected to show either no or a modest relationship with the PHLMS subscales based on previous studies examining the relationship between mindfulness and social desirability (e.g., Brown & Ryan, 2003) and impression management (e.g., Baer et al., 2004).

Results

Descriptive Findings. To account for the large number of correlations calculated using this sample and in an effort to balance Type I and Type II error, only those correlations with $p < .01$ were deemed significant. There was not a significant relationship between the Awareness and Acceptance subscales ($r = -.10$, $p = .025$). Because there was no relationship between the two subscales, subsequent analyses only examine the psychometric properties for the subscales (i.e., no total score is obtained).

The PHLMS Awareness subscale scores ranged from 20 to 50, with a mean of 36.65 ($SD = 4.93$), and the PHLMS Acceptance subscale scores ranged from 13 to 47, with a mean of 30.19 ($SD = 5.84$). The mean BDI-II total score of 9.66 ($SD = 7.15$, range = 0 to 40) and mean BAI total score of 10.32 ($SD = 8.78$, range = 0 to 49) were within normative ranges.

Cross-Validation. Cross-validation analyses were conducted between the first student sample (i.e., Study 2 development sample, $n = 204$) and the second student sample (i.e., Study 3 validation sample, $n = 559$). No significant differences were found for gender ($\chi^2[1, N = 753] = .20$, $p = .658$) or race ($\chi^2[6, N = 752] = 2.93$, $p = .818$). However, the development sample was older ($t[761] = 6.07$, $p < .0001$) and higher in its overall years in school ($\chi^2[6, N = 753] = 150.70$, $p < .0001$). However, no significant differences were found between both samples for the PHLMS Awareness subscale ($t[761] = -1.13$, $p > .05$) or the PHLMS Acceptance subscale ($t[761] = -.67$, $p > .05$).

Confirmatory Factor Analysis (CFA). Confirmatory factor analyses using maximum likelihood estimation

TABLE 2
Summary of CFA Results From Nonclinical Student Sample (Study 3)

<i>Model</i>	<i>df</i>	χ^2	<i>CFI</i>	<i>RMSEA</i>
Calibration sample (<i>N</i> = 279)				
Two-factor model	169	279.48*	.90	.05
Two-factor model with correlated error	164	245.57*	.93	.04
CFA validation sample (<i>N</i> = 280)				
Two-factor model with correlated error	164	263.62*	.91	.05

NOTE: *df* = degrees of freedom; χ^2 = chi-square statistic; CFI = Comparative Fit Index; RMSEA = root mean square error of approximation.

**p* < .001.

performed in Mplus Version 3.01 (Muthén & Muthén, 1998-2004) were completed to test the relative fit of the theoretically based two-factor model. Three fit indices for these analyses were examined: relative chi-square (χ^2/df) as an informal measure of fit, the Comparative Fit Index (CFI) as an index of relative fit, and root mean square error of approximation (RMSEA) as a noncentrality-based index. Minimum values of .90 for CFI conventionally indicate acceptable fit (Bentler & Bonett, 1980), and an RMSEA value less than .05 indicates close fit (Browne & Cudeck, 1993). Although there is no consensus on what relative χ^2 value constitutes a good fit, relative χ^2 less than 3.00 are recommended (Kline, 1988). Because problems with the χ^2 statistic have been noted (e.g., La Du & Tanaka, 1989), χ^2 results are reported only to facilitate comparison between models.

Data from this sample (*n* = 559) were randomly divided into two subsamples (calibration data sample, *n* = 279; CFA validation sample, *n* = 280) for cross-validation purposes. Results from the tested factor structures are shown in Table 2. Based on the exploratory factor analysis findings in Study 2, the two-factor model (Awareness and Acceptance) first was tested using the calibration data sample (*N* = 279). This two-factor model marginally fit the data: χ^2/df = 1.7, CFI = .90, RMSEA = .05 (90% confidence interval: .04 to .06). The modification indices were used to determine the best fitting, theoretically logical model for the data. Error was correlated for the following three sets of items to examine whether the fit improved: items 5 and 9 (both measure awareness of external sensations); items 7 and 15 (both measure awareness of internal sensations); and items 10, 12, and 16 (all measure acceptance of thoughts). Results from the two-factor model with correlated error terms suggested an acceptable fit to the data: χ^2/df = 1.5, CFI = .93, and RMSEA = .04 (90% confidence interval: .03 to .05). Awareness and Acceptance did not correlate significantly (r = -.02, p > .05), and the loadings of awareness and acceptance items were all significant at the p < .001 level. Since the model specifying correlated error terms was better fitting than the model with uncorrelated error terms, it suggests that the specified items may correlate related to their common

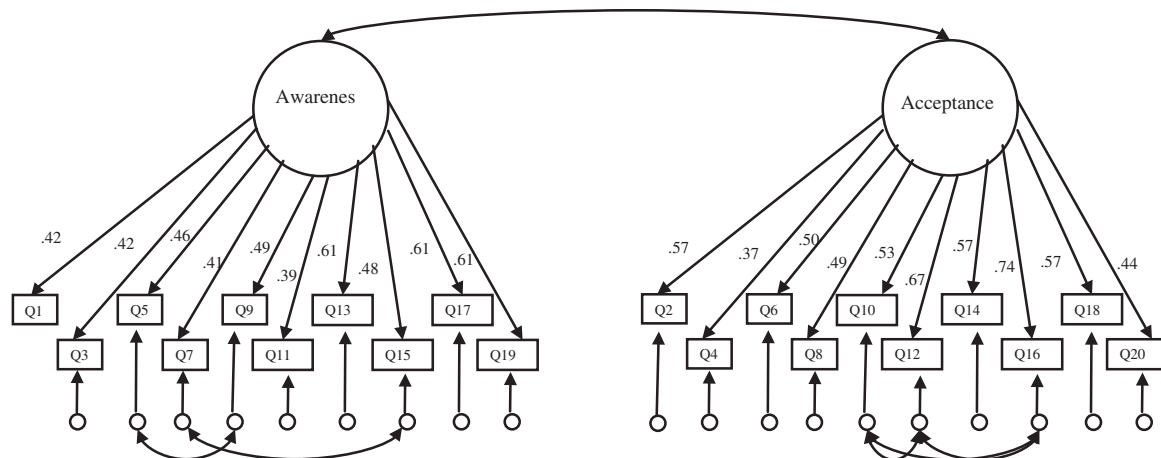
factor (i.e., awareness or acceptance) and to shared unmeasured variance (e.g., awareness of internal sensations; acceptance of thoughts).

Finally, the same two-factor model with correlated error terms was tested in CFA validation sample (*n* = 280) for cross-validation. The fit indices supported this model: χ^2/df = 1.6, CFI = .91, RMSEA = .05 (90% confidence interval: .04 to .06). Awareness and Acceptance did not correlate significantly (r = -.02, p > .05), and the loadings of awareness and acceptance items were all significant at the p < .001 level. This model is depicted in Figure 1.

Internal Consistency. Reliability analyses (i.e., interitem correlations, corrected item-to-total correlations, and Cronbach's alpha coefficient) were conducted for each subscale. Internal consistency was respectable for the Awareness subscale (Cronbach's alpha = .75) and very good for the Acceptance subscale (Cronbach's alpha = .82). Corrected item-to-total correlations were conducted within each subscale. For the Awareness subscale, corrected item-subscale total correlations ranged from .34 to .51, and for the Acceptance subscale, corrected item-subscale total correlations ranged from .40 to .64. Interitem correlations were generally within the recommended parameters; for the Awareness subscale interitem correlations ranged from .13 to .36, and Acceptance subscale interitem correlations ranged from .17 to .53.

Convergent and Discriminant Validity. Correlations between the PHLMS subscales and the other measures were conducted to assess for convergent and discriminant validity and can be seen in Table 3. To account for the large number of correlations calculated using this sample and in an effort to balance Type I and Type II error, only those with p < .01 were deemed significant. As shown in Table 3, the PHLMS Awareness subscale, correlated significantly with awareness/attention and reflection. The PHLMS Acceptance subscale was significantly correlated in a positive direction with acceptance/willingness, and in a negative direction with thought suppression and rumination. An unexpected finding was that the MAAS was correlated more strongly with the PHLMS Acceptance subscale than with the

FIGURE 1
Two-Factor Model of Mindfulness for CFA Validation Sample ($N = 280$) in Study 3



PHLMS Awareness subscale; however, the correlations were not significantly different in magnitude at the $p < .01$ level ($t[556] = 1.91, p = .057$). With regard to discriminant validity, the correlation between the PHLMS Awareness subscale and social desirability was not statistically significant at the $p < .01$ level. However, social desirability was weakly and negatively correlated with the PHLMS Acceptance subscale, indicating higher acceptance is weakly associated with less social desirability.

Relationship to Measures of Psychopathology. As shown in Table 3, only the PHLMS Acceptance subscale was related to depression and anxiety (i.e., higher acceptance was associated with less depression and anxiety symptoms). Partial correlations were conducted between the PHLMS subscale scores and the measures of depression and anxiety, controlling for social desirability (i.e., M-C SDS). After controlling for social desirability, there continued to be no relationship between depression ($pr = -.05, p = .202$) and anxiety ($pr = .04, p = .317$) and the PHLMS Awareness subscale. The relationship between the PHLMS Acceptance subscale and both depression ($pr = -.33, p < .001$) and anxiety ($pr = -.32, p < .001$) remained significant.

Discussion

Results from the CFA support a two-factor solution, with awareness and acceptance items loading onto their respective subscales, and these two factors were not correlated. The results reveal adequate to good internal consistency for both subscales, and convergent and

discriminant validation analyses generally yielded expected results. Higher scores on the PHLMS Awareness subscale were associated with higher levels of reflection and mindful awareness/attention, and higher scores on the PHLMS Acceptance subscale related to higher levels of acceptance and lower levels of thought suppression and rumination. Furthermore, the PHLMS Awareness subscale was not found to be related to depression or anxiety, whereas the PHLMS Acceptance subscale was negatively related to both measures of psychopathology (i.e., depression and anxiety), and these relationships were retained after controlling for social desirability.

STUDY 4: VALIDATION ANALYSES WITH A GENERAL PSYCHIATRIC CLINICAL SAMPLE

Method

Participants. Fifty-two clinical patients (23 males, 29 females) were recruited from an urban outpatient psychiatry clinic and participated in exchange for monetary compensation (\$5.00). The participants' ages ranged from 18 to 80 years old, with a mean age of 40.78 years ($SD = 12.04$). Participants' self-identified race was as follows: 67.3% Black/African American/Caribbean American, 19.2% White/Caucasian/European descent, 7.7% Hispanic/Latino/Latina, and 5.8% multiracial. Most participants were never married (42.3%) or divorced/annulled (30.8%), did not receive education beyond 12th grade (65.4%), and were either on disability (51.9%) or were unemployed (28.8%).

TABLE 3
Correlations of the PHLMS With Other Measures in Three Samples

Measure	Nonclinical Student Sample (Study 3; N = 559)				General Psychiatric Clinical Sample (Study 4; N = 52)				Student Counseling Center Sample (Study 6; N = 78)			
	PHLMSaw		PHLMSac		PHLMSaw		PHLMSac		PHLMSaw		PHLMSac	
	r	p	r	p	r	p	r	p	r	p	r	p
AAQ	.10	.024	.54	.000	.07	.641	.31	.025	—	—	—	—
MAAS	.21	.000	.32	.000	.40	.004	.17	.220	—	—	—	—
WBSI	-.03	.499	-.52	.000	-.16	.261	-.35	.012	—	—	—	—
RRQ reflection	.36	.000	-.02	.641	.27	.054	-.07	.652	—	—	—	—
RRQ rumination	-.02	.622	-.40	.000	-.05	.708	-.43	.002	—	—	—	—
M-C SDS	-.10	.020	-.13	.025	-.19	.186	-.15	.309	—	—	—	—
BDI-II	-.08	.056	-.35	.000	-.25	.075	-.28	.049	.08	.513	-.51	.000
BAI	.03	.538	-.33	.000	-.27	.057	-.29	.040	.14	.228	-.39	.000
BHS	—	—	—	—	—	—	—	—	-.12	.287	-.49	.000
SHS	—	—	—	—	—	—	—	—	.17	.146	.33	.004
QOLI	—	—	—	—	—	—	—	—	-.01	.955	.42	.000

NOTE: PHLMSaw = Philadelphia Mindfulness Scale Awareness subscale; PHLMSac = Philadelphia Mindfulness Scale Acceptance subscale; AAQ = Acceptance and Action Questionnaire; MAAS = Mindful Attention Awareness Scale; WBSI = White Bear Suppression Inventory; RRQ = Rumination-Reflection Questionnaire; M-C SDS = Marlow-Crowne Social Desirability Scale; BDI-II = Beck Depression Inventory-II; BAI = Beck Anxiety Inventory; BHS = Beck Hopelessness Scale; SHS = Subjective Happiness Scale; QOLI = Quality of Life Inventory.
 Significant correlations ($p < .01$) are in bold.

Diagnostic information was obtained from medical records. One caveat related to the diagnostic information is that structured clinical interviews were not conducted; instead, patients' diagnoses were made by their primary therapist (i.e., psychiatrist, licensed clinical psychologist, licensed clinical social worker, or master's-level clinician supervised by a licensed clinical psychologist) and should therefore be regarded with appropriate caution. Regarding participants' clinical diagnosis, 66.7% had a primary diagnosis of a Mood Disorder, 10.4% had a primary diagnosis of a Psychotic Disorder, 8.3% had an Anxiety Disorder, 8.3% had a primary diagnosis of a Substance-Related Disorder, and remaining participants had another Axis I disorder. More than half (54.2%) of the sample had at least one comorbid Axis I diagnosis. Axis II diagnoses were deferred for 79.2% of the participants. Participants having at least one condition listed on Axis III accounted for 85.4%, and all but one participant had at least one psychosocial stressor listed on Axis IV. In sum, the clinical sample largely consisted of ethnic/racial minority participants with chronic mental illness and multiple physical and psychosocial stressors who did not have higher than a high school education and were not currently employed.

Measures and Predictions. The same measures and predictions were used as in Study 3.

Results

Descriptive Findings. Consistent with the nonclinical student sample (Study 3), there was not a significant relationship between the Awareness and Acceptance subscales ($r = -.13$, $p = .357$). The PHLMS Awareness subscale total score ranged from 22 to 50, with a mean of 35.11 ($SD = 5.39$), and the PHLMS Acceptance subscale total score ranged from 12 to 37, with a mean of 24.62 ($SD = 5.48$). The mean BDI-II total score of 24.0 ($SD = 15.86$, range = 0 to 51) can be classified as "dysphoric-depressed" and the mean BAI total score of 20.7 ($SD = 16.25$, range = 0 to 62) is classified as "moderate."

Internal Consistency. Reliability analyses (i.e., inter-item correlations, corrected item-to-total correlations, and Cronbach's alpha coefficient) were conducted for each subscale. Internal consistency was respectable for the Awareness (Cronbach's alpha = .75), and Acceptance (Cronbach's alpha = .75) subscales. For the PHLMS Awareness subscale, corrected item-subscale total correlations ranged from .10 to .62, and for the Acceptance subscale, corrected item-subscale total correlations ranged from .23 to .65. Interitem correlations for the PHLMS Awareness subscale ranged from .01 to .60, and for the PHLMS Acceptance subscale, interitem correlations ranged from -.04 to .57. The low end of the range for both

subscales was quite small, reflecting validity shrinkage, which can be expected during cross-validation and application of models to new samples (Anastasi & Urbina, 1997).

Convergent and Discriminant Validity. Correlations between the PHLMS subscales and others measures were conducted to assess for convergent and discriminant validity and can be seen in Table 3. To account for the large number of comparisons calculated using this sample, only those reaching an alpha level of $p < .01$ were deemed significant. The PHLMS Awareness subscale moderately correlated with mindful awareness/attention, but there was not a significant association with reflection. The PHLMS Acceptance subscale was found to moderately negatively correlate with rumination and thought suppression. Although the PHLMS Acceptance subscale was moderately correlated with the AAQ Acceptance subscale, this result did not quite reach the predetermined significance level of $p < .01$. Regarding discriminant validity, scores on the PHLMS Awareness and Acceptance subscales were not significantly related to social desirability.

Relationship to Measures of Psychopathology. As shown in Table 3, neither PHLMS subscale was found to be related at the $p < .01$ level with depression or anxiety. Furthermore, the relationship between the PHLMS Awareness subscale and both depression ($r = -.20, p = .179$) and anxiety ($r = -.21, p = .159$) as well as between the PHLMS Acceptance subscale and both depression ($r = -.22, p = .136$) and anxiety ($r = -.22, p = .136$) remained nonsignificant after controlling for social desirability.

Comparison With Nonclinical Student Sample. Preliminary analyses were first conducted to identify demographic differences between the clinical and normative student ($n = 559$) samples. No differences for gender were found ($\chi^2[1, N = 605] = .40, p = .525$). However, there were significant differences between the samples for race ($\chi^2[6, N = 610] = 162.27, p < .0001$), as the majority of participants in the student sample were White and the majority of participants in the clinical sample were Black/African American/Caribbean American. The clinical participants also were significantly older than the student participants ($t[50.8] = -12.21, p < .0001$). As expected, the clinical sample was significantly more depressed ($t[51.9] = -7.09, p < .0001$) and anxious ($t[53.54] = -4.89, p < .0001$) than the normative student sample.

Analyses were conducted between the normative student and clinical samples to examine differences in responses. As expected, significant differences were found between the student and clinical samples for the PHLMS Awareness ($t[609] = 2.14, p < .05, d = .30$) and Acceptance ($t[609] = 6.62, p < .0001, d = .98$) subscales, with student participants

showing higher levels of awareness (PHLMS Awareness subscale mean difference of 1.54) and acceptance (PHLMS Acceptance subscale mean difference of 5.57). A 2 (sample) by 2 (subscale) mixed analysis of variance (ANOVA) was conducted to examine if the difference between the student and clinical samples was larger for the Acceptance subscale than the Awareness subscale. Significant main effects for group ($F[1, 609] = 213.44, p < .0001$) and subscale ($F[1, 609] = 45.58, p < .0001$) were found. Furthermore, the interaction was significant ($F[1, 609] = 12.06, p = .001$), indicating that the magnitude of the difference between the clinical and nonclinical mean acceptance scores was significantly larger than the difference between the samples' mean awareness scores.

Discussion

The PHLMS showed adequate internal consistency within a clinical sample of mixed psychiatric patients. As with the student sample, the PHLMS Awareness and Acceptance subscales were not correlated with one another. Correlations with related measures provided mixed support for convergent and discriminant validity within this sample. Higher scores on the PHLMS Awareness subscale were associated with higher mindful attention/awareness, and higher scores on the PHLMS Acceptance subscale were found to be related to less thought suppression and rumination. Statistically significant relationships were not found between the PHLMS subscales and measures of psychopathology. Although the magnitudes of the correlations between acceptance and depression/anxiety were similar to those in the student normative sample from Study 3, the size of the correlations between awareness and depression/anxiety were much larger in the clinical sample than in the nonclinical sample.

Finally, significant differences on the PHLMS and its subscales were found between nonclinical and clinical participants, indicating that the measure can distinguish between groups expected to differ in levels of awareness and acceptance.

STUDY 5: VALIDATION ANALYSES WITH AN EATING DISORDERS SAMPLE

Method

Participants. Thirty patients (27 female, 3 male) were recruited from an eating disorders unit at an urban inpatient psychiatric hospital. Participants' ages ranged from 18 to 54 with a mean age of 30.0 ($SD = 10.60$). The majority of participants self-identified as White/Caucasian (90%).

Similar to Study 4, diagnostic information was obtained from medical records; all diagnoses were made at intake by a psychiatrist who was the unit medical director. All participants had a primary Axis I diagnosis of an eating disorder (i.e., anorexia nervosa, bulimia nervosa, or eating disorder not otherwise specified [NOS]), and 93% had a comorbid Axis I disorder (i.e., bipolar disorder, major depressive disorder, or posttraumatic stress disorder). Only one participant had a comorbid Axis II diagnosis (borderline personality disorder), and 83.3% had an Axis III condition.

Measures and Predictions. The PHLMS was administered. It was predicted that participants would show higher levels of awareness and lower levels of acceptance in comparison to the normative student sample from Study 3.

Results and Discussion

Descriptive Findings. Consistent with Studies 3 and 4, there was not a significant relationship between the Awareness and Acceptance subscales ($r = -.02, p = .934$). The PHLMS Awareness subscale total score ranged from 22 to 50, with a mean of 35.70 ($SD = 6.85$), and the PHLMS Acceptance subscale total score ranged from 10 to 48, with a mean of 22.47 ($SD = 8.57$). Results indicated very good internal consistency for the PHLMS Awareness (Cronbach's $\alpha = .85$) and Acceptance (Cronbach's $\alpha = .90$) subscales.

Comparison With Nonclinical Student Sample. Preliminary analyses first were conducted to identify demographic differences between the clinical and normative student samples ($n = 559$). There were significant differences between the samples in gender ($\chi^2[1, N = 583] = 17.23, p < .0001$) and race ($\chi^2[6, N = 586] = 15.01, p < .0001$). The clinical participants also were significantly older than the student participants ($t[29.3] = 5.07, p < .0001$).

Analyses then were conducted between the student normative and eating disorder inpatient samples to examine differences in responses. There was not a significant difference in levels of awareness between both samples ($t[30.6] = -0.75, p = .461$; PHLMS Awareness subscale mean difference of .95). However, as expected, significant differences were found between the student and clinical sample for the PHLMS Acceptance subscale ($t[30.5] = -4.87, p < .0001$), with eating disorder participants showing lower levels of acceptance (PHLMS Acceptance subscale mean difference of 7.72). These results are consistent with those from Study 4, suggesting that awareness and acceptance can be measured independently and that the acceptance component of mindfulness may play a unique role in mental health.

STUDY 6: VALIDATION ANALYSES WITH A STUDENT COUNSELING CENTER SAMPLE

Method

Participants. Seventy-eight graduate students (69 female, 9 male) in health professional programs seeking psychotherapy at a university student counseling center were recruited during the initial intake evaluation. Participants' ages ranged from 18 to 49 with a mean age of 25.5 ($SD = 7.77$). Participants' self-identified race was as follows: 6.0% Asian American, 61.5% White/Caucasian, 11.6% Black/African American, and 7.6% multiracial or "other." Similar to Studies 4 and 5, diagnostic information was obtained from medical records, so participants' diagnoses were made by their therapist (i.e., master's-level clinical doctoral students supervised by licensed clinical psychologists). Forty-two percent of participants had a primary diagnosis of an anxiety disorder, 28.9% of a mood disorder, 7.9% had another primary Axis I disorder (e.g., trichotillomania, adjustment disorder), and 21.1% had no diagnosis on Axis I.

Measures and Predictions. The PHLMS was included in a questionnaire packet that also contained the BDI-II (Beck, Steer, Ball, et al., 1996) and the BAI (Beck & Steer, 1993); predictions similar to those in Studies 3 and 4 were made for these measures. Other measures in the questionnaire packet included:

Beck Hopelessness Scale (BHS). The BHS (Beck & Steer, 1988) is a widely used 20-item true-false self-report measure designed to assess positive and negative beliefs and feelings about the future. Items are scored 0 or 1, and a total score is calculated by summing the pessimistic responses; total scores range from 0 to 20, with higher scores reflecting greater hopelessness. The BHS has excellent internal consistency (KR-20 coefficients ranging from .82 to .93) and concurrent validity is well established across a wide variety of samples (e.g., Beck, Steer, Beck, & Newman, 1993; Mann, Waternaux, Haas, & Malone, 1999). A negative correlation was expected between the BHS and the PHLMS Acceptance subscale; however, no specific predictions were made related to the PHLMS Awareness subscale, as increased awareness has been associated with both positive and negative outcomes.

Subjective Happiness Scale (SHS). The SHS (Lyubomirsky & Lepper, 1999) is a 4-item scale of global subjective happiness measuring the extent that one is a happy person (1 = *not a very happy person* and 7 = *a very happy person*), how happy one is compared to one's peers (1 = *less happy* and 7 = *more happy*), and the extent to which one is generally very happy and generally not very happy (1 = *not at all* and 7 = *a great deal*). The SHS has

shown to have high internal consistency (alpha ranging from .79 to .94), good to excellent test-retest reliability over a period of 1 month ($r = .90$) and 1 year ($r = .55$), and good construct validity (Lyubomirsky & Lepper, 1999). A positive correlation was expected between the SHS and the PHLMS Acceptance subscale.

Quality of Life Inventory (QOLI). The QOLI (Frisch, Cornell, Villanueva, & Retzlaff, 1992) is a self-report measure of life satisfaction designed to complement symptom-oriented measures. For each life domain, the importance of a particular domain is first rated on a 4-point Likert-type scale (0 = *not important* and 2 = *extremely important*) followed by satisfaction with that domain on a 7-point Likert-type scale (−3 = *very dissatisfied* and 3 = *very satisfied*). The QOLI shows good internal consistency (coefficients ranged from .77 to .89) and stability over time (test-retest coefficients ranged from .80 to .91). A mean QOLI score was used in the present study to reflect an overall life quality and satisfaction across a variety of life domains. The mean represents the average of responses to the satisfaction items that were weighted according to rated importance (i.e., domains ranked low on importance did not contribute as much as domains ranked high on importance to the mean QOLI score). A positive correlation was expected between the QOLI and the PHLMS Acceptance subscale; no specific predictions were made related to the PHLMS Awareness subscale.

KIMS. The KIMS (Baer et al., 2004) was used to examine concurrent validity and was chosen because it is a trait measure developed using a multidimensional conceptualization of mindfulness. The KIMS is a self-report inventory that yields a total score and four subscale scores of mindfulness skills: Observe (i.e., noticing or attending to both internal and external phenomena), Describe (i.e., labeling or noting observed phenomena), Act with Awareness (i.e., focusing on one thing at a time), and Accept with Nonjudgment (i.e., having a nonevaluative stance about present-moment experience). It consists of 39 items that are rated on a 5-point Likert-type scale ranging from 1 (*never or very rarely true*) to 5 (*almost always or always true*). The measure was found to have high internal consistency, adequate to good test-retest reliability, and validation analyses providing support for the relationship between mindfulness and mental health (Baer et al., 2004). The PHLMS Awareness subscale was predicted to be most related to the KIMS Observe subscale, and the PHLMS Acceptance subscale was predicted to be most related to the KIMS Accept with Nonjudgment subscale.

The Clinical Global Impression Scale (CGI). A clinician-rated assessment was used to further examine convergent validity (Guy, 1976). The CGI was designed to assess the current global severity of illness and is widely used in

psychopharmacology trials (Zaider, Heimberg, Fresco, Schneier, & Liebowitz, 2003). Clinicians rated illness severity on a 7-point Likert-type scale (1 = *not at all ill*, 2 = *borderline mentally ill*, 3 = *mildly ill*, 4 = *moderately ill*, 5 = *markedly ill*, 6 = *severely ill*, and 7 = *extremely ill*) after the initial intake interview. Higher levels of acceptance on the PHLMS Acceptance subscale were predicted to be related to less severe symptoms; however, no specific predictions were made related to the PHLMS Awareness subscale because of the mixed findings in the literature and in the present research.

Results and Discussion

Descriptive Findings. The PHLMS Awareness subscale scores ranged from 21 to 50, with a mean of 34.7 ($SD = 6.8$), and the PHLMS Acceptance subscale scores ranged from 13 to 50, with a mean of 30.2 ($SD = 8.0$). Consistent with Studies 3 through 5, there was not a significant relationship between the PHLMS Awareness and Acceptance subscales ($r = -.06$, $p = .627$). Results indicated very good internal consistency for the PHLMS Awareness (Cronbach's $\alpha = .86$) and Acceptance (Cronbach's $\alpha = .91$) subscales. The mean BDI-II total score of 11.5 ($SD = 11.11$, range = 0 to 59) can be classified as "nondepressed" and the mean BAI total score of 8.6 ($SD = 9.48$, range = 0 to 40) is classified as "mild."

Convergent Validity. Correlations between the PHLMS subscales and the BDI-II, BAI, BHS, SHS, and QOLI were conducted (Table 3). To account for the large number of comparisons calculated using this sample, only those reaching an alpha level of $p < .01$ were deemed significant. The PHLMS Awareness subscale did not correlate with any of these measures. The PHLMS Acceptance subscale was found to moderately negatively correlate with depression, anxiety, and hopelessness, and moderately positively correlate with happiness and quality of life.

Hierarchical regression analyses were conducted to examine the predictive value of the PHLMS and KIMS subscales with respect to clinician-rated global severity of symptoms (CGI). Two regression analyses (Table 4) were conducted in which the measures' subscales were entered simultaneously as predictors and the clinician rating was the dependent variable. In the first analysis, the PHLMS Awareness subscale was not a significant predictor, whereas the PHLMS Acceptance subscale significantly predicted clinical severity. In the second analysis, none of the KIMS subscales were significant predictors of clinical severity.

Concurrent Validity. As expected, the PHLMS Awareness subscale most strongly correlated with the KIMS Observe subscale ($r = .83$, $p < .001$), and the PHLMS

TABLE 4
Hierarchical Regression Analyses Examining the PHLMS and KIMS Subscales as Predictors of
Illness Severity (CGI Ratings) From Study 6 (*N* = 78)

<i>Subscales</i>	<i>B</i>	<i>SE</i>	<i>b</i>	<i>t</i>	<i>p</i>	<i>95% CI</i>
Analysis 1						
PHLMS awareness	-.01	.029	-.04	-.26	.795	-.07 to .05
PHLMS acceptance	-.10	.030	-.49	-3.36	.002	-.16 to -.04
Analysis 2						
KIMS observe	-.04	.025	-.28	-1.58	.123	-.09 to .01
KIMS accept with nonjudgment	-.06	.032	-.35	-1.80	.081	-.13 to .01
KIMS act with awareness	-.01	.044	-.04	-.23	.823	-.10 to .08
KIMS describe	.03	.048	.13	.69	.497	-.06 to .13

NOTE: *B* = unstandardized beta coefficient; *SE* = standard error of the coefficient; *b* = standardized beta coefficient; *CI* = confidence interval for *B*.

Acceptance subscale most strongly correlated with the KIMS Accept with Nonjudgment subscale ($r = .79, p < .001$). Furthermore, even though the KIMS Act with Awareness subscale assesses an aspect of awareness (i.e., focusing on one thing at a time), it did not significantly correlate with the PHLMS Awareness subscale ($r = .02, p = .875$). Although the PHLMS Awareness and Acceptance subscales were not related ($r = -.06, p = .627$), the correlation between the corresponding KIMS subscales (i.e., Observe and Accept with Nonjudgment, respectively) was much stronger and approached statistical significance ($r = -.22, p = .056$). Taken together, the results from Study 6 support the role of acceptance in psychopathology and mental health, and suggest that although the PHLMS and KIMS both measure awareness and acceptance, the PHLMS is better able to measure these constructs independently.

GENERAL DISCUSSION

The purpose of the present project was to develop and provide initial validation of a brief, theoretically based self-report measure that assesses two key components of mindfulness. The psychometric evidence suggests that the PHLMS adequately measures these key constituents, present-moment awareness and acceptance. Content validation by expert judges, recognized researchers of mindfulness and related constructs, yielded high ratings of the representativeness of the items as components of mindfulness. A clear two-factor solution was demonstrated in the initial nonclinical student sample and confirmed in a second nonclinical sample. Furthermore, good internal consistency was demonstrated in both nonclinical and clinical samples.

Relationships Between the PHLMS Subscales and Other Constructs

Relationships with other constructs were largely as expected within the normative nonclinical sample. The PHLMS Awareness subscale was positively related to

measures of awareness/attention and reflection, and the PHLMS Acceptance subscale was found to be positively related to another measure of acceptance and negatively related to rumination and thought suppression. Although relationships with other constructs were largely as expected within the normative sample, there was mixed support from the results of the clinical samples. The only significant relationship for the PHLMS Awareness subscale was in the general psychiatric sample, where higher levels of awareness were associated with higher scores on the MAAS, a measure of mindful awareness. Higher scores on the PHLMS Acceptance subscale were associated with less rumination in the general psychiatric sample, less depression, anxiety, and hopelessness, more happiness, and better ratings of quality of life in the student counseling center sample, and only the PHLMS Acceptance subscale was a significant predictor of illness severity (Study 6). Furthermore, although the correlations between the PHLMS subscales and measures of psychopathology (i.e., depression and anxiety) were not significant in the general psychiatric sample, the magnitudes of the correlations were similar to those of the nonclinical student sample (Study 3) for acceptance and much larger for awareness. Taken together, the results support the role of acceptance in psychopathology and suggest that levels of awareness may be important as well. However, there are limitations to these results that reduce confidence in these findings. The small size of the general psychiatric clinical sample may have reduced the power to detect significant results between the PHLMS subscales and other constructs, including the mental health variables. The sample may have lacked sufficient range in psychiatric severity, and/or the scope of the measures may have been too limited to measure general psychopathology or mental health. For example, results indicate that the clinical participants in Study 4 only had moderate levels of anxiety, and only 50% of the sample had a diagnosis of a mood and/or anxiety disorder. Future research should consider examining more inclusive inventories of psychiatric symptoms in larger samples.

Differences Between the Nonclinical and Clinical Samples

Significant differences were found between the nonclinical and clinical samples as expected. Comparison of these groups showed significantly lower scores of awareness and acceptance in the general psychiatric sample and significantly less acceptance in the eating disorders sample, which is consistent with other findings relating these constructs to mental health. For example, Baer et al. (2004) found that individuals with borderline personality disorder scored significantly lower on Describe, Act with Awareness, and Accept with Nonjudgment subscales than the student sample. Although lower levels of mindfulness (and its components) have been found in clinical populations, and increases have been linked to symptom reduction and increased well-being, the reason for these findings remains unclear and is a question for future research to address.

Relationships Between the PHLMS and Other Measures of Mindfulness

An interesting finding was the relationship between the PHLMS Acceptance subscale and the MAAS, which was slightly stronger than the relationship between the PHLMS Awareness subscale and the MAAS. Brown and Ryan (2003, 2004) created the MAAS to be a dispositional measure of mindfulness, which they conceptualize to be an open or receptive attention to and awareness of ongoing events and experience. These authors initially developed a measure of mindfulness with two factors similar to the factors tapped by the PHLMS: presence (i.e., attention/awareness) and acceptance. However, their validation analyses showed that the acceptance factor did not provide explanatory advantage over that shown by the presence factor alone, which led them to conclude that acceptance, as a distinct construct, is redundant in mindfulness. Therefore, items from the presence factor only were used to form the MAAS. Although Brown and Ryan (2003) state that items with attitudinal components (e.g., acceptance, empathy, trust) were purposefully excluded in the presence factor, the presence and acceptance factors were moderately correlated in the .20 to .35 range across several samples (Brown & Ryan, 2004). Thus, although the face validity of the items suggests that the MAAS only measures awareness/attention, MAAS items may actually reflect an *accepting* awareness. On the other hand, the PHLMS subscales were not correlated, suggesting that acceptance and awareness can be conceptualized as separate constituents of mindfulness and can be examined independently.

Although the MAAS measures mindfulness in a one-dimensional manner, the KIMS (Baer et al., 2004) uses a multidimensional conceptualization of mindfulness. Both the PHLMS and the KIMS measure the two key components of mindfulness, awareness and acceptance, outlined in definitions proposed by Kabat-Zinn (1994) and Bishop and colleagues (2004), although the KIMS contains additional elements that the definitions do not explicitly incorporate. Results from the present project showed that the PHLMS Awareness and Acceptance subscales correspond with two KIMS subscales (i.e., Observe and Accept with Nonjudgment, respectively). However, the PHLMS is unique in that it consistently (i.e., across one nonclinical and three clinical samples) measured these two components *independently*. The KIMS Observe and Accept subscales showed a modest correlation that approached significance in Study 6, and Baer and colleagues (2004) likewise reported a significant modest correlation between these two subscales ($r = -.19, p < .01$ in Study 2). Thus, although the PHLMS and KIMS appear to overlap to some degree, their psychometric properties suggest that they may have different purposes. For example, to measure skills that engender mindfulness, such as labeling one's experience, attending to a variety of stimuli, or engaging in one's activity fully, without needing to separate the effects of one skill from another, the KIMS may be the measure of choice. On the other hand, the PHLMS provides a means to deconstruct mindfulness and independently assess its two key components, because the degree to which changes in either key component tend to impact changes in the other is still an open question. Both present-moment awareness and acceptance have been noted as potential mechanisms of change in mindfulness interventions and the recommendation of dismantling the construct and studying the effects of each aspect has been proposed (Roemer & Orsillo, 2003); the PHLMS provides the means to do so.

In addition to its having subscales that are orthogonal, the PHLMS may offer an advantage in capturing the core components of mindfulness in an efficient manner and without subscales that are less central to the construct. The PHLMS is shorter (20 items) and thus can be administered more quickly (about 5 min) than other multidimensional measures of mindfulness (i.e., the KIMS and the FFMQ). As has been previously argued, the additional scales of the KIMS and FFMQ, although they may be associated conceptually with mindfulness, are not as integral to the construct as are awareness and acceptance, and therefore their inclusion in a scale of mindfulness may be unnecessary.

Implications for a Bidimensional Conceptualization of Mindfulness

Without a scientific understanding of psychological processes, therapeutic techniques will continue to accumulate. As Hayes and Wilson (2003) note, "mindfulness is currently in a somewhat similar situation. The procedure is being specified, and there are data supportive of its impact . . . but its scientific analysis is just beginning. No scientific analysis yet seems adequate to account for the impact of mindfulness" (p. 161). Several new therapies (e.g., Mindfulness-Based Stress Reduction, Mindfulness-Based Cognitive Therapy, Acceptance and Commitment Therapy, DBT) include mindfulness as a central component and link the benefits of these treatments to mindfulness, but how mindfulness may be working to reduce symptoms and increase psychological well-being has not been examined empirically. It is therefore critical to deconstruct the prescientific, global construct of mindfulness to examine empirically its constituents. For this reason, the present series of studies attempted to examine the construct of mindfulness through the lens of science to determine its composition and which of those components are related to psychological functioning.

One important finding was that the two subscales of the PHLMS were not correlated with each other. These results suggest that awareness can be disambiguated from acceptance. This is important because confounding these two components of mindfulness not only begs the question of whether the beneficial effects of increased mindfulness are owing to increased present-moment awareness, increased acceptance, or both, but also the individual effects of acceptance and awareness in theoretical models of psychopathology become obscured. The necessity of a measure that independently assesses these two constituents of mindfulness is important to examine theoretical mechanisms that may be operating in both mindfulness-based and traditional cognitive behavior therapies. For example, in the context of a predisposition toward social anxiety that produces both physiological arousal and negative thoughts related to social evaluation, having higher levels of acceptance may be critical. That is, in the context of a high level of acceptance, the cognitive and physiological arousal may be noticed without attempts to control, escape from, or avoid it, theoretically resulting in minimal impact on behavioral performance (Herbert & Cardaciotto, 2005). On the other hand, acceptance may not play as great a role when levels of awareness are low, and there may be contexts (e.g., when stressors are too difficult to manage or control) in which detaching from one's experience is adaptive (Roger, Jarvis, & Najarian, 1993). However, efforts to sustain low levels of awareness may not always be successful, as unwanted mental phenomena have been shown

to appear in clinical and nonclinical samples (Clark, 2004), and may even backfire, as illustrated by the paradoxical effects of thought suppression. During these times that one cannot help but be aware of distressing experiences, taking a nonjudgmental stance toward those experiences is essential.

Results supported predictions about the differential effects of awareness and acceptance. In the normative nonclinical sample, whereas lower levels of depression and anxiety were found to be related to higher levels of acceptance, awareness was found not to be related to depression and anxiety. In addition, although the nonclinical sample had significantly higher levels of both awareness and acceptance relative to the general psychiatric sample, the magnitude of the difference between the clinical and nonclinical mean acceptance scores was significantly larger than the difference between the samples' mean awareness scores. Although these results are preliminary and in need of replication and extension, they are provocative and warrant further investigation into the distinct roles and protective effects that both awareness and acceptance may play in psychological disorders.

Clinical Implications

Although the PHLMS was developed for use in both applied and research purposes, its use in clinical settings may be premature at this time. However, findings from the present study warrant future research to explore the utility of the PHLMS with psychiatric populations. For example, higher levels of acceptance in clinical patients were found to be related to less rumination, a process associated with psychopathology (e.g., Mor & Winquist, 2002). Similarly, acceptance was a significant predictor of clinical illness severity. If future research not only further validates the PHLMS with clinical populations but also confirms the differential role of acceptance in psychopathology, the measure may be useful clinically. Not only could the PHLMS be used to track patients' progress in mindfulness-based treatments, but also levels of acceptance could be examined to predict treatment outcome or assessed as a psychological vulnerability for pathology.

Limitations

Several limitations of this research should be noted. The inclusion of solely reverse-scored items on the PHLMS Acceptance subscale may be a limitation. Although direct-scored items were generated, they were eliminated after content validity ratings by expert judges, factor analytic procedures, and internal consistency analyses. Similar occurrences were reported by Brown and Ryan (2003) in the development of the MAAS, in which the entire measure

is reverse scored, and by Baer and colleagues (2004) in the development of the KIMS, in which one of four subscales is reverse scored. Brown and Ryan demonstrated that the indirect and direct measurement of their conceptualization of mindfulness were conceptually and psychometrically equivalent, and noted that statements reflecting less mindfulness may be easier for individuals to access and rate. Furthermore, because it was the "Accept Without Judgment" subscale that is reverse scored in the KIMS, Baer and colleagues propose that the lack of a nonjudgmental attitude toward one's private experiences may also be easier to recognize and report.

Although using student participants as normative samples to examine factor structure and to conduct validation studies may be another limitation, research suggests that meaningful variations in mindfulness can be shown in populations without meditation experience (Baer et al., 2004; Brown & Ryan, 2003; Kabat-Zinn, 2003). Furthermore, nonclinical populations can provide evidence for the theoretical model suggesting that awareness and acceptance have differential roles in psychological functioning and are not limited to or byproducts of mental illness.

Finally, the sample sizes of Studies 4 and 5 with clinical patients were relatively small, thereby limiting statistical power and increasing the likelihood of a Type II error. Future research with larger clinical samples is clearly needed.

Directions for Future Research

There are several directions for future research to be considered. As noted above, given that the results from the small clinical sample included in the present project are limited, a high priority for future research should be to conduct further validation analyses with larger clinical samples to examine the potential utility of the PHLMS in clinical populations. In addition, the PHLMS should be validated with individuals who have extensive experience with mindfulness (e.g., regular mindfulness meditators), to provide further evidence that the measure can discriminate between groups expected to differ in degree of mindfulness.

Further validation of the PHLMS could include the examination of its predictive validity by assessing the impact of training in mindfulness or receiving a mindfulness-based therapy on PHLMS scores. These scores could also be compared to changes in mindfulness scores after receiving a nonmindfulness-based psychotherapy. Furthermore, the PHLMS could be used to address the larger question of mechanisms of action not only in mindfulness-based therapies, but in nonmindfulness-based treatments as well. For example, Teasdale et al. (2001) proposed that traditional cognitive therapy may prevent depressive relapse by training patients to change the way

in which depression-related material is processed and the relationship patients have with dysfunctional thoughts, rather than by changing belief in the thought content. This suggests that mindfulness could be a mechanism of action in nonmindfulness-based treatments as well.

CONCLUSION

There has recently been a marked increase in interest surrounding the construct of mindfulness in clinical psychology and related fields, particularly in the development and study of psychological interventions that include mindfulness as a central component. Mindfulness has been described in various ways, as it is "treated sometimes as a technique, sometimes as a more general method or collection of techniques, sometimes as a psychological process that can produce outcomes, and sometimes as an outcome in and of itself" (Hayes & Wilson, 2003, p. 161). Mindfulness is frequently described as a "way of being" (e.g., Kabat-Zinn, 1990; Miller, Fletcher, & Kabat-Zinn, 1995). One way to cultivate this "way of being" is through the formal practice of mindfulness meditation, which emphasizes present-moment detached observation of a constantly changing field of experience. Mindfulness practice involves several metacognitive processes, including the observation of all of one's experiences, maintaining a nonjudgmental stance, and the development of a "watcher self" (Deatherage, 1975). Mindfulness has been described as a type of metacognitive ability during which one has the capacity to observe his or her own experiences from this detached, accepting perspective (Bishop, 2002).

We examined a conceptualization of mindfulness consisting of both awareness and acceptance with the goal of developing a measure that would assess the construct along these two dimensions. Results provide preliminary support for the use of the PHLMS to measure these two components independently, as well as to examine their differential effects in mental illness and psychological health. Since confounding awareness and acceptance in the investigation of mindfulness may obscure their individual effects in the etiology or maintenance of psychopathology, independently assessing these two components may facilitate the scientific investigation of this ancient construct.

REFERENCES

- Aiken, L. R. (1985). Three coefficients for analyzing the reliability and validity of ratings. *Educational and Psychological Measurement*, 45, 131-142.
- Aiken, L. R. (1996). *Rating scales and checklists: Evaluating behavior, personality, and attitudes*. New York: Wiley.

- Anastasi, A., & Urbina, S. (1997). *Psychological testing* (7th ed.). Upper Saddle River, NJ: Prentice Hall.
- Astin, J. A. (1997). Stress reduction through mindfulness meditation. Effects on psychological symptomology, sense of control, and spiritual experience. *Psychotherapy Psychosomatic*, 66, 97-106.
- Ayduk, O., Mischel, W., & Downey, G. (2002). Attentional mechanisms linking rejection to hostile reactivity: The role of "hot" versus "cool" focus. *Psychological Science*, 13, 443-448.
- Baer, R. A., Smith, G. T., & Allen, K. B. (2004). Assessment of mindfulness by self-report: The Kentucky inventory of mindfulness skills. *Assessment*, 11, 191-206.
- Baer, R. A., Smith, G. T., Hopkins, J., Krietemeyer, J., & Toney, L. (2006). Using self-report assessment methods to explore facets of mindfulness. *Assessment*, 13, 27-45.
- Beck, A. T., Epstein, N., Brown, G., & Steer, R. A. (1988). An inventory for measuring clinical anxiety: Psychometric properties. *Journal of Consulting and Clinical Psychology*, 56, 893-897.
- Beck, A. T., & Steer, R. A. (1988). *Manual for the Beck Hopelessness Scale*. San Antonio, TX: Psychological Corporation.
- Beck, A. T., & Steer, R. A. (1993). *Manual for the Beck Anxiety Inventory*. San Antonio, TX: The Psychological Corporation.
- Beck, A. T., Steer, R. A., Ball, R., & Ranieri, W. F. (1996). Comparison of Beck Depression Inventories-IA and II in psychiatric outpatients. *Journal of Personality Assessment*, 67, 588-597.
- Beck, A. T., Steer, R. A., Beck, J. S., & Newman, C. F. (1993). Hopelessness, depression, suicidal ideation, and clinical diagnosis of depression. *Suicide and Life-Threatening Behavior*, 23, 139-145.
- Beck, A. T., Steer, R. A., & Brown, G. K. (1996). *Manual for the revised Beck Depression Inventory*. San Antonio, TX: Psychological Corporation.
- Beck, A. T., Ward, C. H., Mendelson, M., Mock, J., & Erbarugh, J. (1961). An inventory for measuring depression. *Archives of General Psychiatry*, 4, 561-571.
- Bentler, P. M., & Bonett, D. G. (1980). Significance tests and goodness of fit in the analysis of covariance structures. *Psychological Bulletin*, 88, 588-606.
- Bishop, S. R. (2002). What do we really know about mindfulness-based stress reduction? *Psychosomatic Medicine*, 64, 71-83.
- Bishop, S. R., Lau, M., Shapiro, S., Carlson, L., Anderson, N. D., Carmody, J., et al. (2004). Mindfulness: A proposed operational definition. *Clinical Psychology: Science and Practice*, 11, 230-241.
- Bond, F. W., & Bruce, D. (2000). Mediators of change in emotion-focused and problem-focused worksite stress management interventions. *Journal of Occupational Health Psychology*, 5, 156-163.
- Boutelle, K. N., & Kirschenbaum, D. S. (1998). Further support for consistent self-monitoring as a vital component of successful weight control. *Obesity Research*, 6, 219-224.
- Breslin, F. C., Zack, M., & McMain, S. (2002). An information-processing analysis of mindfulness: Implications for relapse prevention in the treatment of substance abuse. *Clinical Psychology Science and Practice*, 9, 275-299.
- Brown, K. W., & Ryan, R. M. (2003). The benefits of being present: Mindfulness and its role in psychological well-being. *Journal of Personality and Social Psychology*, 84, 822-848.
- Brown, K. W., & Ryan, R. M. (2004). Perils and promise in defining and measuring mindfulness: Observations from experience. *Clinical Psychology: Science and Practice*, 11, 242-248.
- Browne, M. W., & Cudeck, R. (1993). Alternative ways of assessing model fit. In K. Bollen & K. Long (Eds.), *Testing structural equation models* (pp. 136-162). Beverly Hills, CA: Sage.
- Buchheld, N., Grossman, P., & Walach, H. (2001). Measuring mindfulness in insight meditation (Vipassana) and meditation-based psychotherapy: The development of the Freiburg Mindfulness Inventory (FMI). *Journal for Meditation and Meditation Research*, 1, 11-34.
- Cioffi, D., & Holloway, J. (1993). Delayed costs of suppressed pain. *Journal of Personality and Social Psychology*, 64, 274-282.
- Clark, D. A. (2004). *Intrusive thoughts in clinical disorders: Theory, research, and treatment*. New York: Guilford.
- Clark, L. A., & Watson, D. (1995). Constructing validity: Basic issues in scale development. *Psychological Assessment*, 7, 309-319.
- Crowne, D. P., & Marlowe, D. (1960). A new scale of social desirability independent of psychopathology. *Journal of Consulting Psychology*, 24, 349-354.
- Crowne, D. P., & Marlowe, D. (1964). *The approval motive*. New York: John Wiley.
- Deatherage, G. (1975). The clinical use of "mindfulness" meditation techniques in short-term psychotherapy. *Journal of Transpersonal Psychology*, 7, 133-143.
- Deikman, A. J. (1996). "I" = awareness. *Journal of Consciousness Studies*, 3, 350-356.
- Dent, H. R., & Salkovskis, P. M. (1986). Clinical measures of depression, anxiety and obsessionality in nonclinical populations. *Behavioral Research and Therapy*, 24, 689-691.
- Dimidjian, S., & Linehan, M. M. (2003). Defining an agenda for future research on the clinical application of mindfulness practice. *Clinical Psychology: Science and Practice*, 10, 166-171.
- Dozois, D. A., Dobson, K. S., & Ahnberg, J. L. (1998). A psychometric evaluation of the Beck Depression Inventory-II. *Psychological Assessment*, 10, 83-89.
- Ehlers, A., & Breuer, P. (1992). Increased cardiac awareness in panic disorder. *Journal of Abnormal Psychology*, 101, 371-382.
- Ehlers, A., & Breuer, P. (1996). How good are patients with panic disorder at perceiving their heartbeats? *Biological Psychology*, 42, 165-182.
- Eifert, G. H., & Heffner, M. (2003). The effects of acceptance versus control contexts on avoidance of panic-related symptoms. *Journal of Behavior Therapy and Experimental Psychiatry*, 34, 293-312.
- Feldman, G. C., Hayes, A. M., Kumar, S. M., & Greeson, J. M. (2003). *Clarifying the construct of mindfulness: Relations with emotional avoidance, over-engagement, and change with mindfulness training*. Paper presented at the Association for the Advancement of Behavior Therapy, Boston, MA.
- Feldman, G. C., Hayes, A. M., Kumar, S. M., Greeson, J. M., & Laurenceau, J. P. (2007). Mindfulness and emotion regulation: The development and initial validation of the cognitive and affective mindfulness scale-revised (CAMS-R). *Journal of Psychopathology and Behavioral Assessment*, 29, 177-190.
- Floyd, F. J., & Widaman, K. F. (1995). Factor analysis in the development and refinement of clinical assessment instruments. *Psychological Assessment*, 3, 286-299.
- Frisch, M. B., Cornell, J., Villanueva, M., & Retzlaff, P. J. (1992). Clinical validation of the Quality of Life Inventory: A measure of life satisfaction for use in treatment planning and outcome assessment. *Psychological Assessment*, 4, 92-101.
- Frydreich, T., Dowdall, D., & Chambless, D. L. (1992). Reliability and validity of the Beck Anxiety Inventory. *Journal of Anxiety Disorders*, 6, 55-61.
- García-Montes, J., Pérez-Álvarez, M., & Fidalgo, Á. (2003). Influence of suppression of self-discrepant thoughts on the vividness of perception of auditory illusions. *Behavioural and Cognitive Psychotherapy*, 31, 33-44.
- Gillis, M. M., Haaga, D. A. F., & Ford, G. T. (1995). Normative values for the Beck Anxiety Inventory, Fear Questionnaire, Penn State Worry Questionnaire, and Social Phobia and Anxiety Inventory. *Psychological Assessment*, 7, 450-455.
- Greenwald, H. J., & O'Connell, S. M. (1970). Comparison of dichotomous and Likert formats. *Psychological Reports*, 27, 481-482.
- Guy, W. (Ed.) (1976). *Clinical global impressions*. New Clinical Drug Evaluation Unit (ECDEU) Assessment Manual for Psychopharmacology. Rockville, MD: NIMH.
- Hair, J. F., Anderson, R. E., Tatham, R. L., & Black W. C. (1998). *Multivariate data analysis* (5th ed.). Englewood Cliffs, NJ: Prentice Hall.

- Harvey, A. G. (2003). The attempted suppression of presleep cognitive activity in insomnia. *Cognitive Therapy and Research*, 27, 593-602.
- Hayes, S. C. (1994). Content, context, and the types of psychological acceptance. In S. C. Hayes, N. S. Jacobsen, V. M. Follette, & M. J. Dougher (Eds.), *Acceptance & change: Content and context in psychotherapy* (pp. 13-32). Reno, NV: Context Press.
- Hayes, S. C., Luoma, J. B., Bond, F. W., Masuda, A., & Lillis, J. (2006). Acceptance and Commitment Therapy: Model, processes, and outcomes. *Behaviour Research and Therapy*, 44, 1-25.
- Hayes, S. C., Strosahl, K., & Wilson, K. G. (1999). *Acceptance and commitment therapy*. New York: Guilford.
- Hayes, S. C., Strosahl, K. D., Wilson, K. G., Bissett, R. T., Pistorello, J., Toarmino, D., et al. (2004). Measuring experiential avoidance: A preliminary test of a working model. *The Psychological Record*, 54, 553-578.
- Hayes, S. C., & Wilson, K. G. (2003). Mindfulness: Method & process. *Clinical Psychology: Science and Practice*, 10, 161-165.
- Hayes, S. C., Wilson, K. G., Gifford, E. V., Follette, V. M., & Strosahl, K. (1996). Experiential avoidance and behavioral disorders: A functional dimensional approach to diagnosis and treatment. *Journal of Consulting and Clinical Psychology*, 64, 1152-1168.
- Herbert, J. D., & Cardaciotto, L. (2005). A mindfulness-based perspective on social anxiety disorder. In S. M. Orsillo & L. Roemer (Eds.), *Acceptance and mindfulness-based approaches to anxiety: Conceptualization and treatment* (pp. 189-212). New York: Springer.
- Ingram, R. E. (1990). Self-focused attention in clinical disorders: Review and a conceptual model. *Psychological Bulletin*, 110, 538-543.
- Kabat-Zinn, J. (1982). An outpatient program in behavioral medicine for chronic pain patients based on the practice of mindfulness meditation: Theoretical considerations and preliminary results. *General Hospital Psychiatry*, 4, 33-47.
- Kabat-Zinn, J. (1990). *Full catastrophe living: Using the wisdom of your body and mind to face stress, pain and illness*. New York: Dell.
- Kabat-Zinn, J. (1994). *Wherever you go, there you are: Mindfulness meditation in everyday life*. New York: Hyperion.
- Kabat-Zinn, J. (2003). Mindfulness-based interventions in context: Past, present, and future. *Clinical Psychology: Science and Practice*, 10, 144-156.
- Karekla, M., Forsyth, J. P., & Kelly, M. M. (2004). Emotional avoidance and panciogenic responding to a biological challenge procedure. *Behavior Therapy*, 35, 725-746.
- Kendall, P. C., Hollon, S. D., Beck, A. T., Hammen, C. L., & Ingram, R. E. (1987). Issues and recommendations regarding the use of the Beck Depression Inventory. *Cognitive Therapy and Research*, 11, 289-299.
- Kline, R. B. (1998). *Principles and practice of structural equation modeling*. New York: Guilford.
- Kosslyn, S. M., & Rosenberg, R. S. (2001). *Psychology: The brain, the person, the world*. Boston: Allyn & Bacon.
- Koster, E. H. W., Rassin, E., Crombez, G., & Naring, G. W. B. (2003). The paradoxical effects of suppressing anxious thoughts during imminent threat. *Behaviour Research and Therapy*, 41, 1113-1120.
- La Du, T. J., & Tanaka, J. S. (1989). Influence of sample size, estimation method, and model specification on goodness-of-fit assessments in structural equation models. *Journal of Applied Psychology*, 74, 625-635.
- Lau, M. A., Bishop, S. R., Segal, Z. V., Buis, T., Anderson, N. D., Carlson, L., et al. (2006). The Toronto Mindfulness Scale: Development and validation. *Journal of Clinical Psychology*, 62, 1445-1467.
- LeBel, J. L., & Dubé, L. (2001, June). *The impact of sensory knowledge and attentional focus on pleasure and on behavioral responses to hedonic stimuli*. Paper presented at the 13th annual American Psychological Society Convention, Toronto, Ontario, Canada.
- Levitt, J. T., Brown, T. A., Orsillo, S. M., & Barlow, D. H. (2004). The effects of acceptance versus suppression of emotion on subjective and psychophysiological response to carbon dioxide challenge in patients with panic disorder. *Behavior Therapy*, 35, 747-766.
- Linehan, M. M. (1993). *Cognitive-behavioral treatment of borderline personality disorder*. New York: Guilford.
- Lyubomirsky, S., & Lepper, H. S. (1999). A measure of subjective happiness: Preliminary reliability and construct validation. *Social Indicators Research*, 46, 137-155.
- Mann, J. J., Waternaux, C., Haas, G. L., & Malone, K. M. (1999). Toward a clinical model of suicidal behavior in psychiatric patients. *American Journal of Psychiatry*, 156, 181-189.
- Marcks, B. A., & Woods, D. W. (2005). A comparison of thought suppression to an acceptance-based technique in the management of personal intrusive thoughts: A controlled evaluation. *Behaviour Research and Therapy*, 43, 433-445.
- McCracken, L. M. (1997). "Attention" to pain in persons with chronic pain: A behavioral approach. *Behavior Therapy*, 28, 271-284.
- McKelvie, S. G. (1978). Graphic rating scales: How many categories? *British Journal of Psychology*, 69, 185-202.
- Miller, J. J., Fletcher, K., & Kabat-Zinn, J. (1995). Three-year follow-up and clinical implications of a mindfulness meditation-based stress reduction intervention in the treatment of anxiety disorders. *General Hospital Psychiatry*, 17, 192-200.
- Miron, D., Duncan, G. H., & Bushnell, M. C. (1989). Effects of attention on the intensity and unpleasantness of thermal pain. *Pain*, 39, 345-352.
- Mor, N., & Winquist, J. (2002). Self-focused attention and negative affect: A meta-analysis. *Psychological Bulletin*, 128, 638-662.
- Muris, P., Merckelbach, H., & Horselenberg, R. (1996). Individual differences in thought suppression. The White Bear Suppression Inventory: Factor structure, reliability, validity, and correlates. *Behaviour Research and Therapy*, 34, 501-513.
- Muthén, L. K., & Muthén, B. O. (1998-2004). *Mplus user's guide*. Los Angeles: Muthén & Muthén.
- Netemeyer, R. G., Bearden, W. O., & Sharma, S. (2003). *Scaling procedures: Issues and applications*. London: Sage.
- Nolen-Hoeksema, S. (1991). Responses to depression and their effects on the duration of depressive episodes. *Journal of Abnormal Psychology*, 100, 569-582.
- Palfai, T. P., Monti, P. M., Colby, S. M., & Rohsenow, D. J. (1997). Effects of suppressing the urge to drink on the accessibility of alcohol outcome expectancies. *Behaviour Research and Therapy*, 35, 59-65.
- Plumb, J. C., Orsillo, S. M., & Luterek, J. A. (2004). A preliminary test of the role of experiential avoidance in post-event functioning. *Journal of Behavior Therapy and Experimental Psychiatry*, 35, 245-57.
- Purdon, C. (1999). Thought suppression and psychopathology. *Behaviour Research and Therapy*, 37, 1029-1054.
- Roelofs, J., Peters, M. L., Patijn, J., Schouten, E. G. W., & Vlaeyen, J. W. S. (2004). Electronic diary assessment of pain-related fear, attention to pain, and pain intensity in chronic low back pain patients. *Pain*, 112, 335-342.
- Roemer, L., & Orsillo, S. M. (2003). Mindfulness: A promising intervention strategy in need of further study. *Clinical Psychology: Science and Practice*, 10, 172-178.
- Roger, D., Jarvis, P., & Najarian, B. (1993). Detachment and coping: The construction and validation of a new scale for measuring coping strategies. *Personality and Individual Differences*, 15, 619-626.
- Segal, Z. V., Williams, J. M. G., & Teasdale, J. D. (2002). *Mindfulness-based cognitive therapy for depression: A new approach to preventing relapse*. New York: Guilford.
- Sullivan, M. J. L., Rouse, D., Bishop, S., & Johnston, S. (1997). Thought suppression, catastrophizing, and pain. *Cognitive Therapy and Research*, 21, 555-568.
- Teasdale, J. D., Scott, J., Moore, R. G., Hayhurst, H., Pope, M., & Paykel, E. S. (2001). How does cognitive therapy prevent relapse in residual depression? Evidence from a controlled trial. *Journal of Consulting and Clinical Psychology*, 69, 347-357.
- Teasdale, J. D., Segal, Z., & Williams, J. M. G. (1995). How does cognitive therapy prevent depressive relapse and why should attention

- control (mindfulness) training help? *Behaviour Research and Therapy*, 33, 25-39.
- Thera, N. (1972). *The power of mindfulness*. San Francisco, CA: Unity Press.
- Trapnell, P. D., & Campbell, J. D. (1999). Private self-consciousness and the five-factor model of personality: Distinguishing rumination from reflection. *Journal of Personality and Social Psychology*, 76, 284-304.
- Wegner, D. M., Schneider, D. J., Carter, S. R., & White, T. L. (1987). Paradoxical effects of thought suppression. *Journal of Personality and Social Psychology*, 53, 5-13.
- Wegner, D. M., & Zanakos, S. (1994). Chronic thought suppression. *Journal of Personality*, 62, 615-640.
- Zaider, T. I., Heimberg, R. G., Fresco, D. M., Schneier, F. R., & Liebowitz, M. R. (2003). Evaluation of the clinical global impression scale among individuals with social anxiety disorder. *Psychological Medicine*, 33, 611-622.