Measuring Hedonic Capacity in Depression: A Psychometric Analysis of Three Anhedonia Scales

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The present study evaluated and compared the psychometric properties of three self-report scales: the Snaith-Hamilton Pleasure Scale (SHAPS; R. P. Snaith, M. Hamilton, S. Morley, & A. Humayan, 1995), Fawcett-Clark Pleasure Capacity Scale (FCPS; J. Fawcett, D. C. Clark, W. A. Scheftner, & R. D. Gibbons, 1983), and the Revised Chapman Physical Anhedonia Scale (CPAS; L. J. Chapman, J. P. Chapman, & M. L. Raulin, 1976). These scales, designed to assess hedonic responsiveness, were administered to 157 college students. Confirmatory factor analysis revealed a Hedonic Capacity factor that was largely defined by the SHAPS but also had a substantial loading from the FCPS. Hedonic Capacity was minimally correlated with constructs of Depression and Anxiety, which were assessed by the Beck Depression Inventory-II and the Beck Anxiety Inventory. The CPAS (anhedonia) was not significantly related to Hedonic Capacity or Anxiety, but it did have a small positive loading on Depression. These findings suggest that further research is needed to clarify the meaning of and relationships among scales that are putative indicators of hedonic capacity and anhedonia. © 2006 Wiley Periodicals, Inc. J Clin Psychol 62: 1545–1558, 2006.

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Anhedonia was first documented by Ribot (1896) as the loss of capacity to experience pleasure. Since this original report, anhedonia has been identified as a symptom of several different syndromes, including schizophrenia (Andreasen, 1982) and stimulant withdrawal (Gawin & Kleber, 1986). In addition, it has been recognized as a core feature of depression (Hasler, Drevets, Manji, & Charney, 2004). Indeed, the diagnosis based on...
the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV; American Psychiatric Association [APA], 1994) requires that either depressed mood or anhedonia be present for a major depression diagnosis. Furthermore, lack of reactivity and anhedonia are key diagnostic criteria for the DSM-IV melancholic subtype of major depression (APA, 1994). Despite the importance of anhedonia to depression, little is known about the assessment of this symptom in the context of depressive psychopathology.

Two major approaches have been utilized to investigate and assess anhedonia (or hedonic capacity) in depression. One approach utilizes laboratory-based measures of anhedonia, involving signal-detection methodology, physiologic measures, and subjective hedonic response to pleasant stimuli (Berenbaum, Snowhite, & Oltmanns, 1987; Berlin, Givry-Steiner, Lecrudier, & Puech, 1998; Ferguson & Katkin, 1996; Fiorito & Simons, 1994; Pizzagalli, Jahn, & O’Shea, 2005). These studies have shown that individuals with higher scores on self-report measures of anhedonia report lower hedonic responses to emotion-eliciting pictures on slides (Ferguson & Katkin, 1996), positive emotional scripts (Fiorito & Simons, 1994), and sucrose solutions (Berlin et al., 1998). High scorers also demonstrate hyporesponsiveness on measures of heart rate and facial expressions in response to emotion-eliciting pictures on slides as compared to those with lower self-reported anhedonia (Ferguson & Katkin, 1996). Additional findings have indicated that depressed participants show higher sweet taste perception thresholds in response to sucrose solutions (Berlin et al., 1998) and show less of a response bias toward stimuli paired with reward (Pizzagalli et al., 2005) than nondepressed participants. Therefore, laboratory measures of hedonic responses to pleasure-eliciting slides appear to be one method of measuring the hedonic capacity construct.

A secondary approach involves the use of questionnaires. Several scales have been designed to assess anhedonia or hedonic capacity specifically (Chapman, Chapman, & Raulin, 1976; Fawcett, Clark, Schefner, & Gibbons, 1983; Kazdin, 1989; Snaith, Hamilton, Morley, & Humayan, 1995; Watson, 1972). The three scales that are most commonly used in depression research are the Snaith-Hamilton Pleasure Scale (SHAPS; Snaith et al., 1995), the Fawcett-Clark Pleasure Capacity Scale (FCPS; Fawcett et al., 1983), and the Revised Chapman Physical Anhedonia Scale (CPAS; Chapman et al., 1976). Although each of these instruments is intended to tap a common construct of hedonic capacity, there are some differences in the content, format, and psychometric characteristics of these scales.

The SHAPS is a 14-item questionnaire instructing participants to agree or disagree with statements of hedonic response in pleasurable situations (e.g., “I would enjoy my favorite television or radio program”). Four responses are possible: Strongly disagree, Disagree, Agree, or Strongly agree. Each item on the SHAPS is worded so that higher scores indicate greater pleasure capacity. A total score can be derived by summing the responses to each item. Higher SHAPS total scores indicate greater pleasure capacity. It covers four domains of hedonic experience: interest/pastimes, social interaction, sensory experience, and food/drink (Snaith et al., 1995). Participants completing the SHAPS are instructed to respond based on their ability to experience pleasure “in the last few days.” This scale has shown adequate overall psychometric properties in clinical and student samples (Gilbert, Allan, Brough, Melley, & Miles, 2002; Snaith et al., 1995). The SHAPS convergent validity has been supported by its correlations with Montgomery Asberg Depression Rating Scale (MADRS; Montgomery & Asberg, 1979) Hedonic Tone item, the Mood and Anxiety Symptom Questionnaire Anhedonic Depression subscale, and Positive and Negative Affect Schedule-Positive Affect subscale (Gilbert et al., 2002; Snaith et al., 1995). Its discriminant validity has been supported by its lack of association with MADRS Depressed Mood and Anxiety items (Snaith et al., 1995).
The FCPS is a 36-item questionnaire asking participants to rate imagined hedonic reactions to hypothetical pleasurable situations (e.g., “You sit watching a beautiful sunset in an isolated, untouched part of the world”). Unlike the SHAPS, which instructs participants to respond based on their pleasure experience in the last few days, participants completing the FCPS are asked to respond based on their current state. Responses are made on a 5-point Likert scale, with left and right anchors of No pleasure at all and Extreme & lasting pleasure. Like the SHAPS, each item on the FCPS is worded so that higher scores indicate greater pleasure capacity. A total score can be derived by summing the responses to each item. Higher FCPS total scores indicate greater pleasure capacity. Items cover several domains of hedonic experience, including social activities, sensory experiences, and sense of mastery of difficult tasks. The psychometric properties of the FCPS have received a considerable degree of attention from depression researchers. This measure has been shown to discriminate depressed and nondepressed participants (Berlin et al., 1998; Loas, Perot, Hardy, & Jouvent, 1994; Loas, Salinas, Pierson, & Guelfi, 1994), distinguish depressed from schizophrenic patients (Berlin et al., 1998), associate with melancholic symptomatology within a depressed sample (Loas & Boyer, 1996), correlate with hedonic responses to sucrose solutions (Berlin et al., 1998), and demonstrate good overall psychometric properties in clinical and nonclinical samples (Clark, Fawcett, Salazar-Grueso, & Fawcett, 1984). One study demonstrated that manifest items from the FCPS tap a single latent dimension, suggesting that loss of pleasure capacity as measured by this scale influenced all itemized experiences (physical and social) in a relatively uniform way (Fawcett et al., 1983).

The CPAS is a 61-item questionnaire asking participants to respond true or false to self-statements about their typical feelings about normally pleasurable stimuli and activities (e.g., “I have usually found love making to be intensely pleasurable”). Like the other two scales, the CPAS measures several domains of pleasure experience, including interest in activities and hobbies, sensory experiences, pastimes, social interaction, and food/drink. The CPAS is different from the FCPS and SHAPS in several ways. First, it uses a true–false response format. Second, it contains some items for which responding true indicates greater pleasure capacity (e.g., “The taste of food has always been important to me”) and other items for which responding true indicates lower pleasure capacity (e.g., “Dancing, or the idea of it, has always seemed dull to me”). Items for which a true response indicates greater pleasure capacity are reversed scored so that higher total scale scores indicate lower pleasure capacity (i.e., greater anhedonia). This contrasts with the other two scales for which all items are positively scored and sum to a total scale score for which greater scores indicate greater pleasure capacity. Third, items on this scale are worded so that they cover hedonic characteristics throughout the lifetime, rather than focusing on recent experience like the other two scales. Fourth, some items assess hedonic reactions to activities (e.g., “The sound of rustling leaves has never much pleased me”), which is congruent with the format SHAPS and FCPS. However, other CPAS items assess interest in activities (e.g., “I have had very little desire to try new kinds of foods”). Psychometrically, there has been some disagreement regarding this scale’s construct validity (Germans & Kring, 2000). This disagreement centers around discrepant findings of studies comparing high and low scorers on the CPAS on emotional responses to affective stimuli. Some studies have shown that low scorers report less positive emotion in response to emotion-eliciting pictures (Ferguson & Katkin, 1996) and imagery of positive emotional scripts (Fiorito & Simons, 1994). However, other studies have found no differences between high and low scorers in reported experience of pleasure in response to pleasant pictures (Berenbaum et al., 1987; Germans & Kring, 2000). In a clinical context, the CPAS has been shown to distinguish melancholic versus nonmelancholic depression.
differentiate depressed versus nondepressed individuals, and correlate with FCPS scores (Berlin et al., 1998; Loas & Boyer, 1996; Loas, Salinas, et al., 1994). At the same time, the CPAS may have poor discriminant validity, evidenced by its association with non-affective forms of psychopathology, such as personality and psychotic disorders (Bailey, West, Widiger, & Freiman, 1993; Katsanis, Iacono, & Beiser, 1990; Schuck, Leventhal, Rothstein, & Irizarry, 1984).

Even though characterizing hedonic capacity in depression depends on adequate measuring tools, there has been little investigation of the psychometric properties of anhedonia scales. Previous studies have evaluated the psychometric properties of these scales individually but not comparatively. In addition, it is unclear how these scales compare to a laboratory-based measure of hedonic capacity. Furthermore, previous studies have been conducted prior to the development of more sophisticated statistically driven psychometric approaches, such as confirmatory factor analysis (CFA; Hoyle, 2000), which can be used to evaluate a measures’ construct validity.

To address these limitations, the current study utilized CFA to examine the degree to which each of these three measures tap the construct of hedonic capacity, defined by questionnaire and laboratory-based measures of anhedonia. In theory, an anhedonia measure is useful in a depression assessment context if it can tap the construct of hedonic capacity without unnecessarily measuring other features that are common in depressed individuals, such as depressed mood and anxiety. Indeed, prior investigations suggest that hedonic experience can be empirically distinguished from dysphoric mood and anxiety (Clark, Steer, & Beck, 1994; Watson, Clark, & Carey, 1988). Therefore, the current investigation examined a CFA model that explained covariance among measures of anhedonia, depression, and anxiety in terms of three latent variables: Hedonic Capacity, Depression, and Anxiety. We then examined the correlations between the three latent variables in order to evaluate whether the Hedonic Capacity latent variable could be adequately distinguished from Depression and Anxiety factors. Finally, we examined the factor loading of each anhedonia scale on the latent Hedonic Capacity factor to interpret each scale’s construct validity. The sizes of loadings were used to estimate the degree to which each scale is a valid indicator of the Hedonic Capacity construct.

**Method**

**Participants**

Adequate variability and normally distributed variables are required for psychometric analyses (otherwise, correlations among variables will be spuriously attenuated). Therefore, we attempted to create a sample with adequate variability in affective pathology by recruiting through two mechanisms. First, we screened 743 university undergraduate students for depression with the Center of Epidemiological Studies Depression Scale (Radloff, 1977). Those scoring above the clinical cutoff (≥16) were included in the study. Those scoring below were selected to participate in a separate investigation focused on nondepressed individuals and were not included in the present study. Second, other unscreened individuals from the general university population were added to create the total sample (N = 157; see Table 1). By recruiting through these mechanisms, the level of depressive severity was allowed to vary both above and below clinical cut-offs. The sample was 70% women and had an average age of 23.1 years (SD = 5.9). The sample was ethnically diverse: 11% were African American, 24% were Asian, 34% were White, 24% were Hispanic, 1% were Native American, and 6% listed their ethnicity as “other.” In return for their participation, subjects received course credit.
Because participation in this study was anonymous, we did not have access to whether subjects in our final sample were sampled from the screening strategy or from the general university population. Therefore, we could not compare the two groups. To better characterize the sample, we compared the current study’s sample to a sample of unscreened individuals of the same university used in a previous study (N/H11005 228). This allowed us to compare and contrast the current sample to an appropriate sample representative of the general undergraduate population. Normality and variability in the scores of the Beck Depression Inventory-Second Edition (BDI-II; Beck & Steer, 1996) were compared by analysis of the Shapiro-Wilk W statistic (Shapiro, Wilk, & Chen, 1968), which estimates the degree to which a sample departs from the normal distribution (higher numbers suggest more normality) and variance estimates. These analyses indicated that the current sample was more normally distributed than the previous study’s sample (W = 0.90 vs. W = 0.86). Variability of BDI-II scores was also greater in the current sample (variance = 96.5 vs. variance = 93.0). Although the mean depressive severity of the current sample was larger than the previous study’s sample (M = 11.5 vs. M = 10.9), this difference was not statistically significant. The demographics of the previous sample were similar to that of the current study: 75% were women and the average age was 23.1 years (SD = 5.7). Seventeen percent were African American, 19% were Asian, 24% were White, 21% were Hispanic, and 7% listed their ethnicity as “other.”

Measures

Questionnaires. Total scores of the FCPS, SHAPS, and CPAS were computed by summing the responses for all items. We chose to use total scores because of prior evidence

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^1Higher scores indicate greater pleasure capacity. ^n = 128.
that manifest items from the FCPS tap a single latent dimension (Fawcett et al., 1983) and previous investigations utilizing the SHAPS and CPAS have used total scores in their analyses (Chapman et al., 1976; Snaith et al., 1995).

In addition to the anhedonia scales, we also included the BDI-II and the Beck Anxiety Inventory (BAI; Beck & Steer, 1993) to measure depression and anxiety, respectively. For the BDI-II, we utilized two subscales relevant to depression typology following the procedures of Pizzagalli et al. (2005) and Joiner, Brown, and Metalsky (2003). An Anhedonic subscale was created by summing responses on BDI-II items associated with anhedonic symptoms (BDI-Anhedonic): loss of pleasure (item #4), loss of interest (item #12), and loss of interest in sex (item #21). A Nonanhedonic subscale consisted of the sum of the remaining items. The BDI-Anhedonic scale has been shown to correlate with melancholic symptomatology (Pizzagalli et al., 2005), associate with low positive affect (Pizzagalli et al., 2005), and distinguish depressed from schizophrenic patients (Joiner et al., 2003). The BDI-Nonanhedonic subscale appears to represent the nonspecific symptoms of depression as it does not distinguish depressed from schizophrenic patients (Joiner et al., 2003). Differentiation of these subscales has been further supported by Joiner et al.’s (2003) findings, which demonstrated that a two-factor CFA model that distinguished anhedonic and nonanhedonic items outperformed a model with one latent variable defined by all 21 items.

For the BAI, we utilized four subscales: (a) Neurophysiological Symptoms (e.g., numbness, dizzy, hands trembling); (b) Subjective Symptoms (e.g., terrified, fear of losing control, scared); (3) Panic Symptoms (e.g., heart pounding, feelings of choking, difficulty breathing); and (d) Autonomic Symptoms (e.g., feeling hot, indigestion, sweating). These subscales were based on the findings of Beck & Steer’s factor and centroid cluster analyses (Beck & Steer, 1993). Recent studies have found further support for these subscales through confirmatory factor analytic techniques, demonstrating that a four-factor solution paralleling the structure of Beck and Steer (1993) fit raw data from all of the 21 BAI items (Osman et al., 2002; Osman, Kopper, Barrios, Osman, & Wade, 1997).

**Picture rating task.** As a laboratory-based measure of anhedonia, participants completed a picture rating task (PRT). Prior studies have demonstrated that procedures involving hedonic responses to pleasant stimuli adequately assess hedonic capacity and associate with relevant self-report measures (Berlin et al., 1998; Germans & Kring, 2000; Willner & Healy, 1994). The PRT in the current study was patterned after the visual stimulus procedure used in Germans and Kring (2000), in which ratings of pleasure in response to pleasant slides were demonstrated to correlate with self-reported reward responsiveness and positive affect. In the current study’s PRT, pictures were loaded by a computer and displayed via an electronic projector producing images approximately 5' x 5' in size. Each exposure was 5 seconds in duration and followed by a 5-second black screen. Participants were instructed to look at pictures for all 5 seconds and then rate how pleasurable each presentation was during the subsequent black screen period. Subjects were reminded to rate each exposure as “if it were a new experience separate from the other presentations.” Paper and pencil ratings were made on an 82-mm visual analog scale (VAS) with not pleasurable at all and extremely pleasurable at left and right anchors, respectively. Thus, the range of possible ratings for each exposure was 0 to 82.

In total, 200 exposures of 10 different pictures comprised the task. All pictures were repeated, although they ranged in the degree of repetition from 5 to 45 presentations (a detailed description of the presentation sequence is available upon request from the corresponding author). Anhedonia and depression did not associate with degree of repetition (i.e., anhedonic or depressed individuals did not habituate to the hedonic properties of
pictures after repeated exposure more quickly than nonanhedonic and nondepressed subjects), $F < 1.48$, all $p > .14$. Therefore, for the current study, a PRT variable was constructed by taking the average rating of all 200 exposures.

As in Germans and Kring (2000), stimuli for the PRT were selected from the International Affective Picture System (IAPS; Lang, Bradley, & Cuthbert, 2001). The IAPS is a set of normative emotional stimuli for experimental investigations of emotion and attention. Each IAPS picture has been rated for valence (i.e., pleasure) and arousal by a large sample of college students with similar characteristics to the current sample. The current task utilized high pleasure and moderate arousal pictures (e.g., kittens, a cat, a dog, fireworks, a baby, a river, the sky, the galaxy, etc.). Because of instrumentation problems, the PRT was administered to only 128 subjects. Comparisons between subjects who completed the PRT ($n = 128$) to those who did not ($n = 29$) indicated no significant differences on any of the mood, anxiety, and anhedonia measures, $F < 2.09, p > .15$.

The mean ($M$) and standard deviation ($SD$) for each measure used in the current study are presented in Table 1. The internal consistency (Cronbach’s $\alpha$) for each measure can be found on the diagonal of the correlation matrix presented in Table 2.

Procedure. Participants were told that the study examined the relation between pleasure experience and mood and were explained the nature of the study procedures before informed consent was obtained. Questionnaires were completed prior to the PRT. All study procedures were approved by the University’s Committee for the Protection of Human Subjects.

Statistical Analyses

Variables that were not normally distributed were logarithmically transformed for hypothesis testing; however, raw $M$s and $SD$s are shown for presentation of descriptive statistics. Univariate statistics were calculated using SAS-Software (SAS Institute Inc., 2003). Covariance structure modeling was used to assess the validity of each anhedonia scale. Two measurement models were tested using the PRT score, SHAPS, CPAS, FCPS, BDI-Anhedonic subscale, BDI-Nonanhedonic subscale, and four BAI subscales as indicators. A single-factor CFA, which represented the manifest data as being explained by a single underlying dimension of emotional disturbance, was compared to a three-factor CFA that distinguished hedonic capacity, depression, and anxiety as separate constructs. All CFAs were modeled using MX-Software (Neale, Boker, Xie, & Maes, 2004). We used several indices of fit obtained from the maximum-likelihood procedure to gauge the extent that models adequately represented the sample data: a relative ratio (RR) $\chi^2/df$ of 5 or less, values near .95 or greater for the comparative fit index (CFI), a Tucker-Lewis (TLI) index value close to or greater than .95, and a root mean square error of approximation (RMSEA) value close to .06 or less (Hu & Bentler, 1999; Osman et al., 2002).

Results

Univariate Correlations

Overall, the pattern of correlations indicates overlap among the anhedonia measures. Of note, correlations of the SHAPS and FCPS with the PRT scores and each other were moderate in size. Associations between these scales and the BDI-Anhedonic subscale were present but to a lower degree. In contrast, the CPAS was not well correlated with the other anhedonia scales or the PRT.
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<td>-.01</td>
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<td>.31*****</td>
<td>.34*****</td>
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<td>.66*****</td>
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<td>.24**</td>
<td>.81*****</td>
<td>.58*****</td>
<td>.72*****</td>
<td>.54*****</td>
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Note. SHAPS = Snaith-Hamilton Pleasure Scale; FCPS = Fawcett Clark Pleasure Scale; CPAS = Chapman Physical Anhedonia Scale; BDI = Beck Depression Inventory-II; BAI = Beck Anxiety Inventory. PRT = Picture Rating Task. Cronbach's alphas are in parentheses on the diagonal.

<sup>a</sup>Higher scores indicate greater pleasure capacity. <sup>b</sup>N = 128.

*p < .10. **p < .05. ***p < .01. ****p < .001. *****p < .0001.
Confirmatory Factor Analyses

All CFAs used the following observed variables: PRT, SHAPS, FCPS, CPAS, BDI-Anhedonic, BDI-Nonanhedonic, BAI-Subjective, BAI-Autonomic, BAI-Neurological, and BAI-Panic. In the single-factor model, all observed variables were regressed on a single latent variable. In the three-factor oblique model, the four measures of anhedonia (i.e., PRT, SHAPS, FCPS, and CPAS) and the BDI-Anhedonic subscale were regressed on a Hedonic Capacity latent factor, the two measures of depression (i.e., the BDI-Anhedonic and Nonanhedonic subscales) were regressed on a Depression latent factor, and the four BAI subscales were regressed on an Anxiety latent factor.

As would be expected, the single-factor model, which ignored construct differentiation among differing dimensions of emotional disturbance, demonstrated relatively poor fit, $\chi^2(35, N = 157) = 268.68$, $RR = 7.7$, CFI = .60, TLI = .49, RMSEA = .21. The three-factor model demonstrated modest fit, $\chi^2(31, N = 157) = 90.64$, $RR = 2.9$, CFI = .85, TLI = .90, RMSEA = .11. To determine what might have been contributing to the lack of fit in the three-factor model, we reexamined the pattern of correlations among the observed variables to detect covariation that may not have been accounted for by the model. Indeed, one of the BAI scales (Subjective) had substantial correlations with the two BDI-II subscales (.42 and .61), suggesting that it may be better served as an indicator of both Depression and Anxiety factors. Although a posteriori, the decision to allow the BAI-Subjective subscale makes sense because previous studies have shown that subjective symptoms of anxiety, such as feeling terrified or scared, and general distress symptoms of depression load onto a common factor (Clark et al., 1994; Watson, Clark, et al., 1988).

Therefore, we ran an alternative model with three oblique factors: Hedonic Capacity (loaded by PRT, SHAPS, FCPS, CPAS, and BDI-Anhedonic), Depression (loaded by BDI-Anhedonic, BDI-Nonanhedonic, BAI-Subjective) and Anxiety (Loaded by BAI-Subjective, BAI-Neurophysiological, BAI-Autonomic, BAI-Panic). This alternative three-factor model demonstrated adequate fit $\chi^2(30, N = 157) = 51.98$, $RR = 1.7$, CFI = .97, TLI = .94, RMSEA = .07. This model was superior in fit compared to the single-factor model, $\chi^2$ difference ($5, N = 157$) = 216.70, $p < .0001$, and to the other three-factor model, $\chi^2$ difference ($1, N = 157$) = 38.68, $p < .0001$. Therefore, we accepted this model as our final model. As illustrated in Figure 1, the Depression and Anxiety factors were moderately correlated ($r = .40$). Hedonic Capacity had a small significant negative factor correlation with Depression ($r = -.20$) and was not significantly correlated with the Anxiety factor ($r = -.14$). Based on the factor correlations, it can be concluded that Hedonic Capacity factor represents a construct that is distinguishable from Anxiety and Depression. As illustrated in Figure 1, all of the factor loadings were significant at $p < .05$ except the path from the Hedonic Capacity factor to the CPAS. Examination of the factor loadings on the Hedonic Capacity factor demonstrated that the best indicator of the construct was the SHAPS, followed by the FCPS, PRT, and the BDI-Anhedonic subscale to a much lesser extent (see Figure 1). To evaluate the possibility that the CPAS could be an indicator of depression or anxiety, further analyses freed the loadings of the CPAS on the Depression and Anxiety factors. The CPAS had a small but significant ($p < .05$) loading on Depression, but the loading on Anxiety was not significant.

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2 We would like to thank the editor for suggesting this model.
Discussion

The aim of this study was to examine the psychometric properties of three scales specifically designed to assess hedonic capacity (i.e., the SHAPS, FCPS, and CPAS) using a CFA approach. Confirmatory factor analysis indicated that the SHAPS and FCPS have substantial communality that can be taken to define a Hedonic Capacity construct but that the CPAS is independent of Hedonic Capacity, as defined by the SHAPS and FCPS.

In concordance with previous investigations in both student and clinical samples (Berlin et al., 1998; Fawcett et al., 1983; Gilbert et al., 2002; Loas & Boyer, 1996; Loas, Perot, et al., 1994; Loas, Salinas, et al., 1994; Snaith et al., 1995), the SHAPS and FCPS demonstrated univariate correlations with depression scales, a laboratory-based measure of anhedonia, and each other. Confirmatory factor analysis indicated that both the SHAPS and FCPS define a Hedonic Capacity construct that is distinguishable from Depression and Anxiety. In these data, Hedonic Capacity was largely defined by the SHAPS, as demonstrated by the factor loading of .92 on the Hedonic Capacity latent variable.

In contrast, CFA and univariate correlations indicated that the CPAS defines a construct that is independent of Depression, Anxiety, and Hedonic Capacity, as defined by the SHAPS and FCPS.

Figure 1. Ten-indicator, three-factor confirmatory factor analysis model. Circles represent latent constructs, and rectangles represent observed variables. An arrow from a circle to an observed variable indicates that the observed variable is explained by a latent construct. The corresponding numbers on these arrows represent standardized factor loadings. The curved arrows on the observed variables represent error variance. The curved arrows on each latent variable to itself represent variance of the latent variables, which was fixed to 1.0 to produce a solution with standardized factor loadings (i.e., a fully standardized solution). The curved arrows linking two latent variables represent the correlation between those factors. PRT = Picture Rating Task; SHAPS = Snaith-Hamilton Pleasure Scale; FCPS = Fawcett-Clark Pleasure Scale; CPAS = Chapman Physical Anhedonia Scale; BDI = Beck Depression Inventory-II; An = Anhedonic; NA = Nonanhedonic; BAI = Beck Anxiety Inventory, S = Subjective, N = Neurophysiological, A = Autonomic, P = Panic. *p < .05
with Hedonic Capacity, but it did not. Thus, the construct validity of the CPAS, as a measure of Hedonic Capacity, was not supported.

These findings are consistent with previous examinations of nonclinical samples that demonstrated that the CPAS is not associated with depressive severity, melancholic symptom severity, the BDI-Anhedonic scale, positive affect, a signal-detection method of anhedonia assessment, and hedonic responses to pleasant visual and tactile stimuli (Germans & Kring, 2000; Pizzagalli et al., 2005). However, in clinical samples, the CPAS has been shown to distinguish melancholic versus nonmelancholic depression, differentiate depressed versus nondepressed individuals, and correlate with FCPS scores and subjective responses to sucrose solutions (Berlin et al., 1998; Loas & Boyer, 1996; Loas, Salinas, et al., 1994). At the same time, studies have failed to demonstrate the clinical specificity of the CPAS for depressive states, as there is considerable overlap in CPAS scores with psychotic disorders and personality disturbance (Bailey et al., 1993; Katsanis et al., 1990; Schuck et al., 1984).

Why is the CPAS unrelated to the FCPS and SHAPS, and what does this finding mean in the context of the anhedonia literature? Snaith et al. (1995) argued that there are problems with the CPAS because of its extended length and cultural bias. For example, the CPAS includes items such as “Poets always exaggerate the beauties of nature” and “I have always found organ music dull and unexciting.” Many individuals may find organ music unexciting, regardless of their depressive or anhedonic status, which could reduce the construct validity of this scale.³ In contrast, the SHAPS and FCPS contain items with a wider range of applicability (SHAPS: “I would be able to enjoy my favorite meal”; FCPS: “You reach full sexual climax with someone you love very much”). The SHAPS was specifically constructed to be unaffected by social class, gender, age, dietary habits, and nationality (Snaith et al., 1995). This is evident in the general content of SHAPS items (e.g., “I would get pleasure from helping others”; “I would enjoy my favorite television or radio program”). On the other hand, although the FCPS items appear to apply to a greater range of individuals than the CPAS, it does contain some culturally biased items (e.g., “Your neighbors rave about the way you keep up your house and yard” is not relevant for some individuals). Thus, in addition to the statistical salience of the SHAPS in this research, the SHAPS seems to have items that are more generally relevant.

Another explanation of the contrast in psychometric properties between the CPAS and the other scales involves the temporal domain that each scale covers. The FCPS and SHAPS are both state-level scales assessing hedonic capacity “right now” (FCPS) or based on “experience in the ‘last few days’” (SHAPS). State-level scales might be especially relevant to depressive states. The CPAS, however, assesses at the trait level and asks about personal beliefs over the lifespan. Indeed, results from the univariate analyses and CFAs indicated that the state-level scales (i.e., SHAPS, FCPS, PRT, BDI-II) tended to correlate with each other, whereas the CPAS did not strongly associate with any of the other scales. However, it is unlikely that temporal factors solely account for psychometric differences between the CPAS and the other two scales. If this were the case, one would expect the SHAPS and FCPS to show markedly stronger relationships than the CPAS to unrelated state-level measures, such as the BAI. However, the correlation between the SHAPS and the BAI-Total score (r = .14) was not significantly different than the asso-

³To empirically evaluate the hypothesis that the CPAS demonstrated poor psychometric properties because of its cultural bias, we examined whether the CPAS associated with age, ethnicity, or gender. These analyses indicated that relations between the CPAS and these demographic variables were all nonsignificant, F’s < 1.01, ps > .42. However, these demographic characteristics may not adequately cover sources of cultural bias potentially present in the CPAS.
The correlation between the FCPS and the BAI-Total score \( (r = .14) \) was also not significantly different than the association between the CPAS and BAI-Total score \( (r = .05), t(154) = .62, p = .53 \).

In addition to differences in the temporal domain of assessment, the item content of the CPAS differs from both the FCPS and SHAPS. The wording of SHAPS and FCPS are limited to hypothetical pleasurable situations (e.g., “I would enjoy my favorite television or radio program”). In contrast, the wording of some of the CPAS items appears to describe pessimistic and cynical beliefs and a lack of interest in certain experiences (e.g., “I don’t know why some people are so interested in music”; “I don’t understand why people enjoy looking at the stars at night”), which are not clearly hedonic or pleasure seeking. Although as indicated the content of the CPAS may be associated with clinical depression and other forms of psychopathology, including personality disturbance and psychotic disorders (Bailey et al., 1993; Katsanis et al., 1990; Schuck et al., 1984), it may not be primarily an indicator of hedonic capacity or anhedonia.

The limitations of this study should be acknowledged. One important limitation was that all measures were self-report and that the sampling of measures was quite restricted. A few self-report instruments narrowly defined the constructs, and those constructs were not evaluated in relation to constructs obtained by other methods. Evaluating multiple measures employing different methods (e.g., self-report vs. clinician rating vs. physiological indices) would define more general concepts that are independent of method and would permit evaluation of the validity and meaning of the self-report constructs in relation to similar constructs inferred from other measurement methods. Another limitation was that although a portion of the current sample was selected to have elevated levels of self-reported depression, the results cannot be assumed to generalize to an actual clinical sample.

Accordingly, future studies are indicated to evaluate the reliability, validity, and utility of anhedonia scales in clinically depressed patients. More highly specified comparisons of self-report, clinician-rated, and laboratory-based measures of anhedonia in various diagnostic groups might be useful. An initial study has already demonstrated that the BDI-Anhedonic subscale can distinguish between depressed and schizophrenic patients (Joiner et al., 2003). Extending these findings to other measures of anhedonia and examining their specificity to specific diagnostic groups (mood vs. anxiety and psychotic disorders; melancholic vs. nonmelancholic major depression; unipolar vs. bipolar depression) may contribute to a more accurate characterization of relevant individual differences in depressive pathology. Nevertheless, the current study provides initial evidence that two anhedonia scales, the SHAPS and FCPS, could be useful tools for assessing hedonic capacity in depressed college students.

References


