

Development and Psychometric Evaluation of the Yale–Brown Obsessive-Compulsive Scale—Second Edition

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The Yale–Brown Obsessive-Compulsive Scale (Y-BOCS; Goodman, Price, Rasmussen, Mazure, Delgado, et al., 1989) is acknowledged as the gold standard measure of obsessive-compulsive disorder (OCD) symptom severity. A number of areas where the Y-BOCS may benefit from revision have emerged in past psychometric studies of the Severity Scale and Symptom Checklist. Therefore, we created the Yale–Brown Obsessive-Compulsive Scale—Second Edition (Y-BOCS–II) by revising the Severity Scale item content and scoring framework, integrating avoidance into the scoring of Severity Scale items, and modifying the Symptom Checklist content and format. One hundred thirty treatment-seeking adults with OCD completed a battery of measures assessing OCD symptom severity and typology and depressive and anxious symptomology. Interrater and test–retest reliability were assessed on a subsample of participants. The Y-BOCS–II showed strong internal consistency for the Symptom Checklist (Kuder–Richardson-20 = .91) and Severity Scale (α = .89). Test–retest and interrater reliabilities were both high (intraclass correlations > .85). Confirmatory factor analyses did not show adequate fit with previous models of the Y-BOCS. Exploratory factor analysis revealed a two-factor solution generally consistent with the Obsession and Compulsion Severity subscales. Construct validity was supported by strong correlations with clinician-rated measures of OCD symptom severity and moderate correlations with measures of worry and depressive symptoms. Taken together, the Y-BOCS–II has excellent psychometric properties in assessing the presence and severity of obsessive-compulsive symptoms. Although the Y-BOCS remains a reliable and valid measure, the Y-BOCS–II may provide an alternative method of assessing symptom presence and severity.

Keywords: Yale–Brown Obsessive-Compulsive Scale, obsessive-compulsive disorder, validity, assessment, treatment

Obsessive-compulsive disorder (OCD) is an anxiety disorder characterized by recurrent or persistent thoughts, impulses, or images that are experienced as intrusive or distressing (obsessions) and/or repetitive behaviors or mental acts (compulsions) often performed to reduce obsessional distress. Point-prevalence rates of OCD are estimated to be between 1–2% (Crino, Slade, & Andrews, 2005; Karno, Golding, Sorenson, & Burnam, 1988; Weissman et al., 1994), with the majority of adults having an onset during childhood (Millet et al., 2004). In the absence of treatment, OCD runs a chronic, unremitting

course (Pinto, Mancebo, Eisen, Pagano, & Rasmussen, 2006) with impairments in a number of domains (Eisen et al., 2006; Huppert, Simpson, Nissenson, Liebowitz, & Foa, 2009).

The Yale–Brown Obsessive-Compulsive Scale (Y-BOCS; Goodman, Price, Rasmussen, Mazure, Delgado, et al., 1989; Goodman, Price, Rasmussen, Mazure, Fleischmann, et al., 1989) is a widely used clinician-administered measure that assesses the presence and severity of obsessive-compulsive symptoms over the past week. The Y-BOCS includes two primary sections: the Severity Scale and the Symptom Checklist.¹ On the Symptom Checklist, 54 obsessions and compulsions are rated in a dichotomous

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¹ In addition to the Y-BOCS Severity Scale and Symptom Checklist, there is a targeted symptom list and a number of supplemental items that assess symptoms or behaviors that often appear with but are not subsumed under the definition of OCD and are not included in the Y-BOCS scoring. The targeted symptom list, which is included in the Y-BOCS–II, involves listing the patient's three most impairing or distressing obsessions, compulsions, and avoidance behaviors. The supplemental items comprise insight, avoidance, indecisiveness, sense of responsibility, pervasive slowness, and pathological doubt. These items were not included in the Y-BOCS–II.

fashion for their current (i.e., with the past week) and past presence (i.e., occurred in the past but no longer an issue). The Severity Scale contains 10 items that assess the following features of endorsed obsessions and compulsions: distress related to obsessions or not performing compulsions, time occupied by obsessive thoughts or compulsions, functional interference due to obsessions or compulsions, efforts to resist obsessions or compulsions, and degree of control over obsessions or compulsions. Each item is rated on a 5-point Likert-type scale (lower scores correspond with better health) that incorporates patient report, others' accounts, and the clinician's observations and judgment. Trained clinicians administer each item but have the latitude to query further to determine the most accurate answer. As well, clinical observations (e.g., a patient is ritualizing during the interview) and clinician judgment are incorporated into determining the final rating as appropriate. For example, if the clinician believes that a patient is over- or underreporting symptoms, the final rating may be adjusted accordingly. Separate Obsession Severity and Compulsion Severity subscale scores are derived (range = 0–20), as well as a Total Severity Scale, which is the sum of all items (range = 0–40).

Despite its wide use and acceptance as the gold standard for OCD symptom severity assessment,² there are areas where the Y-BOCS may benefit from revision. Issues include concerns about the conceptual fit of the “resistance to obsessions” item, sensitivity to symptom detection and change in severe cases, lack of integration of avoidance into the scoring of items, and the need to update the Symptom Checklist. Given these issues, we have revised the Y-BOCS; we refer to this new version of the scale as the Y-BOCS-II (Goodman, Rasmussen, Price, & Storch, 2006). A description of each revision and the accompanying rationale follow.

Eliminating the “Resistance to Obsessions” Item

The “resistance to obsessions” item was eliminated because it was not a manifestation of psychological health, as was its original intention. In the Y-BOCS, it was hypothesized that increased resistance to obsessions would be associated with reduced impairment and greater psychiatric health. Although this principle holds for resisting compulsions, it is typically not the case with obsessions, in which efforts to resist obsessions are often maladaptive and associated with greater impairment (Purdon & Clark, 2000; Rassin, Muris, Schmidt, & Merckelbach, 2000). Indeed, patients in exposure and response prevention therapy, a form of psychotherapy with proven efficacy in OCD treatment (e.g., Abramowitz, Foa & Franklin, 2003; Foa et al., 2005), are encouraged to counteract their obsessive symptoms by not struggling against them (e.g., “just let the thoughts come”) or by intentionally bringing on the disturbing thoughts. In addition to the conceptual rationale, the “resistance against obsessions” item had the lowest correlation with the Y-BOCS Severity Scale (Woody, Steketee, & Chambless, 1995) and loaded weakly on the Obsession Severity subscale in factor analytic studies (e.g., McKay, Danyko, Neziroglu, & Yaryura-Tobias, 1995). Although the Y-BOCS scoring format has been based on the presumption of an underlying two-factor structure consisting of Obsessions and Compulsions, with a higher order factor consisting of Overall Symptom Severity, factor analytic studies of the Severity Scale have yielded inconsistent results with some in support of this structure (Amir, Foa, & Coles, 1997;

Arrindell, de Vlamming, Eisenhardt, van Berkum, & Kwee, 2002; McKay et al., 1995; McKay, Neziroglu, Stevens, & Yaryura-Tobias, 1998), whereas others have suggested a two-factor structure comprising Interference (i.e., distress related to obsessions or not performing compulsions, time occupied by obsessive thoughts or compulsions, functional interference due to obsessions or compulsions) and Resistance/Control (efforts to resist obsessions or compulsions, degree of control over obsessions or compulsions; Amir, Foa, & Coles, 2000; Deacon & Abramowitz, 2005; Storch et al., 2005). Given the weak correlation of the “resistance to obsessions” item to the Y-BOCS Severity Scale (Woody et al., 1995) and weak factor loadings of this item, there was the possibility that replacing the “resistance to obsessions” item with “obsession-free interval” may contribute to the hypothesized Y-BOCS-II factor structure (i.e., separate Obsession and Compulsion Severity subscales) that corresponds to the cognitive-behavioral model of OCD (i.e., that obsessional anxiety motivates compulsions).

To preserve an equal number of items for purposes of comparing severity of obsessions versus compulsions, as well as to improve sensitivity to change in severe presentations, we replaced this item. In the Y-BOCS, items examining obsession- and compulsion-free intervals were included but not incorporated into the scale scores. These items assessed the duration of waking hours per day, on average, that the person was completely free of obsessions or compulsions. However, we found that the obsession-free interval item allowed for improved assessment of the time burden imposed by obsessions and therefore have included it in the Y-BOCS-II. Empirical evidence for this includes moderate correlations between this item and functional impairment (Reid, Storch, & Murphy, 2009).

Sensitivity to Change

Although numerous studies have demonstrated the treatment sensitivity of the Y-BOCS (e.g., Foa et al., 2005; Simpson et al., 2008), our clinical experience involving the most extreme cases of OCD suggests that the Y-BOCS is not sensitive enough to measure small but clinically meaningful differences in symptom severity at high levels of symptom severity. As well, we have come to believe that there is a qualitative difference in the illness presentation of those whose waking hours are dominated by obsessive-compulsive symptoms versus those who experience some respite, even if relatively brief in duration. In some of these extremely ill patients, modest improvement in response to treatment interventions were observed but not detected by the Y-BOCS. For example, the Y-BOCS would not be able to detect if a patient's time spent on

² A number of lines of evidence suggest that the Y-BOCS is considered the gold standard in OCD symptom severity assessment, which is operationally defined as a commonly used assessment instrument that serves as the primary basis for evaluating obsessive-compulsive symptom severity both within and between patients. Such data include (a) the overwhelming majority of treatment studies using the Y-BOCS as the primary outcome measure (e.g., Simpson et al., 2008), (b) recognition within the assessment literature of its wide use and excellent psychometric properties (e.g., Taylor, 1998; Taylor, Thordarson, & Sochting, 2004), and (c) a considerable literature on symptom dimensionality that has emerged from the Y-BOCS literature (e.g., Bloch, Landeros-Weisenberger, Rosario, Pittenger, & Leckman, 2008; Mataix-Cols et al., 2005).

obsessions decreased from 16 hours to 8 hours a day, a 50% reduction. To deal with this limitation, we expanded the upper ends of the Severity Scale items so that there are now six response categories to choose from instead of five (range = 0–50). In essence, the highest severity rating from the Y-BOCS was split in two with minimal alterations in anchors for the other four choices at lower severity levels. Although most patients should continue to fall within the 0–40 range included in the Y-BOCS, this revision will enable more accurate symptom assessment for the most severe patients.

Avoidance

There was a lack of clarity on how to rate ritualistic avoidance in the Y-BOCS. Yet, avoidance behaviors are a common part of the clinical presentation of OCD (Abramowitz, Lackey, & Wheaton, 2009; Alonso et al., 2008; Pinto, Mancebo, Eisen, Pagano, & Rasmussen, 2006), and the severity of symptoms can be underestimated because avoidance is being practiced instead of compulsions. For example, a person with severe contamination fears may not leave his or her home to minimize contact with “contaminated” stimuli and, by proxy, the frequency and intensity of obsessive-compulsive symptoms. However, this person would likely be significantly impaired even though he or she is not engaging in overt compulsions. Like compulsions, active avoidance behaviors are undertaken to neutralize or reduce anxiety (Clark, 1999; Salkovskis, 1991) and are often used in lieu of or to prevent triggering more protracted compulsions. Estimates suggest that avoidance behaviors are quite common, with recent findings indicating that, on average, adults with OCD were rated on a supplemental Y-BOCS item that assesses the degree of avoidance as exhibiting levels of avoidance consistent with “moderate, some avoidance clearly present.” As well, adults with OCD experience high rates of avoidant personality disorder (~15%) and other comorbid psychiatric disorders (e.g., agoraphobia) that likely reflect high rates of avoidant behavior (Pinto et al., 2006).

It is, therefore, important to capture active avoidance, as this may contribute to an underestimation of symptom severity or the underdetection of symptoms. Given this, the Y-BOCS-II considers active avoidance behaviors to be compulsions, in that they involve behaviors like compulsions or replace compulsions (generalized avoidance is not rated as avoidance). As a reflection of the increased importance placed on avoidance behavior, probes and anchor points have been added to two of the compulsion items: “distress if compulsions (or avoidance) prevented” and “interference from compulsions.” In addition, the instructions to the obsession interference item have been revised to emphasize the impact of avoidance on functioning.

Symptom Checklist

Since the publication of the Y-BOCS, it has become clear that not all obsessive-compulsive symptoms are fear based. In some cases, patients report a feeling of discomfort or a need to complete tasks until they feel “just right” (Coles, Heimberg, Frost, & Steketee, 2005; Pietrefesa & Coles, 2008). Accordingly, the Symptom Checklist has been modified to allow for empirical research aimed at understanding the clinical significance of these distinctions. More specifically, relevant items have been reworded or divided

into two or more parts (e.g., certain obsessions are now listed with or without feared consequences).

On the basis of our clinical experiences and informal clinician feedback, several other revisions were made to the Symptom Checklist, including (a) the addition of explanations and examples to enhance the reliability of symptom determination, particularly with regard to clarifying difficult differential diagnostic points, and (b) a priori symptom headings such as contamination and aggression have been removed, as such headings might have reduced some flexibility in conceptualization of the symptoms by confining them to preassigned classifications.

In sum, the Y-BOCS-II is different from the Y-BOCS in several ways: (a) “resistance to obsessions” (Item 4) has been replaced by “obsession-free interval”; (b) the scoring of all items has been expanded from 5-point (0–4) to 6-point (0–5) Likert-type response scales, so that the upper limit on the total Y-BOCS-II (sum of Items 1–10) is now equal to 50 instead of 40; (c) assessment of avoidance behaviors has been given added emphasis, as reflected in the instructions and anchor points for most items; and (d) modifications have been made in the content and format of the Symptom Checklist. Given these revisions to the Y-BOCS-II, an evaluation of its reliability and validity is warranted. We had six research questions:

1. What is the internal consistency of the Y-BOCS-II items?
2. What is the short-term stability of the Y-BOCS-II?
3. What is the interrater reliability of the Y-BOCS-II?
4. Does the Y-BOCS-II factor structure yield separate Obsessions and Compulsions factors as assumed by the scoring structure?
5. Does the Y-BOCS-II correlate with other measures of OCD symptoms?
6. Is this relationship stronger than correlations with measures of worry and depression?

Method

Participants

A total of 130 individuals with OCD (49% women) who presented to one of two specialty OCD clinics for treatment were included in the study. Participants had a principal diagnosis of OCD according to the criteria defined in the *Diagnostic and Statistical Manual of Mental Disorders* (4th ed.; *DSM-IV*; American Psychiatric Association, 2000) made by a licensed psychologist with experience in assessing and diagnosing OCD. Diagnoses were confirmed by a second clinical psychologist on the basis of a discussion of the patient’s clinical presentation and review of records. The Anxiety Disorder Interview Schedule for the *DSM-IV* (Brown, DiNardo, & Barlow, 1994) was also administered by a trained research assistant to individuals continuing with treatment; diagnoses of OCD were confirmed in 100% of cases. Patients were excluded if they presented with any of the following diagnoses: schizophrenia, mental retardation, pervasive developmental disorder

ders, or neurological disorders. Patients with comorbid Axis I disorders were not excluded if their primary diagnosis was OCD. See Table 1 for demographic characteristics of the study sample.

Measures

Obsessive–Compulsive Inventory—Revised (OCI–R; Foa et al., 2002). The OCI–R is an 18-item self-report measure that assesses the presence and distress associated with obsessive-compulsive symptoms. Participants rate the degree to which they are bothered by their obsessive-compulsive symptoms on a 5-point Likert-type scale, from 0 (*not at all disturbed*) to 4 (*extremely disturbed*). The OCI–R correlates highly with the OCI ($r = .98$) and assesses the following symptom dimensions: washing, checking, ordering, obsessing, hoarding, and mental neutralizing. The OCI–R has good psychometric properties, including high internal consistency both in individuals with OCD ($\alpha = .83$) and in individuals with other anxiety disorders ($\alpha = .88$; Abramowitz & Deacon, 2006) and high 2-week test–retest reliability ($rs = .74-.91$; Foa et al., 2002). The OCI–R also shows good construct validity (Grabill et al., 2008; Huppert et al., 2007), correlating well with the Y-BOCS ($r = .53$) and the Maudsley Obsessive-Compulsive Inventory (Hodgson & Rachman, 1977; $r = .85$).

Clinical Global Impression—Severity (CGI–S; National Institute of Mental Health, 1976). The CGI–S is a widely used 7-point clinician rating of severity of psychopathology. Severity ratings can range from 0 (*no illness*) to 6 (*extremely severe*). The CGI–S is treatment sensitive and frequently used in both psychological and psychiatric treatment trials (Hollander et al., 2003).

National Institute of Mental Health Global Obsessive-Compulsive Scale (NIMH-GOCS; Murphy, Pickar, & Alterman, 1982). The NIMH-GOCS is a one-item clinician-rated measure of OCD symptom severity and global functioning. Ratings are made on a Likert-type scale ranging from 1 (*minimal symptoms*) to 15 (*very severe*). The NIMH-GOCS has high test–retest reliability over a 2-week period ($rs = .87-.98$; Kim, Dysken, & Kuskowski,

1990), good interrater reliability ($rs = .77-.95$), and high correlations with the original Y-BOCS ($r = .68$; see Grabill et al., 2008).

Penn State Worry Questionnaire (PSWQ; Meyer, Miller, Metzger, & Borkovec, 1990). The PSWQ is a 16-item questionnaire with Likert-type ratings indicating degree of agreement with statements related to worrying. Response choices are anchored on a 1 (*not at all typical of me*) to 5 (*very typical of me*) scale, with higher scores corresponding with greater worry. Strong psychometric properties have been reported, including high internal consistency ($\alpha = .94$), adequate test–retest reliability ($r = .74$), and excellent treatment sensitivity (Covin, Ouimet, Seeds, & Dozois, 2008; Meyer et al., 1990; Molina & Borkovec, 1994). Previous research indicates the PSWQ can adequately distinguish worry from obsessions (e.g., Burns, Keortge, Formea, & Sternberger, 1996).

Inventory of Depressive Symptomatology—Self Report (IDS–SR; Rush et al., 1986; Rush, Gullion, Basco, Jarrett, & Trivedi, 1996). The IDS–SR is a 30-item self-report measure of *DSM–IV* depressive symptoms, including depressed mood, anhedonia, fatigue, and poor concentration. The IDS–SR is frequently used as a tool to assess the severity of depression in large multicenter studies (e.g., Fava et al., 2003). The IDS–SR has demonstrated good internal consistency ($\alpha = .76-.94$); strong correlations with other measures of depression, including the Quick Inventory of Depressive Symptomatology (Rush et al., 2003) and the Hamilton Rating Scale for Depression (Hamilton, 1960; Rush et al., 1996; Trivedi et al., 2004); and is a treatment-sensitive measure of symptom severity in depression (Jenkins, Carmody, & Rush, 1998; Rush et al., 1996; Surís, Kashner, Gillaspay, Biggs, & Rush, 2001). No studies to date have determined whether the IDS–SR distinguishes depression symptoms from obsessions.

Procedure

All participants provided written informed consent as approved by the respective institutional review board at each institution. All participants completed an initial assessment that included a semi-structured interview with an experienced psychologist and administration of the Y-BOCS–II by a trained masters- or doctoral-level clinician. The same clinician rated symptom severity on the CGI–S, while the interviewing psychologist rated OCD severity on the NIMH-GOCS. Training of raters, who were all experienced in using the Y-BOCS prior to study onset, included attendance at an instructional meeting, observing at least five clinical administrations of the measure, and administering the Y-BOCS–II three times under direct observation. Administration of the Y-BOCS–II was observed and independently rated by a second observer for 68 participants (52.3%) to examine interrater reliability. This rater was allowed to ask additional questions during the assessment. After administration of the clinician-rated measures, instructions were given to participants on completing the self-report questionnaires. To examine test–retest reliability, we had the Y-BOCS–II readministered to 92 participants (70.8%) approximately one week after their initial evaluation by the same clinician but before their first treatment session. No external incentives were offered for participating in this study.

Table 1
Demographic Characteristics of the Study Sample

Variable	Value
Gender	66 men, 64 women
Age (years)	$M = 31.76$, $SD = 12.70$, range = 18–68
Race or ethnicity	
Caucasian	85.9%
Hispanic American	8.6%
African American	2.3%
Self-identified as “other”	3.1%
Taking psychotropic medication	$n = 85$ (65%)
Comorbid psychiatric condition ^a	$n = 106$ (81%)
Depression	$n = 76$ (58.5%)
Generalized anxiety disorder	$n = 31$ (23.9%)
Social phobia	$n = 10$ (7.7%)

^a Depression, generalized anxiety disorder, and social phobia were the three most common comorbidities reported. Other comorbid conditions that occurred with less frequency are not noted.

Data Analysis

Descriptive statistics were initially calculated to examine the prevalence and severity of OCD symptoms, pathological worry, and depressive symptoms in our sample. Independent samples *t* tests were used to examine potential differences between sexes, whereas zero-order correlations were used to explore the relationships between psychometric measures and age. Internal consistency reliability for the Y-BOCS-II Symptom Checklist was calculated using the Kuder-Richardson-20 formula. Cronbach's alpha (Cronbach, 1951) was used to examine the internal consistency of the Y-BOCS-II Severity Scale and the Obsession and Compulsion Severity subscales. Estimates above .70 are considered to reflect adequate reliability (Nunnally & Bernstein, 1994). Interrater reliability and test-retest reliability were tested using mixed models to calculate the intraclass correlation coefficient (ICC). Intraclass correlations above .60 demonstrate adequate reliability (Landis & Koch, 1977). Zero-order correlations were computed to determine the convergent and discriminant validity of the Y-BOCS-II. All statistical analyses were two-tailed, with the alpha level set at .05.

The factor structure of the Y-BOCS-II was initially examined using confirmatory factor analysis to examine two different two-factor solutions. The first corresponded with the hypothesized Obsessions and Compulsions factors and the second corresponded with Interference/Severity and Resistance/Control factors (Amir, Foa, & Coles, 2000; Deacon & Abramowitz, 2005; Storch et al., 2005). Model fit for the confirmatory factor analyses was evaluated with multiple fit indices, including chi-square, the goodness-of-fit index (Jöreskog & Sörbom, 2003), the normed fit index (Bentler & Bonnett, 1980), the comparative fit index (Bentler, 1990), the root mean square residual (RMR; Jöreskog & Sörbom, 1997), and the root mean square error of approximation (RMSEA; Steiger, 1990). Values of the goodness-of-fit index, normed fit index, and comparative fit index above .90 were considered to indicate an adequate fit, whereas RMSEA less than .06 and standardized RMR less than .08 were considered an adequate fit (Byrne, 2001; Hu & Bentler, 1999). Subsequent exploratory factor analysis was conducted using principal-axis factoring with a promax rotation. Principal-axis factoring was used to extract only those factors with shared item variance (Hair, Anderson, Tatham, & Black, 1998), whereas the promax rotation was chosen as an oblique method of rotation to allow for a relationship between factors. We selected factors on the basis of eigenvalues (greater than 1.00), examination of the scree plot deflection, and interpretability. We considered items with a pattern matrix value greater than or equal to .40 as loading on a factor.

Results

Questionnaire results are presented in Table 2. Individual Y-BOCS-II item scores and endorsement frequencies are shown in Table 3. There were no significant differences between sexes for any of the clinician-administered or self-report measures (*t*s < 1.2, *p*s > .23). Older age was significantly associated with increased symptom severity as measured by the Y-BOCS-II Severity Scale score, *r* = .22, *p* < .01; the CGI-S, *r* = .20, *p* < .02; and the NIMH-GOCS, *r* = .21, *p* < .02. There was no relationship between age and OCI-R total score, *r* = -.10, *p* = .27; PSWQ score, *r* = -.04, *p* > .65; or IDS-SR score, *r* = .01, *p* > .97.

Table 2
Self-Report Questionnaire Results

Measure	<i>M</i>	<i>SD</i>	Range
Y-BOCS-II Severity Scale	30.55	7.44	9–48
Y-BOCS-II Obsessions	15.58	4.02	6–24
Y-BOCS-II Compulsions	14.96	4.20	1–25
Original Y-BOCS Severity Scale	29.03	6.78	9–40
CGI-S	4.05	1.04	1–6
NIMH-GOCS	9.42	2.18	3–14
OCI-R (<i>n</i> = 119)	29.32	13.47	2–80
PSWQ (<i>n</i> = 121)	58.75	11.15	27–75
IDS-SR (<i>n</i> = 120)	31.70	13.59	4–70

Note. *N* = 130 unless otherwise specified. Y-BOCS-II = Yale-Brown Obsessive-Compulsive Scale—Second Edition; CGI-S = Clinical Global Impression—Severity; NIMH-GOCS = National Institute of Mental Health Global Obsessive Compulsive Scale; OCI-R = Obsessive Compulsive Inventory—Revised; PSWQ = Penn State Worry Questionnaire; IDS-SR = Inventory of Depressive Symptomatology—Self Report.

Reliability

Internal consistency. Internal consistency for the Y-BOCS-II Symptom Checklist total score was .91. Calculation of Cronbach's alpha revealed similarly high internal consistency for the Y-BOCS-II Severity Scale (α = .89), as well as the Obsession (α = .86) and Compulsion Severity subscales (α = .84).

Interrater reliability. Interrater reliability for the Y-BOCS-II Severity Scale, calculated on a subset of 68 participants where two raters were present, was high (ICC = .96).

Test-retest reliability. Test-retest reliability, calculated on a subset of participants (*n* = 92) who completed a second rating one week after their initial evaluation, was similarly high (ICC = .85).

Factor Structure

Confirmatory factor analysis. We first tested the two-factor structure comprising the Obsessions and Compulsions factors (Model 1). We included all five items hypothesized to load on the Obsessions factor (Items 1–5), despite the absence of the previous “resistance to obsessions” item and the inclusion of the “obsession-free interval” item (Item 2 on the Y-BOCS-II). Items 1–5 were specified to load on the Obsessions factor and Items 6–10 were specified to load on the Compulsions factor. Results indicate this two-factor model was a poor fit; all goodness-of-fit test statistics failed to meet established guidelines (Table 4). The Obsessions and Compulsions factors were highly correlated (*r* = .80). Factor loadings for the individual items, presented in Table 5, indicate the strongest factor loadings were for Items 1 (time spent on obsessions), 5 (interference from obsessions), 6 (time on compulsions), 9 (distress if compulsions prevented), and 10 (interference from compulsions).

We next tested the two-factor solution that consisted of Interference/Severity and Resistance/Control factors (Model 2). The Interference/Severity factor consisted of Items 1, 2, 3, 6, 7, and 8, whereas the Resistance/Control factor consisted of Items 4, 5, 9, and 10. Once again, the two-factor model was a poor fit, with none of the goodness-of-fit statistics meeting established guidelines (Table 4). The two factors were very strongly correlated (*r* = .92). Factor loadings for the individual items on the Resistance/Control

Table 3
Individual Y-BOCS-II Item Summaries

Y-BOCS-II Item	M	SD	Range	Frequency of endorsement						
				0	1	2	3	4	5	
1. Time on obsessions	2.94	1.17	1–5	0	14	35	42	23	16	
2. Obsession-free interval	3.13	1.02	1–5	0	7	33	32	52	6	
3. Control over obsessions	3.53	0.87	1–5	0	2	14	40	61	13	
4. Distress associated with obsessions	3.08	0.92	1–5	0	5	30	48	43	4	
5. Interference from obsessions	2.89	1.06	0–5	2	10	34	42	38	4	
6. Time on compulsions	2.61	1.00	0–5	1	15	45	46	19	4	
7. Resistance to compulsions	2.97	1.30	0–5	4	18	21	34	41	12	
8. Control over compulsions	3.58	0.90	0–5	1	4	6	38	69	12	
9. Distress if compulsions prevented	3.04	1.00	0–5	2	8	24	47	47	2	
10. Interference from compulsions	2.75	1.17	0–5	4	19	24	44	36	3	

Note. Y-BOCS-II = Yale-Brown Obsessive-Compulsive Scale—Second Edition.

factor were all above .68, although they were more variable but still all above .45 for the Severity/Interference factor (Table 5).

Exploratory factor analysis. Given the absence of a good fit for this data using confirmatory factor analysis, we conducted an exploratory factor analysis. Principal axis factoring with a promax rotation on the Y-BOCS-II yielded two factors with eigenvalues greater than 1 (eigenvalues = 5.21 and 1.30). The two-factor solution was consistent with the deflection in the scree plot. These factors account for 56.82% of the variance in the Y-BOCS-II and can be generally identified as the items associated with the Y-BOCS-II Compulsion (Factor 1) and Obsession (Factor 2) Severity subscales. The only item that did not conform to the separate subscales was Item 5, “interference due to obsessive thoughts.” This item showed a dual loading on both the Obsessions and the Compulsions factors. The pattern matrix for each item on these two factors is presented in Table 6. The pattern matrix is presented to show the factor loadings while accounting for the relationship between factors. Thus, whereas the confirmatory factor analysis with the Obsessions and Compulsions factors was not a good fit, exploratory factor analysis revealed that the Obsessions and Compulsions factors are generally adequate for explaining the latent structure of the data, with the exception of Item 5, which loads on both the Obsessions and the Compulsions factors.

Table 4
Relative Fit of Confirmatory Factor Analysis Models

Model	χ^2	df	p	GFI	NFI	CFI	RMR	RMSEA
1	115.25	34	<.001	.85	.84	.88	.08	.14
2	157.76	34	<.001	.78	.78	.82	.10	.17

Note. Model 1 is Obsessions (Items 1–5) and Compulsions (Items 6–10); Model 2 is Interference/Severity (Items 1–3, 6–8) and Resistance/Control (Items 4, 5, 9, 10). GFI = goodness-of-fit index; NFI = normed fit index; CFI = comparative fit index; RMR = root mean square residual; RMSEA = root mean square error of approximation.

Table 5
Factor Loadings From Confirmatory Factor Analysis Models

Y-BOCS-II Item	Model 1	Model 2
1. Time on obsessions	.80	.73
2. Obsession-free interval	.65	.58
3. Control over obsessions	.65	.63
4. Distress associated with obsessions	.74	.88
5. Interference from obsessions	.83	.73
6. Time on compulsions	.78	.75
7. Resistance to compulsions	.48	.45
8. Control over compulsions	.68	.65
9. Distress if compulsions prevented	.78	.68
10. Interference from compulsions	.87	.88

Note. Y-BOCS-II = Yale-Brown Obsessive-Compulsive Scale—Second Edition. Model 1 is Obsessions (Items 1–5) and Compulsions (Items 6–10); Model 2 is Interference/Severity (Items 1–3, 6–8) and Resistance/Control (Items 4, 5, 9, 10).

Construct Validity

Correlations between study measures are presented in Table 7. Convergent validity was strong between Y-BOCS-II Severity Scale and the CGI-S and NIMH-GOCS measures of OCD severity. The relationship between the Y-BOCS-II Severity Scale score and the OCI-R, although less robust, was also statistically significant. The Y-BOCS-II Severity Scale was also moderately related to depressive symptoms, as measured by the IDS-SR, and to general worry, as measured by the PSWQ. The Obsession Severity subscale of the Y-BOCS-II was only modestly related to general worry and depressive symptoms, whereas the Compulsion Severity subscale was not significantly related to general worry and was less related to depressive symptoms than was the Obsession Severity subscale. Of note, relationships between the Y-BOCS-II Severity Score and clinician-rated OCD symptom severity measures (i.e., CGI-S, NIMH-GOCS) were stronger than those between the Y-BOCS-II Severity Scale and participant-endorsed measures of OCD severity (i.e., OCI-R) and measures of worry and depressive symptoms.

Given that the Y-BOCS items are largely embedded within the Y-BOCS-II, we were able to calculate Y-BOCS scores. The “resistance to obsessions” item was administered at the conclusion

Table 6
Pattern Matrix Values for the Y-BOCS-II

Y-BOCS-II Item	Factor 1 compulsions	Factor 2 obsessions
1. Time on obsessions	–.14	1.00
2. Obsession-free interval	–.19	.85
3. Control over obsessions	.25	.44
4. Distress associated with obsessions	.24	.52
5. Interference from obsessions	.43	.46
6. Time on compulsions	.67	.12
7. Resistance to compulsions	.67	–.19
8. Control over compulsions	.80	–.10
9. Distress if compulsions prevented	.76	.02
10. Interference from compulsions	.73	.16

Note. Y-BOCS-II = Yale-Brown Obsessive-Compulsive Scale—Second Edition. Values above .40 are in bold print.

Table 7
Correlation Matrix for Study Measures

Measure	1	2	3	4	5	6	7	8
1. Y-BOCS-II Severity Scale	.89							
2. Y-BOCS-II Obsessions	.90**	.86						
3. Y-BOCS-II Compulsions	.91**	.63**	.84					
4. CGI-S	.87**	.77**	.81**					
5. NIMH-GOCS	.85**	.75**	.79**	.91**				
6. OCI-R	.22*	.17	.23*	.21*	.24**	.75		
7. PSWQ	.20*	.25**	.12	.15	.21*	.39**	.74	
8. IDS-SR	.35**	.36**	.27**	.25**	.30**	.28**	.52**	.89

Note. Internal consistency measured by Cronbach's alpha is presented on the diagonal. Y-BOCS-II = Yale-Brown Obsessive-Compulsive Scale—Second Edition; CGI-S = Clinical Global Impression—Severity; NIMH-GOCS = National Institute of Mental Health Global Obsessive Compulsive Scale; OCI-R = Obsessive Compulsive Inventory—Revised; PSWQ = Penn State Worry Questionnaire; IDS-SR = Inventory of Depressive Symptomatology—Self Report.

* $p < .05$. ** $p < .01$.

of the Y-BOCS-II interview. Because Y-BOCS ratings of 4 were further divided, Y-BOCS-II ratings of 5 were converted to 4. Thus, to derive the Y-BOCS Severity Scale, the original 10 items were summed as specified in Goodman, Price, Rasmussen, Mazure, Delgado, et al. (1989) and Goodman, Price, Rasmussen, Mazure, Fleischmann, et al. (1989).³ Not surprisingly, the Y-BOCS-II and Y-BOCS were strongly correlated ($r = .97$). The Y-BOCS-II and Y-BOCS were similarly related to scores on the CGI-S ($r_s = .87$ and $.86$, respectively), NIMH-GOCS ($r_s = .85$ and $.85$, respectively), OCI-R ($r_s = .22$ and $.26$, respectively), PSWQ ($r_s = .20$ and $.22$, respectively), and IDS-SR ($r = .35$ and $.33$, respectively).

Discussion

We developed and examined the psychometric properties of the Y-BOCS-II in a large sample of outpatient adults with OCD. Overall, findings indicate that the Y-BOCS-II is a psychometrically sound and valid measure for assessing obsessive-compulsive presence and severity in adults with OCD. Levels of internal consistency for the Severity Scale were high, as were the one-week test-retest reliability and interrater reliability. Of note, the increased range of the Y-BOCS-II (range of item endorsement from 0 to 5 rather than 0 to 4) was frequently used to quantify severe symptoms (see Table 3).

Construct validity was supported in a number of ways. First, the Y-BOCS-II Severity Scale was strongly related to clinician ratings of OCD symptoms severity (i.e., CGI-S, NIMH-GOCS). These associations were stronger than the relations between the Y-BOCS-II Severity Scale and measures of depressive symptoms and worry. Second, factor analysis yielded a two-factor structure generally consistent with the Obsession and Compulsion Severity subscales. The one exception to this—Item 5, interference due to obsessions—demonstrated a dual loading on both factors. This dual loading is congruent with the possibility that there is a strong relationship between distress associated with obsessions and com-

pulsive behaviors. That is, consistent with a cognitive-behavioral conceptualization of OCD (cf. Abramowitz, 2006), compulsions occur in an effort to reduce distress associated with obsessions. In this way, increased obsession-related distress would potentially lead to increased compulsive behaviors and the consequent loading of obsession-related distress on both factors associated with obsessive and compulsive behaviors. More generally, although the scoring format for both the Y-BOCS and the Y-BOCS-II has historically been based on the presumption of an underlying two-factor structure with a higher order factor consisting of overall symptom severity, past studies in the Y-BOCS have not been consistent (e.g., Amir, Foa, & Coles, 2000; Deacon & Abramowitz, 2005; Storch et al., 2005). It is possible that the deletion of the “resistance to obsessions” item and replacement with “obsession-free interval” contributed to the more parsimonious factor composition of the Y-BOCS-II.

Somewhat surprisingly, the Y-BOCS-II Severity Scale correlated weakly with self-reported OCD symptoms on the OCI-R. The OCI-R may be more accurately conceptualized as a measure of symptom presence and associated distress versus symptom severity across a number of unique but related domains. The existence of a statistically significant, albeit modest, relationship between the Y-BOCS-II Severity Scale and measures of worry and depressive symptoms is likely due to the high comorbidity of anxiety and depressive disorders in persons with OCD (Crino & Andrews, 1996; Pinto et al., 2006). Supporting this possibility, correlations of a similar strength were found between the OCI-R and anxiety and depressive symptoms. However, it is fair to note that these modest correlations suggest limited discriminant validity, which is a finding common in psychometric studies of OCD measures (e.g., Deacon & Abramowitz, 2005; McKay et al., 1998; Storch et al., 2007).

This study has several methodological limitations. First, the generality of results is confined to primarily Caucasian, treatment-seeking adults. Second, the retest interval was relatively short (one week) and the longer term reliability of the Y-BOCS-II remains unclear. Third, the factor structure of the Symptom Checklist may differ from that noted in prior studies (Mataix-Cols, Rosario-Campos, & Leckman, 2005) and requires further clarification. Fourth, measures of depressive and anxiety symptoms were all self-report; it would have been preferable to include clinician-rated instruments to assess divergent validity. Finally, the Obsession Severity and Compulsion Severity subscales no longer have item-to-item correspondence. Item symmetry was built into the Y-BOCS on the basis of the belief that as obsessions were reduced, associated compulsions would also lessen in severity. Although there is clearly a functional relationship between obsessions and compulsions, this item-to-item linkage has not proven fruitful, particularly when certain therapies target one symptom domain more than the other or when there is a preponderance of obsessions or compulsions.

Although the psychometric properties of the Y-BOCS-II are promising, a number of areas require further empirical attention.

³ Administering the Y-BOCS-II in this manner allows for a psychometrically sound assessment of symptom severity according to the revised conceptualization of the measure while also enabling comparison to prior studies that used the Y-BOCS.

First, as test–retest reliability was only assessed over a one-week interval, it will be important to examine score stability over longer durations. Second, it will be important to examine Y-BOCS–II ratings in non-OCD psychiatric samples, given that such symptoms can often be seen in other psychiatric disorders (e.g., ritualized behavior in psychosis). Similarly, as there is no assessment of known groups validity (i.e., comparing OCD versus non-OCD anxiety disorders), we highlight this as a limitation and an area in need of future empirical attention. Third, the treatment sensitivity of the Y-BOCS–II should be examined.

Overall, this initial study of the Y-BOCS–II suggests that it is a reliable and valid measure. Although these results do not impinge on the reliability and validity of the Y-BOCS, there may be instances in which the Y-BOCS–II is preferable. First, in cognitive-behavioral therapy, patients are not encouraged to resist obsessions, and thus this item may not be an accurate reflection of psychological health and/or be sensitive to psychosocial treatment effects. Second, studies involving samples of severe, refractory patients (e.g., deep brain stimulation clinical trials) may benefit from the increased scoring range on the Severity Scale. Third, the expanded conceptualization of avoidance may allow for more accurate impressions on clinical severity, as well as more accurate indices of treatment response.

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