Psychological Assessment
1998, Vol. 10, No. 3, 206–214

1040-3590/98/$3.00

The Validation of a New Obsessive–Compulsive Disorder Scale: The Obsessive–Compulsive Inventory

Edna B. Foa and Michael J. Kozak
Allegheny University of the Health Sciences

Paul M. Salkovskis
University of Oxford

Meredith E. Coles and Nader Amir
Allegheny University of the Health Sciences

The Obsessive–Compulsive Inventory (OCI) is a new self-report instrument developed to address the problems inherent in available instruments for determining the diagnosis and severity of obsessive–compulsive disorder (OCD). The OCI consists of 42 items composing 7 subscales: Washing, Checking, Doubting, Ordering, Obsessing (i.e., having obsessional thoughts), Hoarding, and Mental Neutralizing. Each item is rated on a 5-point (0–4) Likert scale of symptom frequency and associated distress. One hundred and forty-seven individuals diagnosed with OCD; 58 with generalized social phobia; 44 with posttraumatic stress disorder; and 194 nonpatients completed the OCI and other measures of OCD, anxiety, and depression. The present article describes the psychometrics of the OCI including (a) scale construction and content validity, (b) reliability (internal consistency and retest reliability), and (c) convergent and discriminant validity. The OCI exhibited satisfactory reliability and validity with all 4 samples.

Several instruments have been developed to measure the content and severity of obsessive–compulsive symptoms. These measures vary in both focus and format. In this article, we examine the available instruments, introduce a new instrument, the Obsessive–Compulsive Inventory (OCI), and describe the OCI's psychometric properties.[1] The OCI was developed to address various limitations of the available instruments.

One of the most commonly used assessments for measuring the severity of obsessive–compulsive disorder (OCD) in research studies is the Yale–Brown Obsessive–Compulsive Scale (Y-BOCS; Goodman et al., 1989). The Y-BOCS severity score is derived from 10 items, each rated on a 5-point scale where 0 denotes *negligible symptoms* and 4, *extreme symptoms.* Five items measure *severity of obsessions* and 5, *severity of compulsions.* The items address time spent on obsessions or compulsions, resistance, interference, distress, and control. The scale yields three severity scores: obsessions, compulsions, and their sum.

Studying the 10 core items of the Y-BOCS with a sample of 40 individuals with OCD, Goodman et al. (1989) estimated the interrater reliability of the Y-BOCS to be excellent (obsessions subtotal, $r = .97$; compulsions subtotal, $r = .96$; and total score, $r = .98$) and its internal consistency to be quite high (mean alpha across four raters = .89). These estimates may be somewhat inflated because they are based on two clinicians rating the same interview rather than on independent interviews. Test–retest reliability has not been studied in large samples. The discriminant validity of the Y-BOCS core items has been found to be poor (Taylor, 1995). Correlations between the Y-BOCS and other measures of depression and anxiety have been found to be as large as the convergent validity correlations, suggesting that the Y-BOCS core items have poor discriminant validity. Self-report forms of the Y-BOCS have been introduced (e.g., Baer, Brown-Beasley, Sorce, & Henriques, 1993), but their psychometric properties have not been ascertained.

Despite the excellent psychometric properties of the core items of the Y-BOCS and their usefulness in treatment outcome research (e.g., DeVeaugh-Geiss, Landau, & Katz, 1989), two limitations are notable. First, the scale was designed to be administered by trained interviewers. This and the time required to complete the interview make its administration costly. Second, the items that contribute to the severity score do not contain information about the specific content of the obsessions and compulsions. This information can be obtained from the Y-BOCS checklist, but the large number of items precludes convenient summation of their nature and relative severity.

Edna B. Foa, Michael J. Kozak, Meredith E. Coles, and Nader Amir, Center for the Treatment and Study of Anxiety, Allegheny University of the Health Sciences; Paul M. Salkovskis, Department of Psychiatry, University of Oxford, Oxford, United Kingdom.

This research was supported by National Institute of Mental Health Grant 45404.

Paul Salkovskis is Welcome Trust Senior Researcher at the University of Oxford, Warneford Hospital, Oxford, United Kingdom. We thank Karen Bogert, Laurie Cashman, Meredith Krause, and Chris Molnar for their contributions to this project.

Correspondence concerning this article should be addressed to Edna B. Foa, Center for the Treatment and Study of Anxiety, Allegheny University of the Health Sciences, 3200 Henry Avenue, Philadelphia, Pennsylvania 19129. Electronic mail may be sent to foa@auhs.edu.

[1] Copies of the OCI are available from the correspondence author, Edna B. Foa, Center for the Treatment and Study of Anxiety, Allegheny University of the Health Sciences, 3200 Henry Avenue, Philadelphia, Pennsylvania 19129.

Several self-report measures of OCD are available (for a comprehensive review, see Taylor, 1995). Originally, a card-sort task designed to measure obsessional traits and symptoms, the Leyton Obsessional Inventory (LOI), had good psychometric properties (αs = .75 to .90; test–retest reliability, r = .87 for the symptom score, and r = .91, for the trait score; Cooper, 1970). The LOI was shown to have good discriminant validity, with correlations between the LOI subscales and non-obsessive–compulsive (OC) measures being smaller than the correlations with other measures of OCD (Taylor, 1995).

Despite its strengths, the LOI has some drawbacks. First, it was developed with homemakers rather than with OCD patients. Therefore it may be less applicable to clinical OCD than to subclinical symptoms. Second, the card-sort procedure is somewhat cumbersome. Third, the LOI has often proved insensitive to symptom reductions that were evident in other measures (Allen & Rack, 1975; Ananth, Solyom, Bryntwick, & Krishnappa, 1979). Finally, the three subscales of the LOI are highly correlated (mean r = .81, range = .70 to .91), suggesting that they do not reflect distinct factors (Taylor, 1995). The Lynfield Obsessional/Compulsive Questionnaire (*LOCQ*) is a shorter, questionnaire version of the LOI, but its psychometric properties are unknown. (Allen, 1977; Allen & Tune, 1975).

The Compulsive Activity Checklist (CAC), originally called the Obsessive–Compulsive Interview Checklist (Marks, Hallam, Connolly, & Philpott, 1977), has been proposed in various forms. A 38-item questionnaire version, which uses a 4-point rating scale, was developed by Foa, Steketee, Grayson, Turner, and Latimer (1984). Its interrater reliability was estimated to be .94, and it successfully discriminated washers from checkers (85% correct identification) by use of the Washing and Checking subscales derived from a factor analysis (Freund, Steketee, & Foa, 1987). The CAC is limited in that it addresses compulsions but not obsessions and that the items focus narrowly on washing and checking rituals.

The Maudsley Obsessive–Compulsive Inventory (MOCI: Hodgson & Rachman, 1977) is a 30-item true–false questionnaire, with satisfactory test–retest reliability (r = .80) and internal consistency (.70 to .80; Rachman & Hodgson, 1980). Four subscales were identified through factor analysis: Washing, Checking, Slowness, and Doubting. Scores for each subscale indicate severity of each symptom class. Satisfactory external validity was found for the Washing and Checking subscales, but support for the Slowness and Doubting subscales was weaker. Two limitations of the MOCI are (a) the true–false format restricts the sensitivity of the scale to severity of specific symptoms and thus to change in severity posttreatment, and (b) the items of the MOCI encompass only two of the behavioral compulsions (i.e., checking and washing) and do not tap specific obsessions other than contamination. Thus, although the MOCI seems to address better the heterogeneity of OCD through its four subscales than do other available instruments, the subscales capture only a subset of OCD symptoms, and only two (i.e., Washing and Checking) are of demonstrated validity.

Another questionnaire, the Padua Inventory (PI; Sanavio, 1988) contains 60 items, each rated on a 0–5 scale, that describe common obsessions and behavioral compulsions. The PI yields four factors: Impaired Mental Control, Contamination, Checking, and Loss of Control of Actions (Sanavio, 1988). Test–retest reliability (r = .78) and internal consistency (α = .90) are satisfactory, and the total score discriminates individuals with OCD from individuals with other neurotic disorders (Sanavio, 1988). Although several studies have examined the factors involved in the PI (e.g., Burns, Keortge, Formea, & Sternberger, 1995), these variables were validated primarily with college students. Furthermore, the PI does not encompass certain categories of obsessions and compulsions, such as neutralizing and hoarding.

The Obsessive Thoughts Checklist (Cottraux, 1989) is a 28-item inventory of obsessions. Its psychometric properties were studied with a sample of 59 patients (22 with OCD, 21 with depression, 16 with phobias) and 21 controls: Test–retest reliability and internal consistency were satisfactory (r = .80, α = .94). A factor analysis revealed two factors, Perfectionism and Pathological Responsibility. Two disadvantages of the Obsessive Thoughts Checklist are that it addresses only obsessions and that it was evaluated with a modest sample of 22 individuals with OCD.

The present article describes the OCI that was developed (a) to encompass the heterogeneous content of obsessions and compulsions presented by individuals with OCD; (b) to allow for a wide range of severity scores to afford comparisons among the severity of various obsessions and compulsions; and (c) to provide an instrument that can be readily administered to both clinical and nonclinical populations. Accordingly, the OCI includes seven subscales that address the heterogeneity of obsessions and compulsions observed in OCD. Thus, it is designed to be more comprehensive than existing instruments. Each item of the OCI is rated on a 0–4 Likert scale to provide a wide range of severity for each item and each subscale and thus optimize its sensitivity. Of importance, the OCI not only furnishes information about overall OCD severity through the total score, but it also addresses the relative severity of the different obsessions and compulsions endorsed. An additional advantage of the OCI over existing instruments lies in its validation with samples of patients who were diagnosed by experts as having OCD and other anxiety disorders, as well as with nonpsychiatric controls. Thus, the OCI is intended to be applicable to the general population in assessing subclinical obsessional thoughts and behaviors.

Study 1: Content Validity and Internal Consistency

In this section, we describe the content validity of the OCI and its internal consistency. We report normative scores of the OCI in four samples: individuals with OCD, individuals with other anxiety disorders, that is, posttraumatic stress disorder (PTSD) and generalized social phobia (GSP), and a nonpatient control sample.

Method

Participants. One hundred fourteen individuals diagnosed with OCD, 58 with GSP, 44 with PTSD, and 194 nonpatient controls completed the OCI, as well as other measures of OCD, anxiety, and depression. Age, gender, and years of education for the sample are summarized in Table 1.

Development of the OCI. Edna B. Foa, Michael J. Kozak, and Paul M. Salkovskis formulated the original item pool. First, to ensure that

Table 1
Sample Characteristics

	OCD		GSP		PTSD		Control	
Group	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Age	33.2_a	10.9	38.7_b	9.9	30.9_a	9.5	20.3_c	5.7
Education	14.7_a	3.0	15.3_a	2.4	13.2_b	3.7	13.6_b	0.9
% Women	51%		45%		100%		67%	

Note. Means with different subscripts differ significantly. OCD = obsessive–compulsive disorder; GSP = general social phobia; PTSD = posttraumatic stress disorder.

the items of the OCI reflected the symptoms of OCD, seven subscales were constructed to represent the major symptoms of OCD as found in the *Diagnostic and Statistical Manual of Mental Disorders* (4th ed.; *DSM–IV;* American Psychiatric Association, 1994) field trial for OCD (Foa et al., 1995). The subscales were Washing (8 items; e.g., "I think contact with bodily secretions [perspiration, saliva, blood, urine, etc.] may contaminate my clothes or somehow harm me"), Checking (9 items; e.g., "I repeatedly check doors, windows, drawers, etc."), Doubting (3 items; e.g., "I ask people to repeat things to me several times, even though I understood them the first time"), Ordering (5 items; e.g., "I need things to be arranged in a particular order"), Obsessing (8 items; e.g., "I have thoughts that I might want to harm myself or others"), Hoarding (3 items; e.g., "I collect things I don't need"), and Mental Neutralizing (6 items; e.g., "I need to pray to cancel bad thoughts or feelings"). These categories correspond to the content domains of the six most common primary obsessions and the six most common primary compulsions. The subscales for more common symptom categories were longer than those for rarer symptoms. Each item is rated on a 0–4 Likert scale for frequency of occurrence and distress. Distress and frequency ratings were both included with the assumption that they would be imperfectly correlated and reflect complementary aspects of OCD severity.

Measures. The SCID–III–R (Spitzer, Williams, Gibbon, & First, 1990) and SCID–IV (First, Spitzer, Gibbon, & Williams, 1995) are semistructured diagnostic interviews to determine *DSM–III–R* (American Psychiatric Association, 1987) and *DSM–IV* (American Psychiatric Association, 1994) diagnoses. Both interviews are administered by a clinician and include an introduction and distinct modules. The completion of the interviews results in a record of the presence or absence of each disorder being considered for both a current episode and lifetime history.

The Y-BOCS (Goodman et al., 1989) is a semistructured interview that assesses symptom severity and treatment responses of OCs. The scale and its psychometric properties were described in the introduction.

Procedure. The assessment for OCD was conducted as follows. First, all individuals who presented to The Center for the Treatment and Study of Anxiety, Philadelphia, Pennsylvania, for evaluation of OCD completed a series of self-report questionnaires including the OCI. Diagnosis of OCD was then assessed in a two-stage process in which each patient was interviewed separately by two assessors. Each patient was first interviewed for 2 hr by a doctoral level clinical psychologist experienced in diagnosing OCD. This assessment interview included the Y-BOCS (Goodman et al., 1989) and The Hamilton Depression Scale (HAM–D; Hamilton, 1960). On completion of this intake, the first assessor presented the interview data to a senior clinician (i.e., Edna B. Foa, Michael J. Kozak). The patient was then interviewed by the senior clinician who confirmed the diagnosis of OCD. Although interrater reliability was not assessed directly in this study, previous research that used this same assessment method at our center has revealed satisfactory interrater agreement for the Y-BOCS severity score (Foa et al., 1995).

All individuals evaluated for PTSD and GSP at The Center for the Treatment and Study of Anxiety also completed a series of self-report questionnaires including the OCI, followed by structured clinical interviews (SCID; First et al., 1995). To increase diversity, we recruited nonpatient volunteers from three sources: (a) undergraduate students who scored in the normal range on the Beck Depression Inventory (BDI; Beck, Steer, & Garbin, 1988) and the Spielberger State–Trait Anxiety Inventory (STAI; Spielberger, 1983) from the University of Virginia (31%); (b) undergraduate, graduate, and medical students from Allegheny University of the Health Sciences (54%); and (c) hospital staff who received the SCID and had no Axis I diagnoses (15%).

Results

Means and standard deviations in various samples: Distress scores. Means and standard deviations were calculated for the total distress score and for the seven subscales. This was done separately for the four diagnostic groups and for the total sample. These data are presented in Table 2.

Means and standard deviations in various samples: Frequency scores. Means and standard deviations were calculated for the total frequency score and for the seven subscales. This was done separately for the four diagnostic groups and for the total sample. These data are presented in Table 3.

Internal consistency. The full scales and most of the subscales have satisfactory internal consistency. Alpha coefficients were calculated for the OCI total scores for the frequency and distress ratings. Alpha coefficients were also calculated for frequency and distress for each of the seven subscales. These data are presented in Table 4. The alpha coefficients of the full scale for each group were all high (range .86 to .95), indicating that the distress and frequency items within each subscale converge on a common construct. Regarding the subscales, all but 6 of the 56 coefficients exceeded .70.

Intercorrelations among symptom subscales and total score. The correlations among each of the seven subscales and the total OCI score, calculated separately for the distress and frequency scores for each group are presented in Table 5. As is apparent from Table 5, the correlations in the OCD sample were generally lower than those in the other samples. This may be due to the heterogeneity of the symptom presentation among individuals with OCD, such that they typically exhibit high scores on some subscales and low scores on others. People without OCD, on the other hand, are expected to exhibit low scores on all of the OCI subscales.

Discussion

The coherence of the OCI and its subscales is suggested by the high internal consistency of the subscales. The sole exception was the Neutralizing subscale, which had modest internal consistency in the non-OCD samples. Because neutralizing is rare in individuals without OCD, the diminished alpha coefficient for the Neutralizing subscale in the present non-OCD sample may reflect restricted range rather than structural inadequacy.

Of interest, distress and frequency were more positively correlated in the OCD group than in the non-OCD groups: Symptom frequency was higher than the associated distress in the non-OCD groups. It thus appears that although individuals without OCD sometimes experience intrusive ideas and perform super-

Table 2
Means and Standard Deviations for Subscale and Total Score of the Obsessive–Compulsive Inventory Distress Ratings

	Group									
	OCD (n = 99)		GSP (n = 57)		PTSD (n = 41)		Control (n = 126)		Entire sample (n = 324)	
Subscale	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Washing	1.44_a	1.3	0.32_b	0.4	0.45_b	0.6	0.55_b	0.7	0.77	1.0
Checking	1.51_a	0.9	0.31_b	0.4	0.47_b	0.5	0.52_b	0.5	0.78	0.8
Doubting	1.84_a	1.3	0.63_b	0.8	0.72_b	1.0	0.65_b	0.8	1.02	1.1
Ordering	1.87_a	1.2	0.65_b	0.8	0.60_b	0.7	0.80_b	0.8	1.07	1.1
Obsessing	1.79_a	1.1	0.71_c	0.7	1.18_b	1.0	0.60_c	0.6	1.06	1.0
Hoarding	1.24_a	1.3	$0.77_{b,c}$	0.9	0.53_b	0.8	$1.06_{a,c}$	0.8	1.00	1.0
Mental Neutralizing	1.38_a	1.0	0.46_b	0.5	0.50_b	0.6	0.41_b	0.5	0.73	0.8
Total score	66.33_a	31.9	21.18_b	20.2	26.95_b	23.9	25.25_b	20.8	37.31	31.5

Note. Means with different subscripts differ from each other. Subscale scores range from 0 to 4 and represent the mean rating for that subscale. The total score ranges from 0 to 168. OCD = obsessive–compulsive disorder; GSP = generalized social phobia; PTSD = posttraumatic stress disorder.

stitious actions, they do not report being so distressed by them as do those with OCD. These results are consistent with the findings reported by Rachman and DeSilva (1978).

Study 2: Test–Retest Reliability

In this section, we report on the test–retest reliability of the OCI.

Method

Participants were 41 individuals with OCD (8 of whom participated in Study 1) and 57 nonpatient controls, all of whom participated in Study 1. Participants with OCD had a mean age of 34.3 years; 31% were women. Controls had a mean age of 19.3 years; 93% were women. The intertest interval was approximately 2 weeks for people with OCD and 1 week for controls.

Results

The stability of the OCI over time was assessed by computing Pearson correlation coefficients. Overall reliabilities for total scores and subscale scores were satisfactory. These data are presented in Table 6. This analysis revealed high test–retest reliability for the controls, distress (OCD, r = .87; controls, r = .89) and frequency (OCD, r = .84; controls, r = .90) total

Table 3
Means and Standard Deviations for Subscale and Total Score of the Obsessive–Compulsive Inventory Frequency Ratings

	Group									
	OCD (n = 47)		GSP (n = 57)		PTSD (n = 43)		Control (n = 124)		Entire sample (n = 271)	
Subscale	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Washing	1.44_a	1.4	0.48_b	0.6	$0.76_{b,c}$	0.8	0.76_c	0.7	0.82	0.9
Checking	1.51_a	0.9	0.54_b	0.5	0.78_b	0.6	0.72_b	0.5	0.83	0.7
Doubting	2.01_a	1.1	0.72_b	0.8	0.81_b	0.9	0.78_b	0.8	0.98	1.0
Ordering	1.87_a	1.1	0.94_b	0.9	0.93_b	0.9	1.08_b	0.8	1.16	1.0
Obsessing	1.67_a	0.8	0.71_b	0.6	1.08_c	0.9	0.69_b	0.6	0.93	0.8
Hoarding	1.22_a	1.1	1.29_b	1.0	0.80_a	1.0	1.52_b	0.9	1.31	1.0
Mental Neutralizing	1.49_a	0.9	0.61_b	0.6	0.74_b	0.7	0.64_b	0.6	0.80	0.8
Total score	66.36_a	29.4	28.81_b	22.1	35.70_b	26.0	34.15_b	21.2	8.86	26.9

Note. Means with different subscripts differ from each other. Subscale scores range from 0 to 4 and represent the mean rating for that subscale. The total score ranges from 0 to 168. OCD = obsessive–compulsive disorder; GSP = generalized social phobia; PTSD = posttraumatic stress disorder.

Table 4
Coefficient Alpha for Obsessive–Compulsive Inventory Subscales and Total Score

	Group							
	OCD		GSP		PTSD		Control	
Subscale	D (n = 98)	F (n = 47)	D (n = 56)	F (n = 56)	D (n = 39)	F (n = 41)	D (n = 126)	F (n = 124)
Washing	0.94	0.96	0.79	0.84	0.84	0.83	0.91	0.85
Checking	0.86	0.87	0.77	0.83	0.59	0.66	0.84	0.79
Doubting	0.86	0.82	0.85	0.84	0.82	0.78	0.82	0.76
Ordering	0.84	0.79	0.87	0.87	0.76	0.82	0.85	0.82
Obsessing	0.68	0.81	0.81	0.80	0.84	0.88	0.82	0.82
Hoarding	0.90	0.87	0.89	0.82	0.84	0.81	0.82	0.83
Mental Neutralizing	0.76	0.72	0.69	0.71	0.64	0.59	0.70	0.74
Total	0.92	0.93	0.95	0.95	0.86	0.93	0.95	0.94

Note. D = Distress; F = Frequency; OCD = obsessive–compulsive disorder; GSP = generalized social phobia; PTSD = posttraumatic stress disorder.

scores. The test–retest reliability for the subscales exceeded .80, with the exception of the Ordering distress (r = .77) and Ordering frequency scores (r = .79) in the OCD sample and the Doubting distress (r = .77) and Hoarding distress (r = .68) scores in the control sample.

Discussion

Results of Study 2 revealed that the OCI has good test–retest reliability for total scores of symptom frequency and distress in individuals with OCD and in nonpatient populations. The subscales of the OCI also demonstrated satisfactory test–retest reliability.

Study 3: Discriminative and Convergent Validity

In this section, we report on the discriminative and convergent validity of the OCI using the four samples described in Study 1.

Method

In addition to the OCI and before the diagnostic interview, participants completed the MOCI, the CAC, the BDI, the Beck Anxiety Inventory (BAI; Beck, Epstein, Brown, & Steer, 1988), and the STAI. These scales are described below.

The Maudsley Obsessive–Compulsive Inventory. The MOCI (Hodgson & Rachman, 1977) is a true–false self-report questionnaire that assesses overt rituals and their related obsessions and includes four subscales. The scale and its psychometric properties were described in the introduction.

The Compulsive Activity Checklist. The CAC (Freund et al., 1987) used in this study consisted of 38 items. This scale focuses on specific behaviors that assess compulsions. The scale and its psychometric properties were described in the introduction.

The Beck Depression Inventory. The BDI (Beck, Steer, et al., 1988) is a 21-item self-report scale used to assess cognitive and physical symptoms of depression. It has been used extensively in psychological research with numerous populations and psychiatric disorders, including the anxiety disorders.

The Beck Anxiety Inventory. The BAI (Beck, Epstein, et al., 1988)

Table 5
Intercorrelations Among Obsessive–Compulsive Inventory Subscales and Total Score for Distress and Frequency Ratings

	Subscales						
Total score	Washing	Checking	Doubting	Ordering	Obsessing	Hoarding	Mental Neutralizing
Distress							
OC (n = 99)	.61	.82	.69	.69	.59	.44	.72
GSP (n = 57)	.83	.89	.83	.87	.87	.64	.84
PTSD (n = 42)	.76	.81	.85	.69	.84	.73	.83
Controls (n = 126)	.80	.88	.73	.80	.77	.65	.82
Frequency							
OC (n = 47)	.76	.73	.69	.70	.49	.42	.63
GSP (n = 57)	.83	.88	.84	.84	.87	.59	.82
PTSD (n = 43)	.74	.87	.81	.63	.88	.63	.85
Controls (n = 124)	.76	.89	.72	.82	.82	.58	.83

Note. OC = obsessive–compulsive group; GSP = generalized social phobia group; PTSD = posttraumatic stress disorder group.

Table 6
Test–Retest Reliability for Obsessive–Compulsive Inventory Subscales and Total Score

Subscale	OC group D (n = 41)	OC group F (n = 41)	Controls D (n = 56)	Controls F (n = 57)
Washing	0.97	0.95	0.86	0.88
Checking	0.88	0.84	0.82	0.82
Doubting	0.85	0.82	0.77	0.86
Ordering	0.77	0.79	0.83	0.87
Obsessing	0.89	0.88	0.80	0.88
Hoarding	0.82	0.86	0.68	0.84
Mental Neutralizing	0.87	0.86	0.80	0.85
Total	0.87	0.84	0.89	0.90

Note. D = distress; F = frequency; OC = obsessive–compulsive.

is a 21-item self-report inventory designed to assess the severity of anxiety symptoms in adults and adolescents. In their initial investigation with a psychiatric outpatient sample, Beck, Epstein, et al. (1988) identified two factors: Somatic and Subjective Anxiety or Panic. These factors were found to have good internal consistency, test–retest reliability, and convergent and divergent validity.

The Spielberger State–Trait Anxiety Inventory. The STAI (Spielberger, 1983) is a 40-item self-report scale, with 20 items assessing state anxiety and 20 items assessing trait anxiety.

The Hamilton Depression Scale. The HAM–D (Hamilton, 1960) is a 17-item scale of depressive symptoms. The total score ranges from 0 to 78, and the scale has been shown to have strong interrater reliability (.90; Hamilton, 1960).

The instruments used in the interview, the Y-BOCS and the HAM–D, and the self-report instruments were selected to examine the convergent and discriminative validity of the OCI. Specifically, the Y-BOCS, MOCI, and CAC were used to assess the convergence of the OCI with existing measures of OCD. Additional measures were used to assess the divergence of the OCI from measures of depression (BDI, HAM–D), severity of general anxiety (BAI), and state and trait anxiety (STAI).

Results

Discriminative validity: Comparison of diagnostic groups on distress. Comparisons of means for the total distress score revealed that the OCD group reported greater distress on the OCI than did the other three groups. A 4 (Group: OCD, GSP, PTSD, NPC) × 7 (Subscale: Washing, Checking, Doubting, Ordering, Obsessing, Hoarding, Mental Neutralizing) multivariate analysis of variance (MANOVA) revealed main effects of Group, $F(3, 317) = 55.96$, $p < .001$, and Subscale, $F(6, 312) = 28.53$, $p < .001$, Pillai's = 0.35; that were modified by a Group × Subscale interaction, $F(18, 942) = 4.58$, $p < .001$, Pillai's = 0.24.

The OCD group reported more distress than the other groups on all but the Hoarding subscale, on which the OCD group scored higher than the PTSD and GSP groups but not higher than controls. Simple effects of subscale were probed with one-way analyses of variance (ANOVAs) that revealed group differences on all subscales: Washing, $F(3, 319) = 27.09$, $p < .001$; Checking, $F(3, 319) = 56.57$, $p < .001$; Doubting, $F(3, 318) = 32.67$, $p < .001$; Ordering, $F(3, 319) = 36.95$, $p < .001$; Obsessing, $F(3, 319) = 40.57$, $p < .001$; Mental Neutralizing, $F(3, 318) = 40.61$, $p < .001$; and Hoarding, $F(3, 319) = 6.07$, $p < .001$. On Washing, Checking, Doubting, Ordering, and Mental Neutralizing, the PTSD, GSP, and control groups did not differ from one another. However, on the Obsessing subscale, the PTSD group scored higher than the GSP and control groups but lower than the OCD group. No consistent pattern emerged on the Hoarding subscale. Newman–Keuls tests are summarized in Table 2: Significant differences are indicated by different subscripts.

Because the different samples varied from one another in their gender composition, we have conducted parallel analyses with women only. This analysis revealed patterns similar to those found with the full samples for the distress total score and all subscales except Hoarding. For the full samples, participants with OCD differed from all groups except the control group. Women with OCD had significantly higher scores than did women with PTSD, but not those with GSP or NPC.

A cutoff score of 40 on distress allowed correct identification of 80% of patients with OCD and 80% of the participants without OCD.

Discriminative validity: Comparison of diagnostic groups on frequency. Comparisons of means revealed that the OCD group reported more frequent OCD symptoms than did the remaining 3 groups on all but the Hoarding subscale. A 4 (Group: OCD, GSP, PTSD, NPC) × 7 (Subscale: Washing, Checking, Doubting, Ordering, Obsessing, Hoarding, Mental Neutralizing) MANOVA revealed significant main effects of group, $F(3, 256) = 22.29$, $p < .001$, and subscale, $F(6, 260) = 17.08$, $p < .001$, Pillai's = .28; modified by an interaction of Group × Subscale; $F(18, 786) = 5.83$, $p < .001$, Pillai's = .35.

Simple effects of subscale were probed with one-way ANOVAs that revealed significant group differences on all subscales: Washing, $F(3, 267) = 11.95$, $p < .001$; Checking, $F(3, 267) = 24.06$, $p < .001$; Doubting, $F(3, 267) = 25.95$, $p < .001$; Ordering, $F(3, 267) = 12.27$, $p < .001$; Obsessing, $F(3, 266) = 27.71$, $p < .001$; Mental Neutralizing, $F(3, 266) = 19.64$, $p < .001$; and Hoarding, $F(3, 267) = 5.63$, $p < .001$.

On Checking, Doubting, Ordering, and Mental Neutralizing, the comparison groups did not differ from one another. However, on Obsessing, participants with PTSD exhibited a higher score than did the other comparison groups but did not score as high as did participants with OCD. An inconsistent picture emerged on the Hoarding subscale. Newman–Keuls tests are summarized in Table 3; significant differences are noted by subscript. Parallel analyses were conducted for women only. These revealed patterns similar to those of the full samples for the frequency total score and all subscales.

Comparison of diagnostic groups for frequency and distress. As expected, PTSD, GSP, and control groups scored higher on frequency ratings than on distress ratings, whereas the OCD group scored high on both types of ratings. A 4 (Group) × 2 (Rating: frequency, distress) ANOVA on the OCI total revealed significant effects of group, $F(3, 184) = 24.21$, $p < .001$, and rating, $F(1, 184) = 94.36$, $p < .001$, modified by a Group × Rating interaction, $F(3, 184) = 6.38$, $p < .001$. Simple effects analyses of rating type revealed that all but the OCD group exhibited higher frequency than distress scores: OCD, $t(31) = 1.01$, $p = .32$; GSP, $t(56) = 6.90$, $p < .001$; PTSD, $t(41) =$

4.85, $p < .001$; controls, $t(56) = 8.26$, $p < .001$. Simple effects analyses of group revealed that groups differed on the total distress score, $F(3, 320) = 64.70$, $p < .001$; and total Frequency score, $F(3, 267) = 26.26$, $p < .001$. Follow-up Newman–Keuls revealed that the OCD group had higher scores than the other groups on both distress and frequency and that the 3 comparison groups did not differ from one another.

Convergent validity of the OCI with other measures of OCD. The validity of the OCI total distress and frequency scales was assessed by correlating (Pearson correlations) the OCI scores of OCD patients with scores obtained on other measures of OCD symptoms: Y-BOCS, CAC, MOCI. The same analysis was conducted for the control group, with use of scores on the Y-BOCS self-report and the MOCI. These data are presented in Table 7.

Inspection of the correlations for OCD patients indicated that the OCI was highly correlated with the other self-report measures of OCD symptoms (CAC and MOCI). However, whereas the correlations with the Y-BOCS total score obtained by an interview were significant, the coefficients were quite low, especially for the distress scores. In the control group, where the Y-BOCS scores were obtained by a questionnaire version, the corresponding coefficients were higher than those found in the OCD sample.

The validity of the OCI subscales for the distress and frequency versions was assessed by correlating the OCI subscales of Washing, Checking, and Doubting with the corresponding subscales of the CAC and the MOCI (Pearson correlations). These data are presented in Table 8.

For the OCD sample, the coefficients were quite high, ranging from .41 with Checking–CAC to .93 with Washing–MOCI. The coefficients for the control group were also satisfactory, ranging from .53 with Doubting–MOCI to .69 with Washing–MOCI.

Convergent validity of OCI and other measures of psychopathology. Table 9 presents the correlations between the scores obtained from the OCI distress and frequency versions and other measures of psychopathology.

For the OCD group there was a significant correlation between the OCI total distress and frequency scores and trait anxiety (as measured by the BAI) and between OCI total distress scores and depression (as measured by the HAM–D). For the control group, OCI total scores on both the distress and frequency versions were significantly correlated with state anxiety (as measured by the STAI–Trait and the BAI) and depression (as measured by the BDI).

To examine further the relationship of the OCI with other measures of OCD in a full range of participants, we combined the OCD group and the control group and performed the analyses described above; these results are presented in Table 7. These analyses revealed that there was a much stronger relationship between the OCI and other measures of OCD symptoms when a full range of symptoms was represented.

Discriminative validity: Comparison of diagnostic groups on frequency weighted distress score. A frequency-weighted distress score was computed to incorporate both frequency and distress information into a single score that weighted the distress reported for each symptom by the frequency rating for that particular symptom (and vice versa). This composite score was calculated as the sum of products of each item's frequency and distress scores. This frequency-weighted distress score was shown to correctly classify 92% of the OCD group as having OCD and 86% of the group with GSP, 88% of the group with PTSD, and 86% of the control group as not having OCD.

Discussion

Several indexes demonstrate the high validity of the OCI, which shows good discriminative validity. Indeed, the total OCI distress and frequency scores for the OCD group exceeded those of the GSP, PTSD, and control groups. The subscale scores, except Hoarding, were also higher for the OCD group. Of interest, on the Obsessing subscale, the PTSD group scored higher than the GSP and control groups, suggesting that this particular subscale may be sensitive to trauma-related intrusions that characterize PTSD as well as to obsessions of OCD. The only problematic subscale was Hoarding: The GSP and control groups scored as high as the OCD group on symptom frequency. Thus, the Hoarding items do not adequately distinguish pathological hoarding from ordinary collecting, and this subscale requires revision. Parallel analyses for women revealed similar patterns to those of the full samples.

Satisfactory convergent validity is indicated by positive corre-

Table 7
Correlation of the Obsessive–Compulsive Inventory With Other Measures of Obsessive–Compulsive Disorder (OCD) Symptoms

	Group					
	OCD		Control		OCD and Controls combined	
Measures	D	F	D	F	D	F
Y-BOCS						
Total	.23 (n = 99)*	.43 (n = 47)**	.55 (n = 125)**	.49 (n = 122)**	.68 (n = 225)**	.64 (n = 171)**
Obsessions	.14 (n = 99)	.31 (n = 47)*	.47 (n = 125)**	.52 (n = 122)**	.65 (n = 225)**	.64 (n = 171)**
Compulsions	.25 (n = 99)*	.41 (n = 47)**	.44 (n = 125)**	.29 (n = 122)**	.66 (n = 225)**	.59 (n = 171)**
CAC total	.65 (n = 50)**	.67 (n = 17)**				
MOCI total	.68 (n = 65)**	.75 (n = 43)**	.66 (n = 126)**	.72 (n = 124)**	.77 (n = 191)**	.81 (n = 167)**

Note. Y-BOCS = Yale–Brown Obsessive–Compulsive Scale; CAC = Compulsive Activity Checklist; MOCI = Maudsley Obsessive–Compulsive Inventory; D = distress; F = frequency.
* $p < .05$. ** $p < .01$.

Table 8
Correlation Between Subscales of the Obsessive–Compulsive Inventory and Subscales of Other Measures of Obsessive–Compulsive Disorder (OCD)

	Group							
	OCD				Controls			
	D		F		D		F	
Subscale	*r*	*n*	*r*	*n*	*r*	*n*	*r*	*n*
Washing								
MOCI	.84	61	.93	42	.68	125	.69	123
CAC	.60	50	.61	17				
Checking								
MOCI	.72	60	.68	41	.65	126	.63	124
CAC	.60	50	.41	17				
Doubting								
MOCI	.49	58	.56	38	.53	125	.63	124

Note. All p values $<.01$. MOCI = Maudsley Obsessive–Compulsive Inventory; CAC = Compulsive Activity Checklist; D = distress; F = frequency.

lations of the OCI total score with the total scores of the MOCI and the CAC. These findings suggest that although the OCI assesses a wider range of OCD symptoms than other OCD questionnaires, this does not compromise reliability in assessing OCD severity. Furthermore, the Washing and Checking subscales of the OCI and of the MOCI are also positively correlated.

Although the OCI was positively correlated with measures of depression and anxiety, the correlations were weaker than those for other measures of OCD symptoms. The moderate correlations of the OCI with measures of depression and general anxiety as compared with the high correlations of the OCI with the MOCI and CAC attest to its divergent validity. Thus, although there is some shared variability, the OCI measures more than depression and anxiety. Notably, for the OCD group, the OCI distress score was positively correlated with depression, whereas the symptom frequency score was not.

General Discussion

The present article describes the development and validation of the OCI as an efficient multipurpose self-report measure that can be used for diagnostic screening, symptom profiling, and severity determination. It has excellent internal consistency and satisfactory test–retest reliability for both symptom frequency and associated distress in individuals with OCD and in nonpatient controls. In addition, the OCI corresponds well with other measures of OCD symptoms and distinguishes individuals with OCD from those with other anxiety disorders and controls.

Where do we go from here? First, the Hoarding subscale requires revision to increase its discriminative validity. We plan to formulate Hoarding items that differentiate excessive hoarding from routine collecting. Second, we plan to evaluate the sensitivity of the OCI to treatment effects. Finally, we plan

Table 9
Correlation Between Obsessive–Compulsive Inventory and Other Measures of Psychopathology

	Group							
	OCD				Controls			
	D		F		D		F	
Measure	*r*	*n*	*r*	*n*	*r*	*n*	*r*	*n*
Anxiety								
STAI–Trait					.46**	56	.44**	56
BAI	.63**	92	.49**	47	.65**	70	.60**	67
Depression								
BDI					.44**	126	.50**	124
HAM–D	.31**	78	.15	43				

Note. STAI = Spielberger State–Trait Anxiety Inventory; BAI = Beck Anxiety Inventory; BDI = Beck Depression Inventory; HAM–D = Hamilton Depression Scale; OCD = obsessive–compulsive disorder; D = distress; F = frequency.
* $p < .05$. ** $p < .01$.

to develop a shorter version of the OCI to make it more useful as a screen for OCD in a variety of settings.

The OCI is a promising new instrument. Its administration requires no technical expertise and typically takes about 15 min. It surveys a broad range of OCD symptoms and yields a profile of frequency and distress for each symptom class, as well as an estimate of overall OCD severity. Good reliability and validity of the OCI and its subscales have been demonstrated with clinical and nonclinical samples. The scale accurately detects OCD and is sensitive to nonclinical OCD symptoms. We believe that with refinement and further validation, the OCI can fulfill its promise as a useful self-report inventory of OCD.

References

Allen, J. J. (1977). The measurement of obsessionality: First validation studies of the Lynfield obsessional/compulsive questionnaire. *Journal of International Medical Research, 5,* 12–15.

Allen, J. J., & Rack, P. H. (1975). Changes in obsessive–compulsive patients as measured by the Leyton inventory before and after treatment with clomipramine. *Scottish Medical Journal, 20(Suppl. 1),* 41–44.

Allen, J. J., & Tune, G. S. (1975). The Lynfield Obsessional Compulsive Questionnaire. *Scottish Medical Journal, 20,* 25–28.

American Psychiatric Association. (1987). *Diagnostic and statistical manual of mental disorders* (3rd ed., rev.). Washington, DC: Author.

American Psychiatric Association. (1994). *Diagnostic and statistical manual of mental disorders* (4th ed.). Washington, DC: Author.

Ananth, J., Solyom, L., Bryntwick, S., & Krishnappa, U. (1979). Chlorimiparmine therapy for obsessive–compulsive neurosis. *American Journal of Psychiatry, 136,* 700–701.

Baer, L., Brown-Beasley, M. W., Sorce, J., & Henriques, A. I. (1993). Computer-assisted telephone administration of a structured interview for obsessive–compulsive disorder. *American Journal of Psychiatry, 150,* 1737–1738.

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., & Garbin, M. G. (1988). Psychometric properties of the Beck Depression Inventory: Twenty-five years of evaluation. *Clinical Psychology Review, 8,* 77–100.

Burns, G. L., Keortge, S. G., Formea, G. M., & Sternberger, L. G. (1995). Revision of the Padua Inventory of obsessive–compulsive disorder symptoms: Distinctions between worry, obsessions, and compulsions. *Behaviour Research & Therapy, 34,* 163–173.

Cooper, J. (1970). The Leyton Obsessional Inventory. *Psychological Medicine, 1,* 48–64.

Cottraux, J. (1989). Behavioural psychotherapy for obsessive–compulsive disorder. *International Review of Psychiatry, 1,* 227–234.

DeVeaugh-Geiss, J., Landau, P., & Katz, R. (1989). Treatment of obsessive–compulsive disorder with clomipramine. *Psychiatric Annals, 19,* 97–101.

First, M. B., Spitzer, R. L., Gibbon, M., & Williams, J. B. W. (1995). *Structured Clinical Interview for* DSM–IV-*Axis I Disorders (SCID–IP).* Washington, DC: American Psychiatric Press.

Foa, E. B., Kozak, M. J., Goodman, W. K., Hollander, E., Jenike, M. A., & Rasmussen, S. (1995). DSM–IV field trial: Obsessive–compulsive disorder. *American Journal of Psychiatry, 152,* 90–96.

Foa, E. B., Steketee, G., Grayson, J. B., Turner, R. M., & Latimer, P. R. (1984). Deliberate exposure and blocking of obsessive–compulsive rituals: Immediate and long-term effects. *Behavior Therapy, 15,* 450–472.

Freund, B., Steketee, G. S., & Foa, E. B. (1987). Compulsive Activity Checklist (CAC): Psychometric analysis with obsessive–compulsive disorder. *Behavioral Assessment, 9,* 67–79.

Goodman, W. K., Price, L. H., Rasmussen, S. A., Mazure, C., Fleischmann, R. L., Hill, C. L., Heninger, G. R., & Charney, D. S. (1989). The Yale–Brown Obsessive Compulsive Scale: I. Development, use, and reliability. *Archives of General Psychiatry, 46,* 1006–1011.

Hamilton, M. (1960). A rating scale for depression. *Journal of Neurology, Neurosurgery & Neuropsychiatry, 23,* 56–61.

Hodgson, R. J., & Rachman, S. (1977). Obsessional-compulsive complaints. *Behaviour Research & Therapy, 15,* 389–395.

Marks, I. M., Hallam, R. S., Connolly, J., & Philpott, R. (1977). *Nursing in behavioural psychotherapy.* London, United Kingdom: Royal College of Nursing.

Rachman, S., & DeSilva, P. (1978). Abnormal and normal obsessions. *Behaviour Research & Therapy, 16,* 233–248.

Rachman, S., & Hodgson, R. J. (1980). Obsessions and compulsions. Englewood Cliffs, NJ: Prentice Hall.

Sanavio, E. (1988). Obsessions and compulsions: The Padua Inventory. *Behaviour Research & Therapy, 26,* 169–177.

Spielberger, C. D. (1983). *Manual for the State–Trait Anxiety Inventory (Form Y).* Palo Alto, CA: Consulting Psychologists Press.

Spitzer, R. L., Williams, J. B., Gibbon, M., & First, M. B. (1990). *Structured Clinical Interview for* DSM–III–R—*Patient Edition.* Washington, DC: American Psychiatric Press.

Taylor, S. (1995). Assessment of obsessions and compulsions: Reliability, validity, and sensitivity to treatment effects. *Clinical Psychology Review, 15,* 261–296.

Received June 3, 1997
Revision received April 14, 1998
Accepted April 21, 1998 ■