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The Brown Incompleteness Scale (BINCS): Measure development and initial evaluation

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Abstract

Background—In recent years, incompleteness has received increased clinical attention as a core motivation underlying obsessive-compulsive spectrum disorders. Yet, assessment of incompleteness has relied almost exclusively on self-report and has assumed a unitary conceptualization of this phenomenon. Therefore, we sought to develop and validate a new multi-faceted clinician-administered measure of incompleteness. The Brown Incompleteness Scale (BINCS) consists of 21 items; each rated on a 5-point scale, with higher scores indicating a greater degree of incompleteness. The current study describes the measure's development and preliminary validation.

Methods—The scale was administered to 100 consecutive participants who were part of a longitudinal follow-up study of OCD. The reliability, validity, and factor analytic structure of the scale were evaluated.

Results—Exploratory factor analysis supported a two-factor solution, which can best be described as representing both behavioral and sensory manifestations of incompleteness.

Conclusions—The BINCS demonstrated strong internal consistency as well as convergent and divergent validity. This clinician-administered scale will provide a more comprehensive clinical assessment of patients with incompleteness.

Keywords

Obsessive compulsive disorder; Not just right; Sensory

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1. Introduction

In 1992, Rasmussen and Eisen proposed a conceptual model of the heterogeneity of obsessive-compulsive disorder (OCD) that delineated two core features, harm avoidance and incompleteness (Rasmussen & Eisen, 1992). They hypothesized that different symptom clusters, comorbid disorders, personality traits, and specific neural circuits would be differentially associated with these subtypes (Rasmussen & Eisen, 1992). While harm avoidance has been investigated in numerous studies of anxiety and obsessive-compulsive (OC) spectrum disorders (see Kampman, Viikki, Järventausta, & Leinonen, 2014 for review), only recently has the clinical importance of incompleteness received significant research attention (Pietrefesa & Coles, 2008; Summerfeldt, Kloosterman, Parker, Antony, & Swinson, 2001; Summers, Fitch, & Cougle, 2014; Taylor et al., 2014). It was Janet in 1904 who was the first to point out that individuals with OCD are tormented by an inner sense of imperfection (Janet, 1904). That is, they feel that the actions they perform are incompletely achieved or do not produce the sought for satisfaction. This is often coupled with an inability to achieve closure concerning actions (or perceptions related to actions) that lead to what has been termed “not just right experiences” (Pietrefesa & Coles, 2008). Janet described an often unrealized drive for perfection which, if on the rare occasion achieved, is accompanied by a “sublime feeling of ecstasy.” (Janet, 1904).

Clinical experience suggests that manifestations of incompleteness can range from procrastination and perfectionism with excessive attention to marked difficulty with planning and lost productivity leading to the inability to sustain goal directed behavior (Pallanti, Barnes, Pittenger, & Eisen, 2017; Rasmussen, Eisen, & Greenberg, 2013). Thus, it is not surprising that incompleteness is broadly associated with OC spectrum disorders including OCD (Sibrava, Boisseau, Eisen, Mancebo, & Rasmussen, 2016), body dysmorphic disorder (Summers, Matheny, & Cougle, 2017), and compulsive hoarding (Pertusa & Fonseca, 2014) and with characteristics such as perfectionism (Ecker, Kupfer, & Gönner, 2014), and sensory phenomena and tic-like experiences (Miguel et al., 2000). The clinical significance of incompleteness is also underscored by its associations with poor treatment outcome, increased comorbidity, and higher degrees of functional impairment (Sibrava et al., 2016).

Recognition of the clinical significance of incompleteness has brought about increased attention on how to define and reliably measure the construct (see Taylor et al., 2014). Some of the confusion has arisen out of the lack of clarity as to whether incompleteness is a sensory phenomenon, a motor urge or impulsion, a failure of sustained action, or a primary motivation or drive. Indeed, previous research has highlighted incompleteness as a multidimensional construct (Sibrava et al., 2016; Summers et al., 2014; Zor, Szechtman, Hermesh, Fineberg, & Eilam, 2011). Accordingly, we have proposed that incompleteness consists of three overlapping subdomains: (1) perfectionism, obsessive-compulsive personality traits, and “not just right” experiences (2) sensory concerns and tic-like experiences, and (3) problems with goal-directed behavior and prioritization (see Pallanti et al., 2017 for detailed discussion). Existing incompleteness scales capture one or more aspects of these putative subdomains. Therefore, development of a measure that goes beyond

assessing the presence of incompleteness as a unitary entity may be essential to advancing research and clinical exploration.

One of the most frequently utilized measures, the *Obsessive-Compulsive Trait Core Dimensions Questionnaire (OC-TCDQ)* (Summerfeldt et al., 2001), is a 20-item self-report scale with two factor analytically defined subscales—incompleteness and harm avoidance. Based on an established core dimensions model of OCD (Summerfeldt, Kloosterman, Antony, & Swinson, 2014), the OC-TCDQ's primary strength lies in its ability to: 1) identify the presence and frequency of incompleteness and harm avoidance phenomena, and 2) draw comparisons between the presence and frequency of incompleteness and harm avoidance to determine relative contribution of these non-orthogonal motivating features underlying heterogeneous OCD symptoms (Summerfeldt et al., 2014). Despite the strengths of the OC-TCDQ, however, several factors restrict its utility in comprehensively capturing incompleteness. Namely, the OC-TCDQ treats both harm avoidance and incompleteness as unitary constructs. As such, it does not readily allow for multifaceted investigation of incompleteness, which may limit its content validity and applicability to comprehensive investigations of this phenomenon.

Putative facets of incompleteness have also been studied using the well-validated *Not Just Right Experiences Questionnaire (NJRE-Q)* (Coles, Frost, Heimberg, & Rhéaume, 2003) which assesses respondents' subjective sensations of feeling “not just right” following a series of 10 hypothetical behavioral scenarios, as well as the *University of São Paulo Sensory Phenomena Scale (USP-SPS)* (Rosario et al., 2009), which was designed to assess tic-related phenomena and includes just two incompleteness-specific items. Both of these measures focus largely on sensory-related discomfort, however, and may not adequately capture the larger construct of incompleteness. Namely, perfectionism and the completion of tasks “perfectly” or “just right” has also been described as a component of incompleteness (Pietrefesa & Coles, 2008; Zor et al., 2011). Moreover, we posit that there are key aspects associated with incompleteness that are not effectively assessed with existing measures including: difficulties getting from point A to point B (i.e., prioritization), the inability to sustain goal-oriented behavior, and difficulties with decision-making under uncertain conditions (Pallanti et al., 2017; Rasmussen & Eisen, 1992). Thus, a clinical measure that comprehensively assesses these multiple facets of incompleteness may allow for more comprehensive assessment of the incompleteness phenomenon resulting in improved clinical utility.

Complementing these existing scales is a growing body of behavioral research investigating novel paradigms designed to elicit incompleteness experiences in laboratory settings (Cougle, Goetz, Fitch, & Hawkins, 2011; Fitch & Cougle, 2013; Pietrefesa & Coles, 2008; Summers et al., 2014, 2017). For example, Summers et al. (2017) used in vivo visual, auditory and tactile NJRE tasks aimed at evoking the sensations that things do not look, sound, or feel right and found strong correspondence between behavioral task ratings and self-reported ratings of incompleteness. Such research underscores the unique affective correlates of incompleteness experiences (Pietrefesa & Coles, 2008) and demonstrates the potential added benefit of in vivo NJRE assessment in predicting compulsive behavior (Cougle, Goetz, Fitch, & Hawkins, 2011). To date, examination of these paradigms has been

limited to undergraduate samples; future studies with well-characterized clinical populations are critical for generalization of study findings. Multi-method research could further be bolstered by the inclusion of a semi-structured clinical assessment of incompleteness.

Despite the development of novel behavioral paradigms, the assessment of incompleteness remains limited by the lack of a comprehensive clinical assessment tool. Indeed, to date there is only one clinician-rated measure of incompleteness. Developed by Summerfeldt and colleagues (2014), the *Obsessive Compulsive Core Dimensions Interview* (OC-CDI) utilizes information obtained from the *Yale Brown Obsessive Compulsive Scale and Symptom Checklist* (YBOCS; Goodman et al., 1989a, 1989b) and provides a Likert-type rating of the degree to which each individual item endorsed on the checklist is associated with incompleteness (and harm avoidance). Although useful in the characterization of OCD symptoms, the OC-CDI was noted by the authors to be time-consuming (Summerfeldt et al., 2014), and its dependence on a concurrently administered OCD-specific symptom measure does not facilitate examination of the construct of incompleteness as a transdiagnostic mechanism. Moreover, it is likely that clinician-assisted assessment may provide more accurate measurement of this construct, as self-reporting the motivation driving a symptom requires both insight and ability to articulate complex internal cognitive and affective processes. Therefore, the aim of the present investigation was to develop and validate an independent, clinically relevant measure of incompleteness—the Brown Incompleteness Scale (BINCS)—that leverages extant clinical literature and encompasses a range of relevant characteristics (e.g., perfectionism, sensory manifestations, and difficulties with goal directed behavior). We predicted that the BINCS would have a multidimensional factor structure and demonstrate strong reliability and convergent validity with criterion measures.

2. Method

2.1. Item and measure development

Items for the BINCS were generated collaboratively by a panel of experts in OCD (authors C.L.B., N.J.S., M.C.M., J.L.E., & S.A.R.) and OC-related disorders after reviewing clinical and research observations of the phenomenology of incompleteness (e.g., Rasmussen & Eisen, 1992; Summerfeldt et al., 2001) and measures of theoretically related constructs (e.g., “not just right experiences”; Coles et al., 2003) and sensory phenomena (Rosario et al., 2009). The resultant 59 items were edited by consensus to reduce item overlap and improve clarity and face validity. Feedback regarding the relevance and clarity of items was also obtained from several patients with OCD presenting to our outpatient clinic and through a focus group of participants clinically endorsing high levels of incompleteness. Following incorporation of this input, the final examined product was an interviewer-administered scale consisting of 25 target symptoms followed by three overall (past-week) severity ratings of time, distress, and interference. The BINCS, which in form is based off of the Yale-Brown Obsessive Compulsive Scale and Symptom Checklist (Goodman et al., 1989a, 1989b), first collects detailed information about the presence and frequency of incompleteness symptoms. The semi-structured assessment begins with a list of target symptoms (e.g., *it has to feel ‘just right’ in order to stop a routine activity*) each with specific examples designed to assist the rater in assessing the range of incompleteness experiences (e.g., *“having to wait until it feels*

right to stop brushing teeth”). Based on the information obtained, the frequency of each symptom is rated by the assessor using 5-point Likert-type scale from 1 (*never*) to 5 (*always*). Following symptom assessment, the rater assesses the overall impact of incompleteness in terms of time, distress, and interference in the past week. The semi-structured prompts and response options of these three items were based on the time, distress and interference items of the YBOCS severity scale with time occupied rated from 0 (*none*) to 4 (*very severe, greater than 8 h per day*), distress rated from 0 (*none*) to 4 (*extreme, near constant and disabling distress*) and interference rated from 0 (*none*) to 4 (*extreme, causes significant impairment in all major areas, incapacitating*). The administration time for the BINCS is approximately 20 minutes.

2.2. Participants and procedures

Participants in this study were recruited as part of large longitudinal study of OCD course. A detailed description of recruitment, study procedures, and interviewer training can be found elsewhere (Pinto, Mancebo, Eisen, Pagano, & Rasmussen, 2006). Briefly, the BLOCS cohort was recruited from consecutive admissions to one of several psychiatric treatment settings in the Rhode Island/Southeastern Massachusetts area including a hospital-based outpatient OCD clinic, inpatient and partial hospitalization units of a private psychiatric hospital, a general outpatient psychiatric group practice, two community mental health centers, and three private practice psychotherapy sites known for their expertise in providing treatment for OCD. Inclusion criteria for the BLOCS were: 1) a primary *DSM-IV* diagnosis of OCD (identified as the most problematic set of symptoms over the course of a participant’s lifetime), 2) seeking treatment for these symptoms in the last five years, and 3) ability to provide written informed consent. The only exclusion criterion was the presence of an organic mental disorder. Following the initial baseline assessment, participants were interviewed on an annual basis. The Brown University and Butler Hospital Institutional Review Boards approved the study.

For the purpose of this initial validation study, the BINCS was added to the study battery in 2013, 8 years after the start of the baseline assessment. All adult participants who received the BINCS are included in this report. The resulting sample of 100 participants was 51.5% female and 94.1% Caucasian with a mean age of 47.42 years ($SD = 15.27$). Mean YBOCS score at the time of BINCS administration was 15.45 ($SD = 9.27$).

2.3. Measures

In addition to the BINCS (described above), the following measures were administered in this study:

Yale-Brown Obsessive-Compulsive Scale and Symptom Checklist (YBOCS; Goodman et al., 1989a, 1989), a clinician-administered 10-item scale with specific probes and anchors, was used to assess severity of obsessions and compulsions. Prior to the YBOCS, raters administered the YBOCS Symptom Checklist to gather information on specific current symptoms. This scale, which has established reliability and validity, is widely accepted as the gold-standard outcome measure for OCD (Goodman et al., 1989a, 1989b).

Dimensional Obsessive Compulsive Scale (DOCS; Abramowitz et al., 2010), is a 20-item self-report severity assessment of four OCD dimensions: concerns about contamination and germs; concerns about being responsible for harm, injury or bad luck; unacceptable thoughts; concerns about symmetry, completeness and the need for things to be “just right” Internal consistency for the total score and each of the four subscale scores are excellent and test-retest reliability is adequate. (Abramowitz et al., 2010).

Obsessive Compulsive Trait-Core Dimensions Questionnaire (OC-TCDQ; Summerfeldt et al., 2001) is a 20-item self-report measure assessing two core dimensions of harm-avoidance (10 items) and incompleteness (10 items). The OC-TCDQ has demonstrated structural validity in both clinical and nonclinical samples (Summerfeldt et al., 2014) as well good convergent validity, demonstrating expected correlations with measures of OC symptoms and perfectionism (Summerfeldt, Antony, & Swinson, 2000).

Structured Clinical Interview for DSM-IV Axis II Personality Disorders (First, Gibbon, Spitzer, Williams, & Benjamin, 1997)- OCPD Module, is a semi-structured interview designed to assess OCPD. One or more questions assess each of the 8 criteria, which are then rated on a 3-point scale (1 not present; 2 present but clinically insignificant; 3 definitely present). The OCPD module has acceptable interrater reliability and internal consistency (Maffei et al., 1997, pp. 693).

Pathological Obsessive-Compulsive Personality Scale (POPS; Pinto, Ansell, & Wright, 2011) is a 49-item self-report measure of maladaptive obsessive-compulsive personality traits and severity. The scale provides a total score that represents obsessive compulsive personality pathology on a continuum of increasing severity and dysfunction as well as five specific trait factor subscales: rigidity, emotional overcontrol, maladaptive perfectionism, reluctance to delegate, and difficulty with change. The POPS has demonstrated excellent internal consistency reliability, as well as convergent and discriminant validity (Pinto et al., 2011; Wheaton & Pinto, in press).

Hoarding Rating Scale-Interview (HRS-I; Tolin, Frost, & Steketee, 2010) is a five item semi-structured interview assessment of compulsive hoarding. Interviewers rate severity of clutter, difficulty discarding, acquisition, distress, and impairment. Higher scores indicate greater severity of symptoms. The HRS-I has demonstrated high internal consistency and reliability across contexts. Criterion and convergent validity has been demonstrated as evidenced by the ability of the HRS-I to differentiate hoarding and non-hoarding individuals and strong associations with other measures of hoarding (Tolin et al., 2010).

Positive and Negative Affect Schedule (PANAS; Watson, Clark, & Tellegen, 1988) provides 10-item scores for positive and negative affect, respectively. Participants are asked to indicate the extent to which they feel each emotion on a regular basis. The positive and negative affect subscales have been shown to be highly internally consistent, largely uncorrelated with each other, and repeatedly been demonstrated to be reliable and valid (Watson et al., 1988).

2.4. Data analysis

For the exploratory factor analysis (EFA), parallel analysis was conducted to establish the maximum number of factors, with Eigen value > 1 (averaged over 1000 replications) required for a factor to be maintained. Following parallel analysis, oblique (oblimin) rotations were utilized as we expected dimensions of incompleteness to be correlated. Model goodness of fit was evaluated by the comparative fit index (CFI)/Tucker-Lewis index (TLI), the root mean-square error of approximation (RMSEA), and the standardized root-mean-square residual (SRMR). Acceptable fit was defined according to (Hu & Bentler, 1999): RMSEA values close to .06 or below, CFI and TLI values close to .95 or above, and SRMR values close to .08 or below. To assign items loading on specific factors, a traditional cut-off .30 was applied, with a minimum difference of .20 required for a loading to be considered independent (Tabachnick & Fidell, 2013). In addition to model fit indices, internal consistency of the BINCS was assessed using Cronbach's alpha and Pearson's correlations were conducted to examine the relationship between the BINCS and measures of psychopathology.

2.5. Results

Analyses were conducted using SPSS version 22 (IBM Corp., Released 2013) and Mplus version 6 (Muthén & Muthén, 2011). Kaiser-Meyer-Olkin ($KMO = .912$) and Bartlett's Test of Sphericity ($\chi^2 = 1769.34, p < .0001$) indicated that the data were suitable for factor analysis. Parallel analysis indicated a maximum of two factors, with eigenvalues for those factors greater than the eigenvalue at the 95th percentile of eigenvalues produced by random data. However, because the average eigenvalue over 1000 replications from the first factor (12.34) was much greater than the eigenvalue of the second factor (1.58) we conducted EFA examining both one and two factor solutions. The one-factor model provided acceptable fit $\chi^2 = 498.91, p < .001$, RMSEA = .09, CFI/TFI = .95/.95, SRMR = .08. According to the fit-indices the two-factor model was a substantial improvement over the one-factor model ($\chi^2 = 354.10, p < .001$, RMSEA = .06, CFI/TFI = .98/.98, SRMR = .06), and thus was selected as the best fit for the data. Inspecting the pattern matrix for the two-factor solution, 4 items (BINCS13, BINCS16 and BINCS17, and BINCS25) were determined to be non-independent based on cross-loadings .20 (see Table 1); these items were removed resulting in a final scale of 21 items. The first factor (Task Completion; 13-items) represents a behavioral manifestation of incompleteness is characterized by difficulty initiating and completing tasks due to needing to have things *be* perfect or just right. The second factor (Sensory; 8-items) represents a sensory manifestation of incompleteness and is characterized by a need to have things *feel* a certain way. The two BINCS subscales were moderately correlated ($r = .65$). Internal consistency for these two subscales was good to excellent (Cronbach's $\alpha = .95$ and .86 respectively). Mean ratings for past-week time, interference and distress were 1.44 ($SD = .99$), 1.19 ($SD = .86$), and 1.13 ($SD = 1.04$) respectively, reflecting mild to moderate levels symptoms, interference, and distress.

As summarized in Table 2, there were strong and positive correlations between the BINCS subscales and the incompleteness subscales of the OC-TCDQ and the DOCS, suggesting good convergent validity of the proposed measure and positive associations with existing measures of incompleteness. In addition and as expected, BINCS subscales demonstrated

significant positive correlations with OCD severity as well as small positive correlations with DOCS responsibility for harm, contamination and unacceptable thoughts subscales. For the subset of individuals who endorsed any compulsive hoarding ($n = 27$), a significant association was found between HRS-I total score and the BINCS Task Completion subscale ($r = .45$, $p = .012$) but not with the Sensory subscale ($r = .05$, $p = .80$). Individuals with OCPD had significantly higher BINCS total scores ($M = 61.91$, $SD = 13.88$) compared to those without OCPD ($M = 41.45$, $SD = 15.66$), $t(90) = 5.896$, $p < .0001$. This result was mirrored in both Task Completion, $t(98) = 7.335$, $p < .0001$, and Sensory, $t(98) = 2.481$, $p < .05$ subscales. Relatedly, performance on both BINCS subscales was significantly positively correlated with POPS subscales. In terms of divergent validity, the BINCS was not significantly associated with the general experience of positive or negative affect on the PANAS (see Table 2). Table 3 presents the associations between past-week BINCS ratings of time occupied, distress and interference and measures of convergent and divergent validity. As expected, all three rating were strongly positively correlated with past-week OCD symptom severity (YBOCS) as well as self-reported incompleteness on the OC-TCDQ and DOCS. Time occupied and interference on the BINCS were significantly correlated with OC-TCDQ harm avoidance ($ps > .05$), whereas BINCS distress was not; all correlations were small in magnitude ($rs = .19-.24$). These three items were also significantly positively correlated with POPS subscales and not significantly correlated with the general experience of positive or negative affect on the PANAS (see Table 3).

3. Discussion

To our knowledge, this is the first study to investigate a stand-alone clinician-rated measure of incompleteness. Our primary goal in developing the BINCS was to create a measure that would allow for the assessment of a more complex, multidimensional picture of this phenomenon and its impact on individuals who endorse these symptoms. This includes capturing both behavioral and sensory manifestations of incompleteness, as well as going beyond previous scales by assessing distress and functional impact. Results from the exploratory factor analysis suggested a two-factor structure, mapping on to both behavioral (i.e., difficulties with completing a task or action) and sensory (i.e., sensory-related discomfort that things do not *feel or look* right) aspects of incompleteness. Items on the task completion subscale encompass difficulty with initiating and completing tasks including related difficulties with prioritization and perfectionism. Consistent with behavioral research on incompleteness (Summers et al., 2014, 2017) the sensory subscale taps phenomena across multiple sensory modalities.

Importantly, the results of this study support the structural, convergent, and divergent validity of the BINCS. As expected, both BINCS subscales and past-week functional impact (e.g., severity, distress and interference) demonstrated strong positive correlations with well-established self-report measures of incompleteness. In addition, the BINCS demonstrated strong positive correlation with the maladaptive perfectionism subscale of the POPS as well as other trait markers for OCPD. OCD participants with OCPD also demonstrated significantly higher scores on the BINCS than those without such comorbidity. Collectively, these findings are consistent with extant research highlighting the role of obsessive-compulsive personality traits in incompleteness (Ecker et al., 2014). Neither the BINCS

subscale nor BINCS past-week functional impact were significantly correlated with general experiences of positive or negative affect. Negative affect and related concepts (e.g., neuroticism) have long been implicated as higher order constructs with strong influence over the pathogenesis of emotional disorders (Brown, Chorpita, & Barlow, 1998). The non-significant findings here lend credence to the notion that factors beyond neuroticism, such as incompleteness, are important to the understanding the etiology and maintenance of OCD and related disorders. Nevertheless, it will be important for future research to operationalize the relationship of this specific core dimension relative to broader higher-order dimension of negative affectivity.

Low-moderate correlations with the harm avoidance subscale of the OC-TCDQ is consistent with prior investigations highlighting the frequent co-occurrence and overlap between harm avoidance and incompleteness dimensions (Ecker & Gönner, 2008; Summerfeldt et al., 2014). Underlying motivation can vary across OCD symptom types. For example, the same washing compulsion can be motivated by incompleteness (e.g., a need to have hands perfectly clean) and/or harm avoidance (e.g., getting rid of germs thought to cause illness). Results from the DOCS support this notion. Low-moderate positive correlations were found between the DOCS contamination, responsibility for harm, and unacceptable thoughts subscales and the BINCS. Findings on the hoarding rating scale also merits discussion. Interestingly, only the task completion subscale was significantly correlated with hoarding. This result is consistent with research outlining highlight vast executive functioning difficulties in hoarding (Morein-Zamir et al., 2014). This finding leads to the intriguing possibility that incompleteness in hoarding, unlike other OC spectrum disorders, is limited to this particular behavioral domain. Future research using in vivo paradigms focused on sensory incompleteness could shed additional light on this notion.

With respect to the potential clinical utility of a more complex assessment of incompleteness, the two factors identified with the BINCS may provide important guidance for individualized treatment planning and measurement of treatment progress in patients struggling with different facets of incompleteness. Employing the BINCS as part of a comprehensive clinical assessment may help guide clinicians to focus on the relevant sensory-affective and/or cognitive dimensions for each patient and lead to more targeted interventions and evaluation of symptom change. Patients with sensory-related incompleteness symptoms may show specific benefit from repeated exposure to tasks that provoke discomfort and the urge to counteract sensory-specific stimuli (e.g., wearing clothes that do not hang or texturally feel right). Approaches that combine situational and interoceptive exposure (Boisseau, Farchione, Fairholme, Ellard, & Barlow, 2010) may be of particular utility in addressing the internal feelings of discomfort that characterize this population (Blakey & Abramowitz, in press). It would also be worthwhile to examine whether supplementing traditional exposure-based approaches with techniques used to address perfectionism-associated task *incompletion* in OCPD (Pinto, 2016) improves treatment outcome for individuals with high levels of behavioral incompleteness.

Limitations of the investigation warrant consideration. Our sample size was relatively modest for factor analysis. Though some simulation studies suggest that sample sizes like ours can provide good recovery of population factors (c.f., MacCallum, Widaman, Zhang, &

Hong, 1999), replication with larger, more diverse samples is needed to confirm our results. Moreover, while we were able to capitalize on our existing well-characterized cohort of BLOCS study participants, this approach precluded us from investigating the relationship between the BINCS and other measures of interest. Examining associations between the BINCS, self-report measures such as the NJRE-Q, and in vivo incompleteness paradigms remains an important area for future investigation. In addition, study participants were predominantly Caucasian and all were treatment seeking. Thus, it is unclear how our results generalize to more diverse or non-treatment-seeking individuals in the community. This too is an important area for future investigation. Finally, inter-rater and test retest reliability of the BINCS were not assessed in this sample. These additional psychometrics could provide further support for the utility of the BINCS. Despite these limitations, the study has several strengths including the utilization of a well-characterized sample of OCD participants and the use of well-validated measures of convergent and discriminate validity.

In summary, the BINCS is a brief, clinician-rated measure of the behavioral and sensory-affective underpinnings of incompleteness. In this preliminary investigation, it demonstrated solid psychometric properties including good convergent and discriminant validity. Further research should replicate and extend the findings reported here using a larger, transdiagnostic population of individuals with OC spectrum disorders. Given research highlighting the growing need to move away from diagnosis-based approaches toward dimensional endophenotypes, it is critical we have tools to reliably and validly quantify core clinical features such as incompleteness. Use of this scale may advance our ability to provide a comprehensive clinical assessment of incompleteness.

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Table 1

Comparison of one-factor vs. two factor solutions.

<i>BINCS Item</i>	Two factor		One Factor
	Factor 1	Factor 2	Factor 1
8	1.019	-.185	.849
7	.928	-.157	.780
6	.837	.071	.871
3	.818	-.142	.671
9	.813	.093	.863
2	.793	-.045	.727
5	.748	.166	.857
4	.718	.231	.881
20	.708	.181	.830
15	.691	.202	.828
1	.644	.292	.868
10	.595	.146	.690
18	.541	.239	.730
16	.509	.350	.775
13	.448	.428	.785
25	.427	.430	.764
24	-.025	.850	.710
19	-.064	.801	.631
14	.060	.780	.731
22	-.043	.713	.570
21	.015	.684	.610
12	.170	.661	.724
23	.143	.592	.645
11	.315	.534	.748
17	.339	.484	.715

Note: BINCS=Brown Incompleteness Scale. Items 13, 16, 17 and 25 were determined to be non-independent based on cross-loadings .20.

Table 2

Bivariate correlations between BINCS factors and measures of convergent and divergent validity (n = 89).

	BINCS Behavioral	BINCS Sensory
YBOCS Severity	.593 **	.451 **
DOCS		
Contamination	.335 **	.469 ***
Responsibility for Harm	.296 **	.473 ***
Unacceptable Thoughts	.331 **	.373 ***
Completeness	.583 ***	.627 ***
OC-TCDQ		
Harm Avoidance	.309 **	.474 **
Incompleteness	.701 ***	.651 ***
POPS		
Rigidity	.399 ***	.322 **
Emotional Overcontrol	.343 **	.190
Maladaptive Perfectionism	.689 ***	.409 ***
Reluctance to Delegate	.560 ***	.424 ***
Difficulty with Change	.449 ***	.331 **
HRS-I ^a	.447 *	.051
PANAS		
Positive Affect	-.122	.010
Negative Affect	.121	.209

Note: YBOCS= Yale Brown Obsessive Compulsive Scale; DOCS = Dimensional Obsessive Compulsive Scale; OC-TCDQ = Obsessive Compulsive Core Dimensions Questionnaire; POPS = Pathological Obsessive Compulsive Personality Scale; HRS-I = Hoarding Rating Scale-Interview; PANAS = Positive and Negative Affect Schedule.

^aSubset that endorsed any compulsive hoarding (n = 27).

*
p < .05.

**
p < .01.

p < .001.

Table 3

Bivariate correlations between BINCS severity ratings and measures of convergent and divergent validity (n = 89).

	BINCS Time	BINCS Distress	BINCS Interference
YBOCS Severity	.673 **	.618 **	.688 **
DOCS			
Contamination	.373 **	.275 *	.329 **
Responsibility for Harm	.355 **	.274 *	.369 ***
Unacceptable Thoughts	.307 **	.293 **	.296 **
Completeness	.469 ***	.470 ***	.556 ***
OC-TCDQ			
Harm Avoidance	.244 *	.189	.233 *
Incompleteness	.548 ***	.570 ***	.657 ***
POPS			
Rigidity	.254 *	.236 *	.360 ***
Emotional Overcontrol	.222 *	.253 *	.343 **
Maladaptive Perfectionism	.561 ***	.562 ***	.665 ***
Reluctance to Delegate	.465 ***	.479 ***	.540 ***
Difficulty with Change	.337 **	.328 **	.401 ***
HRS-I ^a	.479 *	.606 **	.575 **
PANAS			
Positive Affect	-.018	-.107	-.149
Negative Affect	.173	.169	.093

Note: YBOCS= Yale Brown Obsessive Compulsive Scale; DOCS = Dimensional Obsessive Compulsive Scale; OC-TCDQ = Obsessive Compulsive Core Dimensions Questionnaire; POPS = Pathological Obsessive Compulsive Personality Scale; HRS-I = Hoarding Rating Scale-Interview; PANAS = Positive and Negative Affect Schedule.

^aSubset that endorsed any compulsive hoarding (n = 27).

*
p < .05.

**
p < .01.

p < .001.