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ORIGINAL ARTICLE

Parents' Perceptions of Internalizing and Externalizing Features in Childhood OCD

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Abstract

Although obsessive–compulsive disorder (OCD) has often been characterized as an internalizing disorder, some children with OCD exhibit externalizing behaviors that are specific to their OCD. This study sought to demonstrate that parents perceive both internalizing and externalizing behaviors in childhood OCD by examining the factor structure of the Child Obsessive–Compulsive Externalizing/Internalizing Scale (COCEIS), a parent-report questionnaire intended to measure these constructs. This study also investigated clinical correlates of internalizing and externalizing factors in the COCEIS. A factor analysis of questionnaire responses from 122 parents of youth with OCD revealed both externalizing and internalizing factors in the COCEIS. Externalizing behaviors in childhood OCD were associated with other, co-occurring externalizing behavior problems, while both factors were positively correlated with OCD severity and co-occurring internalizing symptoms. They were positively associated with each other at a trend level, and neither showed a significant relationship with insight. Sixty-two percent of parents endorsed "often" or "always" to at least one externalizing item, though modal responses to items suggested that each individual feature captured by the COCEIS may be relatively uncommon. Mean responses were significantly greater for internalizing items. This study provides evidence for distinct but related externalizing and internalizing behaviors specific to childhood OCD. Treatment for children with OCD presenting with more externalizing behaviors may require a greater emphasis on behavioral parent training and motivational enhancement.

Keywords Obsessive–compulsive disorder · Insight · Assessment · Disruptive behavior · Pediatric

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Introduction

Childhood obsessive–compulsive disorder (OCD) has been traditionally characterized as an internalizing condition, in which children experience intrusive thoughts as distressing and feel compelled to engage in unwanted compulsions [1–3]. Recent studies of childhood OCD, however, have shown that many children have a presentation that is characterized by more coercive and disruptive behaviors: children often impose their compulsions on others, demand that their parents accommodate symptoms, and can have rage attacks when obsessions are elicited [4–6]. The goal of this study is to provide further evidence for an externalizing presentation of childhood OCD, and determine how it may be related to and distinguished from more internalizing experiences in OCD.

The concepts of internalizing and externalizing disorders have proven to be empirically supported and clinically useful constructs in the nosology of childhood psychopathology [2, 3, 7, 8]. Internalizing disorders involve experiences that are intrinsically upsetting to children, and often cause them to avoid or withdraw (e.g., depressive and anxiety disorders), while externalizing disorders are characterized by behaviors that are more typically problematic to others (e.g., disruptive behavior disorders, attention-deficit/hyperactivity disorder) [7, 8].

Obsessive–compulsive disorder has often been categorized as an internalizing disorder [1–3]. Recent evidence, however, has elucidated the prevalence of coercive and disruptive behaviors that are specific to OCD, in that they occur far less often in children with disruptive behavior disorders without OCD (e.g., imposing strict rules on cleanliness or forbidding the use of objects in his/her vicinity) [4, 5]. Children with OCD sometimes appear to experience obsessions as ego-syntonic, as they may make demands that their parents provide excessive reassurance or assist with compulsions, and can become irritable, angry, or even aggressive when they are not accommodated [4–6]. One study found that two-thirds of parents report that some type of OCD-specific coercive or disruptive behavior occurs frequently, and another study found that over half of parents of children with OCD reported that their children had rage attacks in the previous month [5, 6]. These disruptive behaviors involving parents are clinically important phenomena, as they have been found to be related to both increased OCD severity and family accommodation [5].

Studies investigating the clinical characteristics of children with OCD and disruptive behavior problems have yielded mixed findings. For example, one study found that poor insight was related to co-occurring externalizing behavior problems among children with OCD, as children may be more defiant and/or demanding about OCD-related issues (e.g., completing rituals) if they perceive their obsessions and/or compulsions to be reasonable [9]. Thus, children with externalizing expressions of OCD may appear to enjoy engaging in compulsions that bother other family members. Two earlier studies, however, did not find insight to be a significant predictor of disruptive behavior problems [10, 11]. Children with comorbid OCD and disruptive behavior disorders may also be at risk for more internalizing symptoms as well, though current findings are also mixed [12, 13]. In one survey of parents of children with OCD, coercive and disruptive behaviors specific to OCD were associated with OCD severity and anxiety symptoms, but not depressive symptoms [5], while another study found that temper outbursts among children with OCD were associated with depressive symptoms but not OCD severity [14].

The first goal of this study was to evaluate the factor structure of a parent-report questionnaire, the Child Obsessive–Compulsive Externalizing/Internalizing Scale (COCEIS), which was intended to capture both internalizing and externalizing experiences in childhood OCD. This study intends to build on the work of Lebowitz and colleagues [4, 5] by evaluating internalizing as well as externalizing reactions to OCD. Including an OCD-specific assessment of internalizing and externalizing behaviors has the potential to better understand issues specific to this diagnostic group and may relate more strongly to OCD-relevant variables than broader measures, such as the Child Behavior Checklist [7]. Internalizing and externalizing dimensions were expected to be positively related to each other, as they were both hypothesized to be positively associated with OCD severity: children with more severe OCD were predicted to have symptoms that are reported to be more upsetting (internalizing), but also to be more argumentative, irritable, and oppositional in the context of their OCD (externalizing).

The second goal was to evaluate whether there are clinical correlates of externalizing and internalizing dimensions in childhood OCD. Externalizing behaviors in OCD were expected to be positively related to co-occurring externalizing behavior problems, while internalizing symptoms in OCD were expected to be positively related to co-occurring internalizing symptoms. These phenomena were also expected to be related to insight into the excessiveness of symptoms in opposite directions, with internalizing obsessive–compulsive symptoms related to better insight, and externalizing obsessive–compulsive behaviors related to poorer insight, as children with more awareness of the excessiveness of obsessions and compulsions may experience symptoms as more intrinsically upsetting, while children with poorer insight may be likely to act defiantly if symptoms are not accommodated.

Methods

Participants and Procedures

Participants were 122 parent–child dyads (children ages 7–18) with a diagnosis of OCD and/or a score on the Children's Yale-Brown Obsessive Compulsive Scale (CY-BOCS) of at least 16, indicating at least moderately severe OCD [15]. Child-parent dyads were enrolled in a series of four clinical studies at a University-based OCD clinic between 2004 and 2016 and were given a variety of questionnaires, including the Child Obsessive–Compulsive Externalizing/Internalizing Scale (COCEIS).

We first conducted exploratory analyses to determine whether there were differences between samples on any of the variables measured in this study. Significant differences between studies were found in age, $F(3, 121) = 3.00$, $p = .034$; mean CY-BOCS, $F(3, 118) = 6.38$, $p = .001$; and the internalizing subscale of the COCEIS (COCEIS-I, described later); $F(3, 118) = 4.92$, $p = .003$. Compared to the first study, the mean age in the most recent study was 1.5 years older, representing a significant difference, $p = .008$. The mean CY-BOCS score was 4.22 points greater in the most recent study than it was in the first study, $p = .012$, and mean scores on the internalizing subscale of the COCEIS-I was lower in the first study than it was in any of the later three, p range $= 0.002 - 0.02$. The discrepancy in OCD severity between the studies likely reflects different inclusion criteria for the first study, which did not require a minimum CY-BOCS score of 16, and thus included children with less severe OCD. Regardless, Levene's test for homogeneity of variance did not suggest unequal variances across samples for the COCEIS-E, $F(3, 118) = 1.08$, $p = .36$, or for the COCEIS-I, $F(3, 118) = 0.12$, $p = .95$. The first two studies were cross-sectional and the two more recent studies were observational studies of treatment outcome. Children and parents completed a set of questionnaires before beginning cognitive-behavioral therapy at the clinic. All studies were approved by the University institutional review board. Informed consent and assent was obtained from all parents and children included in the study.

Measures

Demographics

Parents completed a demographic survey about their children assessing information including race, sex, and age.

Child Obsessive–Compulsive Externalizing/Internalizing Scale (COCEIS)

Twenty-five items were originally created by the last two authors to capture OCD-related disturbance during childhood across domains, including functional impairment and family accommodation, as well as ego-syntonic, ego-dystonic, internalizing, and externalizing expressions of OCD. Youth in the study all held an OCD diagnosis, and thus wording in the items about behaviors being related to OCD occurred within the context of consent to be included in a study about OCD as well as psychoeducation about their diagnosis and treatment. Items were scored on a 1–4 Likert Scale, with 1 representing "Never," 2 "Sometimes," 3 "Often," and 4 "Always." The goal of this study was to evaluate internalizing and externalizing reactions to obsessions and compulsions, and thus this paper assessed specific items that were hypothesized to distinguish internalizing and externalizing presentations. Following the work of others who have introduced parent-report assessments of OCD-related impairment in childhood and family accommodation [16, 17], the present study used an assessment of externalizing and internalizing presentations that are specific to this diagnostic group.

To accomplish this goal, the first and second authors independently reviewed the original 25 items from the scale, and based on face-validity consensus between both raters, selected 15 items that were hypothesized to relate to internalizing and externalizing behaviors in childhood OCD, generating the first version of the COCEIS. These items were subjected to a factor analysis, with a psychometric evaluation of the best-fitting solution to follow. The full COCEIS can be found in the Appendix.

Children's Yale-Brown Obsessive–Compulsive Scale (CY-BOCS)

The CY-BOCS is an interviewer-rated scale of obsessive–compulsive severity that has demonstrated solid psychometric properties [15, 18, 19]. The total score on the CY-BOCS is calculated by summing 10 items that assess OCD severity across domains on a 0–4 Likert scale, including distress, time, impairment, resistance, and control. There was good internal consistency for the CY-BOCS in the present sample, at $\alpha = 0.85$.

The CY-BOCS includes several supplemental items, including an item assessing insight rated on a 0–4 Likert scale, with higher scores indicating poorer insight. The clinician-rated item is based on children's responses to the following questions (with parents present): "Do you think your concerns or behaviors are reasonable?" If more information is needed, clinicians can follow up the following prompts: "What do you think would happen if you did not perform the compulsion(s)?," and "Are you convinced something would really happen?" This item is scored from 0 to 4, with higher scores indicating poorer insight. The CY-BOCS insight item has been used to assess insight in childhood OCD and has been related to other clinical variables in previous studies [9, 10].

The Child Behavior Checklist (CBCL)

The CBCL is a 113-question parent-report measure which assesses behavioral and emotional problems in childhood and has strong psychometric properties [7]. The CBCL provides age- and gender-normed T-scores for subscales assessing internalizing and externalizing symptoms, which were used in this study. There was strong internal consistency for each subscale in the present sample ($\alpha = 0.84$).

Analytic Plan

An exploratory factor analysis (EFA) was performed to examine the factor structure of the COCEIS. To allow for general factor variation, an EFA using a promax rotation and a principal axis factoring extraction method was conducted. Factor retention criteria were determined with a parallel analysis as described by Hayton, Allen, and Scarpello (2004) [20]. Fifty random datasets with an identical number of participants and range of responses on items were generated. The 95th percentile eigenvalue among the random datasets was then extracted. The number of factors was determined by comparing the eigenvalues of the actual data with the 95th percentile eigenvalues in the random datasets, retaining only those that were greater in the actual dataset. Items were required to have loadings above 0.40 on one factor and a difference of at least 0.20 between loadings to in order to be retained [21]. Because of the importance of sample size in generating reliable factors in EFA, we combined the samples when conducting the factor analysis, as opposed to conducting analyses with each sample independently and subsequently pooling them, as was done in other analyses.

Items from each factor were then summed to create subscale scores. Cronbach's alpha coefficients for each subscale were then computed to estimate internal consistency. An item-level analysis was conducted to provide an estimate of the frequency of externalizing behaviors specific to childhood OCD. We also conducted a t-test in order to compare the average rating of externalizing items with internalizing items for each sample. After the standardized mean difference was derived from each sample, pooled effects across samples were then generated using the "metafor" package in R [22]. Participants from "Study 2" were excluded from pooled analyses due to the low number of participants in this sample ($n = 6$). The distribution of responses to each subscale for each sample, as well as the distribution of responses to the full sample, was also evaluated.

Pearson correlations were conducted between each COCEIS subscale and the following clinical and demographic variables: CY-BOCS, CBCL-Internalizing and Externalizing subscales, the C-YBOCS Insight item, and age. They were also correlated with each other. The pooled correlation coefficient across samples was then computed. Heterogeneity of correlations across samples were first computed using Q coefficients to determine if pooling the samples would generate reliable results. Estimation-maximization was used to impute missing items from questionnaires, as less than 5% of data were missing. For correlation analyses, pairwise deletion was used, and thus sample sizes varied slightly from analysis to analysis. Cohen's (1988) effect size conventions were used to describe the magnitude of effects (small: $r \geq 0.1$; medium: $r \geq .3$; large: $r \geq 0.5$) [23].

Results

Demographics

Demographically, youth in this study reported to be predominately non-Hispanic white (92%), with a slight majority of boys (54%). Average age was 12.3 years-old and average CY-BOCS was 23.4, indicating moderately severe OCD [19]. Demographic characteristics are shown in Table 1.

Factor Structure of COCEIS

Using the 15-item COCEIS, an initial two-factor solution was identified per the parallel analysis. Four items did not reach the 0.4 loading criterion ("My child's OCD is most intense when a family member is present," "I am more bothered by my child's symptoms than he/she is," "Do you think your child would be relieved if his/her OCD were cured?," and "My child is not upset by his/her OCD"). Another parallel analysis was therefore conducted to include 11 instead of 15 items. The 11-item parallel analysis suggested that the 95th percentile of eigenvalues generated by the fifty random datasets were 1.60, 1.45, and 1.31, while the eigenvalues of the actual data for the 11-item solution were 3.63, 2.10, and 1.08. Thus, a two-factor solution to the eleven-item COCEIS was retained, as the third eigenvalue was less than the 95th percentile third eigenvalue generated by the random datasets. To optimize reliability, an item analysis was conducted on each factor to determine whether the elimination of a single item would improve Cronbach's α for that factor [24]. This procedure did not suggest the removal of any items.

The final eleven-item, two-factor solution demonstrated a Kaiser–Meyer–Olkin measure of sampling adequacy of 0.74 and a significant Bartlett's Test of Sphericity, $\chi^2 = 439.16$, $p < .001$, suggesting adequate factor structure. It accounted for 43% of the variance, with the externalizing factor explaining 28% and the internalizing factor explaining 14%. Item descriptions and their loadings are summarized in Table 2.

Factor one included seven items labeled "externalizing" (COCEIS-E). Items from this subscale describe child behaviors that are characterized by oppositionality

Table 1 Demographics

	Total sample	Study 1	Study 2 [b]	Study 3	Study 4
Characteristic	N (%)	N (%)	N (%)	N (%)	N (%)
Male sex	66 (54)	31 (62)	4 (67)	15 (50)	16 (44)
Age M (SD)	12.2 (2.7)	11.4 (2.4)	12.8 (3.3)	12.7 (2.4)	12.9 (2.6)
Baseline CY-BOCS M (SD)	23.4 (6.9)	20.6 (7.7)	23.5 (2.3)	25.3 (6.5)	25.0 (5.3)
Race/ethnicity					
Non-Hispanic white	112 (92)	46 (92)	4 (67)	30 (100)	32 (89)
Asian	2 (2)	0	0 (0)	0 (0)	2 (6)
White Hispanic	1 (1)	1 (2)	0 (0)	0 (0)	0 (0)
Other/Multiracial	5 (4)	1 (2)	2 (33)	0 (0)	2 (6)
Comorbid diagnosis					
Anxiety disorder	30 (25)	9 (18)	0 (0)	14 (47)	7 (19)
Tic disorder	29 (24)	26 (52)	0 (0)	0 (0)	3 (8)
Attention-deficit/hyperactivity disorders	23 (19)	16 (32)	0 (0)	3 (10)	4 (11)
Depressive disorder	23 (19)	8 (16)	0 (0)	3 (10)	12 (33)
Oppositional defiant disorder	9 (7)	3 (6)	0 (0)	3 (10)	3 (8)
Autism spectrum disorder[a]	3 (2)	2 (4)	0 (0)	1 (3)	0 (0)
Trichotillomania	2 (2)	1 (2)	0 (0)	1 (3)	0 (0)
Eating disorder	1 (< 1)	0 (0)	0 (0)	0 (0)	1 (3)
Bipolar disorder	1 (< 1)	1 (2)	0 (0)	0 (0)	0 (0)
Enuresis	1 (< 1)	0 (0)	0 (0)	0 (0)	1 (3)

CY-BOCS Children's Yale-Brown Obsessive–Compulsive Disorder

[a]This diagnosis included what was formally classified as Asperger's Disorder

[b]Comorbidity data unavailable for this sample

Table 2 Item loadings for externalizing and internalizing factors of the Child Obsessive–Compulsive Externalizing/Internalizing Scale (COCEIS)

		Externalizing	Internalizing
Factor I: externalizing			
1	My child gets upset when his/her OCD symptoms are interrupted or prevented	**0.69**	0.07
2	My child argues with me about OCD related issues	**0.62**	0.08
3	My child cries and is often irritable because of their OCD	**0.61**	0.27
4	There is an oppositional quality to my child's OCD	**0.61**	−0.09
5	My child seems to enjoy OCD symptoms that bother me and other family members	**0.53**	−0.28
6	My child enjoys engaging in repetitive ritualistic behaviors	**0.51**	−0.15
7	My child gets out of chores and other responsibilities because of his/her OCD	**0.47**	0.15
Factor II: internalizing			
8	My child asks me for help when dealing with his/her OCD	−0.29	**0.88**
9	My child seems bothered about having OCD	0.02	**0.78**
10	My child is embarrassed about having OCD	0.28	**0.55**
11	My child has intensive distressing ideas or thoughts	−0.01	**0.53**

Bold font indicates that factors loaded onto the same factor

and defiance (e.g, "My child argues with me about OCD related issues"), and a perception that OCD symptoms are intrinsically reinforcing (e.g., "My child seems to enjoy OCD symptoms that bother me and other family members"). Factor two included four items and was labeled "internalizing" (COCEIS-I). Items from this subscale describe distress from obsessions and compulsions that are directed inward (e.g., "My child asks me for help when

Table 3 Summary of item responses on the Child Obsessive–Compulsive Externalizing/Internalizing Scale

	Never n (%)	Sometimes n (%)	Often n (%)	Always n (%)
Externalizing items				
My child gets upset when his/her OCD symptoms are interrupted or prevented	23 (19)	49 (40)	27 (22)	23 (9)
My child argues with me about OCD related issues	25 (21)	51 (47)	29 (24)	11 (9)
My child cries and is often irritable because of their OCD	34 (28)	54 (44)	29 (24)	5 (4)
There is an oppositional quality to my child's OCD	64 (53)	35 (29)	19 (16)	4 (3)
My child seems to enjoy OCD symptoms that bother me and other family members	101 (83)	16 (3)	5 (4)	0 (0)
My child enjoys engaging in repetitive ritualistic behaviors	64 (53)	35 (29)	19 (16)	4 (3)
My child gets out of chores and other responsibilities because of his/her OCD	51 (42)	48 (39)	16 (13)	7 (6)
Internalizing items				
My child seems bothered about having OCD	8 (7)	51 (42)	33 (27)	30 (25)
My child asks me for help when dealing with his/her OCD	33 (27)	40 (33)	35 (29)	14 (12)
My child is embarrassed about having OCD	19 (15)	53 (43)	30 (25)	20 (16)
My child has intensive distressing ideas or thoughts	25 (21)	51 (42)	35 (29)	11 (9)

dealing with his/her OCD," "My child is embarrassed about having OCD").[1]

Internal Consistency

Both subscales demonstrated acceptable internal consistency, COCEIS-E (externalizing): $\alpha = 0.78$, and COCEIS-I (internalizing): $\alpha = 0.77$. Internal consistency for the full measure was also acceptable, $\alpha = 0.78$.

Distribution of the Subscales

The COCEIS-E and COCEIS-I were found to be normally distributed in each sample, using cutoffs of -2 to +2 for skewness and −7 to +7 for kurtosis [25]. All samples showed a slightly positive skewness for the COCEIS-E that fell within the acceptable range for parametric analyses, with a value of 0.91 for the full sample. The COCEIS-I also showed slight positive skewness that fell in the acceptable range for all but the fourth sample, which was slightly negatively skewed, with a skewness value of 0.24 for the full sample. As noted in the "Participants and procedures" section, significant heterogeneity of variance was not observed across samples for either subscale. Thus, the COCEIS-I and COCEIS-E both appear appropriate for the parametric analyses presented below.

Item-Level Analysis

Sixty-two percent of parents ($n = 76$) responded "Often" or "Always" to at least one of the externalizing items. A summary of responses to each item on the COCEIS-E is shown in Table 3.

[1] The same factor structure was retained when using an orthogonal (i.e., uncorrelated) rather than oblique rotation.

The median response to items on the COCEIS-I was 2.41 ($SD = 0.72$; between Likert descriptions of "sometimes" and "often"), while the mean response to items on the COCEIS-E was 1.91 ($SD = 0.55$; below the Likert description "sometimes"). The modal response for all the items on the COCEIS-I and three of the items on the COCEIS-E was "Sometimes," and was "Never" for the other four items on the COCEIS-E. Comparing these means with a paired-samples t-test revealed that mean responses to items on the COCEIS-I were significantly greater than responsesto the COCEIS-E items for each sample, with a large, significant pooled effect across samples, $d = 1.10$, $p = .026$. The median response to items on each subscale, however, was 2 ("Sometimes"). The 25th and 75th %ile scores for COCEIS-E were 1 ("Never") and 2, while they were 2 and 3 ("Often") for the COCEIS-I.

Clinical and Demographic Correlates of Externalizing and Internalizing Reactions to OCD

Pearson correlations were computed between each of the COCEIS-E and COCEIS-I subscales and several demographic and clinical characteristics. These correlations were pooled across each sample, as significant heterogeneity of effect sizes between samples were not found for any correlation ($ps > 0.11$). As expected, COCEIS subscales were found to be positively related to the CY-BOCS, $r = 0.34$, $p < .001$ for the COCEIS-I, and $r = 0.36$, $p < .001$ for the COCEIS-E. The COCEIS-E and COCEIS-I showed a trend-level positive relationship with each other, $r = .20$, $p = .050$. Positive, significant, medium-to-large-sized relationships were found between the COCEIS-E and COCEIS-I and the CBCL internalizing subscale. The COCEIS-E showed a significant, large, positive correlation with the CBCL externalizing subscale. Each subscale was related to the C-YBOCS insight item at a trend level

Table 4 Correlations between externalizing and internalizing subscales and clinical/demographic variables

	COCEIS-internalizing	COCEIS-externalizing	C-YBOCS	CBCL-internalizing	CBCL-externalizing	C-YBOCS-insight	Age
Pooled correlations							
COCEIS-internalizing	-	0.20^{+}	0.34***	0.42**	0.055	−0.30	0.008
COCEIS- Externalizing	0.20^{+}	-	0.36***	0.53***	0.60**	0.31	−0.092
Study 1 (N = 50)[a]							
COCEIS- internalizing	-	0.40**	0.30*	0.29*	−0.10	-	0.017
COCEIS- externalizing	0.40**	-	0.35*	0.56***	0.40**	-	0.091
Study 3 (N = 30)[a]							
COCEIS-internalizing	-	0.26	0.34	0.53**	0.25	-	−0.083
COCEIS-externalizing	0.26	-	0.47*	0.36	0.67***	-	−0.29
Study 4 (N = 36)[b]							
COCEIS-internalizing	-	0.14	0.36*	-	-	−0.31	0.071
COCEIS-externalizing	0.14	-	0.24	-	-	0.31	−0.14

CBCL Child Behavior Checklist; *COCEIS* Child Obsessive–Compulsive Externalizing/Internalizing Scale; *OCD* obsessive–compulsive disorder. Sample sizes varied based on pairwise exclusion within samples. "Study 2" was excluded due to a low sample size

$^{+}p = .050$, *p < .05, **p < .01, ***p < .001

[a]The CY-BOCS insight item was not administered with these samples

[b]The CBCL was not administered with this sample

in opposite directions, $r = -.30$, $p = .10$ for the COCEIS-I, and $r = .31$, $p = .09$, though it is worth noting that insight data were only available for one of the samples. A summary of correlations is shown in Table 4, including individual correlations for each sample as well as pooled correlations.

Discussion

This study investigated parents' perceptions of internalizing and externalizing reactions to OCD among children and adolescents. Results provide evidence that parents perceive both externalizing and internalizing behaviors in childhood OCD, as demonstrated by a clear two-factor structure that emerged on the COCEIS. Externalizing behaviors in childhood OCD, such as oppositionality and argumentativeness about OCD-related issues, appear to co-occur with other externalizing behavior problems, while both internalizing and externalizing OCD factors were positively related to each other at a trend level, to comorbid internalizing symptoms, and to symptom severity. This suggests that children with more severe OCD and comorbid internalizing symptoms are likely to experience both externalizing behaviors in OCD (e.g., arguing with family members about rituals, becoming irritated with others who prevent compulsions) and internalizing symptoms of OCD (e.g., being embarrassed about compulsions, experiencing distressing thoughts). The positive relationship between externalizing behaviors in OCD and co-occurring internalizing symptoms is consistent with studies that have found more internalizing symptoms among children with OCD and comorbid disruptive behavior disorders [5, 12]. A comparison of mean responses to externalizing and internalizing items on the COCEIS suggested that parents perceive internalizing reactions to occur significantly more frequently than externalizing reactions. Neither internalizing or externalizing symptoms in OCD showed a significant relationship with insight, though externalizing behaviors in OCD related to poorer insight and internalizing symptom related to improved insight at a trend level. These relationships may have been significant with a larger sample size, as insight data were available for only a subset of participants in this study, though this analysis does not allow us to draw conclusions about the relationship between internalizing and externalizing symptoms in OCD and insight.

Analysis of the data from this study identified unique externalizing and internalizing OCD factors that were positively related to each other, suggesting that externalizing and internalizing symptoms in childhood OCD exist on separate, but related, dimensions, rather than at different ends of one continuous spectrum. Thus, it is possible that youth may have obsessions and compulsions that are expressed as externalizing in some respects (e.g., a child may yell at his or her parents for not buying the right kind of soap) and internalizing in others (e.g., he or she may also be frustrated with and embarrassed about ritualized handwashing), and are likely both tied to overall OCD severity. This finding complements epidemiological studies that have shown significant correlations between internalizing and externalizing disorders, as there may be underlying genetic, temperamental, or environmental susceptibility to both [8, 26].

Though responses on the COCEIS-E showed that 62% of parents indicated their child behaves defiantly in the context of his/her OCD, it is important to note that the most common response to the majority of externalizing items was "Never." Thus, several externalizing reactions evaluated in this study appear particularly uncommon (getting out of chores or responsibilities because of OCD, enjoying obsessions or compulsions). Though results from this study indicate that internalizing reactions to OCD occur more frequently than externalizing reactions, the most common response to items on the COCEIS-I was "sometimes," suggesting that any individual feature evaluated on COCEIS may not be particularly common.

Hypotheses related to insight were unsupported, though it worth noting that each subscale showed nonsignificant trend relationships towards insight in expected directions, with externalizing behaviors tied to OCD being related to poorer insight and internalizing symptoms being related to improved insight. Replication with larger samples and more refined measures of insight (e.g., see Storch et al., 2014 [9]) may demonstrate that children who have less awareness of the excessiveness of obsessions or compulsions show more defiance in the context of their OCD.

Although an internalizing/externalizing classification has traditionally been used exclusively in child psychopathology, factor analyses with large samples consistently show that an internalizing/externalizing disorder dichotomy continues to persist into adulthood [2, 3, 8, 26]. It would be interesting to study the long-term course of children with a more externalizing expression of childhood OCD, and whether these children go on to develop putative obsessive–compulsive spectrum disorders in adulthood that may fall more on the externalizing spectrum, such as impulse control disorder (e.g., impulsive buying, gambling addictions), or disorders characterized by poorer insight and imposition on others (e.g., obsessive–compulsive personality disorder; OCPD). Indeed, it may also be that externalizing features in childhood OCD are indicative of early patterns that can develop into these "adult" disorders. For instance, a child who imposes his rituals on his family members (e.g., the family bookshelf being arranged in a particular order) may continue making these demands as he ages, which could develop into a pattern of rigidity and excessive attention to detail that a clinician may sense as a symptom of OCPD. Long-term follow-up studies may elucidate whether a more externalizing presentation of OCD in childhood corresponds with more chronic psychopathology that manifests as other, more ego-syntonic obsessive–compulsive spectrum disorders in adulthood.

Clinically, it may be that some children with externalizing behaviors in OCD are less willing to engage in exposure therapy. Co-occurring disruptive behavior disorders have been found to interfere with successful treatment outcomes [27], and improvements in coercive-disruptive behaviors in pediatric OCD may mediate improvement in cognitive behavioral therapy with exposure and response prevention [28]. Therapeutic augmentation involving a greater emphasis on behavioral parent training or motivational enhancement strategies may be particularly important for these youth [29–31]. Contingency management for completing exposures may be more needed for children with a more externalizing presentation of OCD.A notable limitation to this study was the smaller number of children who were assessed on the insight item on the CY-BOCS and on the CBCL. Using datasets from different studies resulted in including children with different levels of OCD severity, which may have introduced experimental variability into the present analysis, but may also increase the generalizability of findings to children with OCD across severity levels. It should also be noted that the wording of the COCEIS and the inclusion of only a parent-report measure allows us to draw conclusions about parents' impressions of externalizing and internalizing reactions to their child's OCD, rather than about the inherent structure of OCD. To more definitively show that there internalizing and externalizing behaviors that are specific to OCD, the COCEIS would have to produce different patterns of responses when applied to other conditions (for an example, see Lebowitz, Omer, & Leckman, 2011 [4]). Further, high internal consistency coefficients on the COCEIS-E and COCEIS-I may have indicated that some items were redundant, though it is worth noting that an item analysis did not suggest that removing any items would improve the reliability of either subscale. The factor structure could also be more reliably evaluated with a larger sample size. Future studies might also investigate this measure in more culturally and demographically diverse samples.

Future studies should assess other clinical features that may be related to externalizing and internalizing OCD, such as symptom subtype, parental accommodation, comorbidity with other disorders (e.g., autism spectrum disorder, impulse control disorders), long-term trajectory, and relationship with treatment outcome. Further analyses may investigate whether there are moderating or nonlinear relationships between internalizing/externalizing OCD and other clinical outcomes (e.g., overall symptom severity, functional impairment). Child-report and clinician-rated assessments of these constructs would provide further insight into these phenomena as well. Cluster analytic studies may illuminate whether there are "subtypes" of children with internalizing and externalizing OCD. Psychometric validation of the COCEIS with a larger sample may help replicate our findings and lay groundwork for further study of internalizing and externalizing OCD-related behaviors.

Summary

Externalizing behaviors in childhood OCD appear to be characterized by OCD-specific defiance (e.g., arguing about OCD-related issues, getting upset with others when rituals

are interrupted) as well as more co-occurring behavior problems. Internalizing obsessive–compulsive symptoms (e.g., being embarrassed about compulsions, experiencing distressing thoughts) appear to be independent but related features of childhood OCD, as both appear to be tied to increased overall OCD severity. Clinicians experienced in the treatment of children with OCD are likely familiar with these presentations, but to date there have been a lack of validated assessments that distinguish these phenomena. Future studies should continue to refine our understanding of the implications of this concept, including its relationship with insight, treatment outcome, family functioning, and long-term course.

Appendix

The Child Obsessive-Compulsive Externalizing/Internalizing Scale (COCEIS)

This page has sentences that tell about your child's Obsessive-Compulsive Disorder (OCD) symptoms. We would like to know how true these sentences are about your child. Please read each sentence carefully. Then decide if the sentence is "Never True" about your child, "Sometimes True" about your child, "Often True" about your child or "Always True" about your child. Please remember that there are no right or wrong answers.

	Never	Sometimes	Often	Always
	1	2	3	4
1. My child seems bothered about having OCD	1	2	3	4
2. My child asks me for help when dealing with his/her OCD	1	2	3	4
3. My child is embarrassed about having OCD	1	2	3	4
4. My child argues with me about OCD-related issues	1	2	3	4
5. My child seems to enjoy OCD symptoms that bother me and other family members	1	2	3	4
6. My child gets upset when his/her OCD symptoms are interrupted or prevented	1	2	3	4
7. My child gets out of chores and other responsibilities because of his/her OCD	1	2	3	4
8. My child cries and is often irritable because of their OCD	1	2	3	4
9. There is an oppositional quality to my child's OCD	1	2	3	4
10. My child has intensive distressing ideas or thoughts	1	2	3	4
11. My child enjoys engaging in repetitive ritualistic behaviors	1	2	3	4

Scoring guidelines:

Internalizing subscale (COCEIS-I) = sum of items 1, 2, 3, and 10: _____.

Externalizing subscale (COCEIS-E) = sum of items 4, 5, 6, 7, 8, 9, and 11: _____.

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