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Associations between miscellaneous symptoms and symptom dimensions: An examination of pediatric obsessive–compulsive disorder

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Abstract

Obsessive–compulsive disorder (OCD) in children and adults is a heterogeneous disorder associated with significant psychosocial impairment. Although factor analytic studies have identified symptom dimensions, these analyses do not capture the varied miscellaneous symptoms that fail to load on a specific dimension despite being functionally related. The present study sought to extend the findings of previous research in adults to a sample of youth with OCD ($n = 131$). Logistic regression analyses were used to examine the predictive value of each of the four symptom factors (contamination symptoms, obsessions and checking, symmetry and ordering, and hoarding) to the miscellaneous OCD symptoms. The vast majority of miscellaneous symptoms (17 of the 18 symptoms) were associated with one or more symptoms factors (i.e., contamination symptoms, obsessions and checking, symmetry, and ordering). Hoarding was not related to any miscellaneous symptom. In addition to improving our understanding about the clinical presentation of pediatric OCD, findings also have important assessment (e.g., understanding which miscellaneous symptoms relate to certain dimensions) and treatment implications (e.g., hierarchy development).

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Introduction

Obsessive–compulsive disorder (OCD) in children and adults is a prevalent condition that runs a chronic and impairing course when left untreated (see Lewin, Storch, Merlo, Murphy, & Geffken, 2005 for a review).

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By nature, the symptoms of pediatric OCD are heterogeneous, with many patients experiencing multiple obsessions and compulsions (Leonard, Goldberger, Rapoport, Cheslow, & Swedo, 1990; Rettew, Swedo, Leonard, Lenane, & Rapoport, 1992). Common obsessions include contamination fears, worries about harm to self or others, the need for symmetry, exactness, and order, and religious/moralistic concerns, forbidden thoughts (e.g., sexual or aggressive), or a need to seek reassurance (asking or confessing to others). Common compulsions include decontamination rituals, checking, counting, repeating, straightening, ritualized behaviors, confessing, praying, seeking reassurance, touching, tapping or rubbing, and avoidance (Swedo, Rapoport, Leonard, Lenane, & Cheslow, 1989).

With consideration into the heterogeneous presentation of adult and pediatric OCD, attention has been given to symptom dimensions that may be linked to differential clinical characteristics and/or treatment outcomes (see McKay et al., 2004 for a review). Dimensions of OCD symptoms have generally been identified through factor analytic studies of the Yale-Brown Obsessive-Compulsive Scale (Y-BOCS; Goodman et al., 1989) or Children's Yale-Brown Obsessive-Compulsive Scale (CY-BOCS; Scahill et al., 1997) Symptom Checklists. Among adults, four- and five-factor solutions have been consistently observed. The four-factor solution is comprised of contamination symptoms, obsessions and checking, symmetry and ordering, and hoarding (Baer, 1994; Cullen et al., 2007; Hasler, Kazuba, & Murphy, 2006; Hasler et al., 2007; Leckman, Grice, Boardman, & Zhang, 1997; Summerfeldt, Richter, Antony, & Swinson, 1999). The five-factor solution is comprised of symmetry/ordering, contamination/cleaning, sexual/religious obsessions, aggressive obsessions/checking, and hoarding dimensions (see Mataix-Cols, Rosario-Campos, & Leckman, 2005 for a review). However, the two published studies with child samples have produced inconsistent findings. Delorme et al. (2006) replicated the four-factor model found in adults, whereas McKay et al. (2006) found a four-factor solution in 137 youth consisting of compulsions, sexual/aggressive obsessions, superstitions, and hoarding/ordering/somatic concerns.

Although these efforts to identify OCD symptom dimensions are clinically and prognostically informative (e.g., Abramowitz, Franklin, Schwartz, & Furr, 2003), the analyses do not capture the full range of symptoms included within the Y-BOCS/CY-BOCS Symptom Checklists for several reasons. First, symptoms that do not significantly load on a factor with a given strength are omitted (i.e., factor loading $> .40$; Cullen et al., 2007). Second, some studies have not included miscellaneous symptom items in their analyses (e.g., Hasler et al., 2006). Although many researchers do not state specifically why they decided not to include the miscellaneous items (e.g., Delorme et al., 2006), it may be due to the dichotomous nature of checklist items on the Y-BOCS/CY-BOCS, which precludes conventional factor analysis of individual symptom items. Therefore, in order to create indicators on a ratio or interval scale to be used in factor analysis, past studies typically have aggregated in some way the items composing each of the conceptually derived Y-BOCS/CY-BOCS symptom categories (e.g., Delorme et al., 2006; Leckman et al., 1997). However, because each of the miscellaneous items appears to represent a distinct symptom, not categorized with similar items on the CY-BOCS, it appears that these items cannot be aggregated in any meaningful way to be entered into a factor analysis. This may be one reason why miscellaneous items often are omitted from factor analyses. Other studies state only that miscellaneous items were not included in factor analyses in order to be consistent with prior studies that did not include them (Leckman et al., 1997; McKay et al., 2006; Summerfeldt et al., 1999).

Among youth, information about the CY-BOCS miscellaneous symptoms may be particularly relevant, as children and adolescents typically have different clinical presentations from adults (e.g., increased family accommodation and "just right" compulsions). Indeed, our clinical experiences suggest a relatively high frequency of miscellaneous symptoms such as a need to know or confess, reassurance seeking, and "just right" compulsions that have been associated with varying clinical presentations. In line with the limited empirical data that are reviewed below, our clinical experiences suggest the likelihood of several relationships between miscellaneous symptoms and symptom dimensions. For example, fears of harm or engaging in an impulsive behavior are often related to the miscellaneous symptoms of seeking reassurance (i.e., "Could I do this?") and confessing obsessions (i.e., "I thought _____"), while symmetry/ordering symptoms have been related to "just right" symptoms such as touching and tapping, and needing to do things until it feels "just right." We have also noted an association between contamination/cleaning symptoms and the miscellaneous symptoms of seeking reassurance (i.e., "Will this make me sick?") and needing to tell, ask, or confess in order to insure that

they will not harm others through contamination. Finally, our clinical experiences with adults and youth who hoard suggest the elevated presence of list making, presumably in attempts at organizing possessions.

Several studies have examined the relationship between miscellaneous symptoms and symptom dimensions in adult samples. For example, in a sample of 381 adult OCD patients, Summerfeldt, Kloosterman, Antony, Richter, and Swinson (2004) found that 16 of 18 miscellaneous symptoms assessed by the Y-BOCS Symptom Checklist were predicted by either one (11 of 16 items) or two (5 of 16 items) factors. The obsessions/checking and symmetry/ordering factors were most consistently associated with miscellaneous items. In addition, using cluster analytic methods of the Y-BOCS Symptom Checklist in 106 adult OCD patients, Calamari, Wiegartz, and Janeck (1999) showed that the “obsessionals” cluster, which included miscellaneous symptoms, showed elevated levels of aggressive obsessions, as well as increased checking and repeating rituals. Finally, Leckman et al. (1997) examined the associations between miscellaneous symptoms and the four-factor model described above. The following three items were associated with the obsessions/checking factor: fear of saying certain things; compulsion to tell, ask or confess; and compulsion to prevent harm or terrible consequences. The fear of not saying just the right thing was related to scores on the symmetry/ordering factor. Taken together, the extant findings among adults suggest that miscellaneous symptoms are particularly linked to the obsessions/checking and symmetry/ordering factors, but that the contamination/cleaning and hoarding factors also hold relevance. To date, no published report exists that examines the relationship between miscellaneous symptoms and symptom dimensions in pediatric patients. Thus, the goal of the present study was to extend this research to pediatric patients.

As noted, previous factor analytic studies provide a sound empirical basis for identifying a set of latent dimensions for the Y-BOCS/CY-BOCS Symptom Checklist but exclude potentially clinically relevant symptoms. Better understanding how the “miscellaneous” symptoms correlate with established symptom factors has important clinical implications. With regard to assessment, for example, knowing that unlucky numbers and colors with significance are associated with an obsessions/checking presentation will guide the clinician to more thoroughly screen for such symptoms when assessing this subtype of patients. Regarding treatment, understanding the full range of symptoms associated with a particular dimension would aid the cognitive-behavioral clinician in more effectively constructing ritual hierarchies and exposure/response-prevention exercises.

Although data have been reported for adults, there is little information about associations among miscellaneous symptoms and OCD symptom dimensions in youth. Given this, the purpose of this study was to examine the associations between OCD symptom dimensions and miscellaneous symptoms in a sample of pediatric OCD patients. Hypotheses generated below were based on a synthesis of our clinical experiences and the available literature (i.e., Summerfeldt et al., 2004). With this in mind, we predicted the following:

- (a) Higher scores on the checking/obsessions factor would predict the presence of symptoms related to reassurance seeking and needing to tell, ask, or confess, needing to know or remember details, fear of saying certain things, non-violent mental intrusions, mental compulsions, rituals to prevent harm, and rituals involving blinking or staring.
- (b) Higher scores on the symmetry/ordering factor would predict the presence of symptoms related to needing to know or remember details, fear of not saying just the right thing, touching and tapping rituals, and needing to do things until it feels “just right.”
- (c) Higher scores on the contamination/cleaning factor would be related to the presence of seeking reassurance and needing to tell, ask, or confess.
- (d) Higher scores on the hoarding factor would be related to the presence of excessive list making.

Method

Participants

Participants were 131 children and adolescents (58% male, $n = 76$) aged 5–19 years ($M = 11.03 \pm 3.05$) who presented to the University of Florida OCD Program for treatment. All participants had a principal diagnosis of OCD, according to *DSM-IV-TR* criteria, made by the first or third author in the context of a clinical

interview, and confirmed by independent evaluation using the Anxiety Disorder Interview Schedule for DSM-IV-Child Interview Schedule—Parent version (ADIS-IV—P; Silverman & Albano, 1996). The ADIS-IV—P and CY-BOCS were administered to each participant by a trained independent evaluator as part of a comprehensive assessment received under a clinical treatment protocol in our lab (e.g., Storch et al., in press). Severity of OCD symptoms, as measured with the CY-BOCS, was as follows: 10.7% mild (score of 8–15), 26.7% moderate (16–23), 46.6% severe (24–31), and 16.0% extreme (32–40; Goodman et al., 1989).

Children were excluded from participation if they had a history of psychosis, pervasive developmental disorder, bipolar disorder, or current suicidality; principal diagnosis other than OCD; or documented mental retardation. Those with other comorbid diagnoses were not excluded. The most common comorbidities in this sample included tic disorders ($n = 52$, 33.5%), attention deficit hyperactivity Disorder ($n = 48$, 31.0%), generalized anxiety disorder ($n = 41$, 26.5%), and oppositional defiant disorder ($n = 35$, 22.6%). Other clinical characteristics of the sample are described in Table 1.

Measures

Anxiety disorders interview schedule for DSM-IV: parent version

The ADIS-IV—P (Silverman & Albano, 1996) is a clinician-administered structured interview that is based on DSM-IV diagnostic criteria. The ADIS-IV—P focuses primarily on anxiety disorders, but also screens for related disorders (i.e., disruptive behavior disorders, psychotic disorders, and eating disorders). Diagnoses are based on symptom endorsement, as well as obtaining a distress/impairment severity rating of at least 4 on a scale of 0–8. The ADIS-IV—P has demonstrated excellent psychometric properties (Silverman, Saavedra, & Pina, 2001; Wood, Piacentini, Bergman, McCracken, & Barrios, 2002).

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

The CY-BOCS (Scahill et al., 1997) is a clinician-rated, semi-structured inventory of pediatric OCD symptoms and severity. Given that many youth underestimate their symptoms, the CY-BOCS was administered to parent(s) and child jointly. Developed as a downward extension of the Yale-Brown Obsessive-Compulsive Scale (Goodman et al., 1989), the CY-BOCS Severity Scale consists of two subscales:

Table 1
Clinical characteristics of the sample

Variable ^a	Mean ± SD
<i>CY-BOCS Obsessions Severity Scale</i>	13.53.35
Contamination (10 items)	1.49 ± 2.11
Aggression (11 items)	1.35 ± 2.12
Sexual (4 items)	.23 ± .60
Hoarding (1 items)	.17 ± .38
Magical thinking (2 items)	.21 ± .46
Somatic (2 items)	.31 ± .57
Religious (2 items)	.38 ± .70
<i>CY-BOCS Compulsions Severity Scale</i>	16.207.10
Washing (5 items)	.87 ± 1.26
Checking (8 items)	.91 ± 1.34
Repeating (3 items)	.56 ± .78
Counting (1 item)	.23 ± .42
Ordering (1 item)	.37 ± .49
Hoarding (2 items)	.24 ± .45
Excessive (1 item)	.15 ± .36
Rituals (1 item)	.41 ± .49
CY-BOCS total score	25.116.3

^aCY-BOCS obsession, compulsion, and total scores are derived from Likert-scale ratings of symptom severity, impairment, etc. All other items are derived from the symptom checklist, and represent the mean number of items endorsed within that category.

Obsessions Severity (5 items) and Compulsions Severity (5 items), which are combined to create a Total Score (range 0–40). Items are rated on a 5-point Likert scale assessing the severity of symptoms (i.e., distress, frequency, interference, and resistance) and the child's control over his/her symptoms. The CY-BOCS also contains a checklist of 62 obsessive and compulsive symptoms that does not contribute to the overall score, but provides information about the presence or absence of symptoms. The CY-BOCS Severity Scale has demonstrated high internal consistency, with Total Score α 's ranging from .87 to .90 (Scahill et al., 1997; Storch et al., 2004). The CY-BOCS Severity Scale has strong convergent and divergent validity (Scahill et al., 1997; Storch et al., 2004), and has been shown to be treatment sensitive (Pediatric OCD Study Team, 2004; Storch et al., 2007). No published psychometric data exist for the CY-BOCS Symptom Checklist. Mataix-Cols, Fullana, Alonso, Menchon, and Vallejo (2004) examined the validity of the Y-BOCS Symptom Checklist in 56 adult patients, finding that it was modestly correlated with the Maudsley Obsessive Compulsive Inventory and Padua Inventory total scores (.59 and .60, respectively), but only weakly to moderately related to corresponding factor scores. The Y-BOCS Symptom Checklist discriminant validity was generally good, showing little overlap with depressive or anxiety symptoms.

Procedure

The CY-BOCS Symptom Checklist contains 62 closed-ended items, each representing an obsessive or compulsive symptom. These are separated into categories of obsessions and compulsions. The items used in these analyses were those under the categories of obsessions (i.e., contamination, aggressive, sexual, hoarding/saving, magical, somatic, and religious) and compulsions (i.e., washing, checking, repeating, counting, ordering/arranging, hoarding/saving, magical games, and rituals involving other persons) and the items from the miscellaneous category under each (e.g., "fear of saying certain things", "the need to tell, ask, or confess"). The CY-BOCS Symptom Checklist also contains 12 open-ended questions, which were excluded from analysis given that the content of these items is not standardized and may vary widely across patients and raters (Summerfeldt et al., 1999, 2004).

A four-factor model of OCD symptoms was used in this study, as described by Baer (1994) and replicated by others (e.g., Leckman et al., 1997; Summerfeldt et al., 1999). This model was chosen as it has been found consistently in studies with adults (Baer, 1994; Cullen et al., 2007; Leckman et al., 1997; Summerfeldt et al., 1999) and replicated in a study with children (Delorme et al., 2006). In addition, using this model allows for optimal comparison with results from Summerfeldt et al. (2004). This model includes the following four factors, with the specific items listed in parentheses: obsessions and checking (aggressive, sexual, religious, and somatic obsessions, and checking compulsions, 23 total items), symmetry and ordering (symmetry obsessions and ordering/arranging, counting, and repeating compulsions, six total items), cleanliness and washing (contamination obsessions and cleaning compulsions, 13 total items), and hoarding (hoarding/saving obsessions and hoarding/collection compulsions, two total items).

Analytic plan

Although an item-level factor analysis would have been a preferable approach to use to examine the CY-BOCS Symptom Checklist factor structure, the sample size in the current study was not large enough to allow such an analysis to take place with a reasonable amount of power. Indeed, Bentler and Chou (1987) have suggested that the ratio of number of cases per item (n/q) be at least five when using maximum likelihood estimation assuming reasonable distributional conditions. Unfortunately, these conditions are not met in the present study and thus we use the four-factor model described in Summerfeldt et al. (2004) given its strong support and for comparison purposes. To examine the predictive value of each of the four-symptom factors to the miscellaneous OCD symptoms, logistic regression analyses were conducted. This method allows for the prediction of the presence or absence of a symptom (i.e., the miscellaneous symptoms on the CY-BOCS) from a set of variables, namely scores on the four-symptom factors of Symmetry, Obsessions and Checking, Contamination and Cleaning, and Hoarding (Summerfeldt et al., 2004), with no assumptions concerning equal variance across outcomes, distributions of predictors, or linear relationships among predictors (Tabachnick & Fidell, 1996). Using logistic regression also allows for comparison to the adult literature

examining the relationship between miscellaneous symptoms and symptom dimensions (e.g., Summerfeldt et al., 2004).

A series of single logistic regression analyses were performed, with the dependent variables being each of the 18 miscellaneous OCD symptoms on the CY-BOCS and the predictors consisting of the scores on the four aforementioned factors. Following methods described in Summerfeldt et al. (2004), for each of the 13 sets of symptoms within the four-factor scores (listed above), weighted scores were calculated by taking the sum of items endorsed for that set of symptoms and dividing that number by the total number of potential items in that particular set of symptoms. These 13 weighted scores were then summed to create the four-factor scores used in the regressions. Given the exploratory nature of this study and lack of previous work with this population, a significance level of $p \leq .05$ was employed.

Results

The results of the logistic regressions, including odds ratios and 95% confidence intervals, are reported in Table 2; regression coefficients (*B*) and Wald statistics are reported here for statistically significant results. A total of 17 of the 18 miscellaneous symptoms were associated with one or more symptom factors at a significance level of $p \leq .05$ (see Table 3). Nine symptoms were significantly associated with the obsessions and

Table 2
Summary of logistic regressions predicting miscellaneous CY-BOCS symptoms from symptom factors

Miscellaneous item	% with	CY-BOCS factor							
		Obsessions and checking		Symmetry/ordering		Contamination and cleaning		Hoarding	
		Odds ratio (95% CI)	<i>p</i>	Odds ratio (95% CI)	<i>p</i>	Odds ratio (95% CI)	<i>p</i>	Odds ratio (95% CI)	<i>p</i>
<i>Obsessions</i>									
Need to know or remember	30.5	.9 (.4–1.9)	.832	2.6 (1.3–5.2)	.006**	4.1 (1.6–10.2)	.003**	1.0 (.4–2.5)	.978
Fear of saying certain things	11.5	2.9 (1.2–7.3)	.022*	1.5 (.6–3.7)	.334	1.7 (.5–5.7)	.352	1.6 (.5–5.0)	.407
Fear of not saying just the right thing	16.8	1.4 (.6–3.3)	.393	2.7 (1.2–6.1)	.020*	1.6 (.5–4.6)	.407	2.3 (.9–5.9)	.095
Intrusive (non-violent) images	16.0	2.6 (1.1–6.0)	.022*	.9 (.5–2.0)	.914	5.0 (1.8–14.3)	.002**	.9 (.3–2.7)	.793
Intrusive sounds, words, music, or numbers	13.7	2.1 (.9–5.1)	.090	3.0 (1.2–7.3)	.015*	1.2 (.4–3.7)	.789	1.4 (.5–3.9)	.520
<i>Compulsions</i>									
Mental rituals	11.5	3.2 (1.3–8.0)	.011*	1.2 (.5–2.7)	.748	2.7 (.9–8.4)	.091	.9 (.3–3.2)	.883
Need to tell, ask, confess	36.6	.9 (.4–1.8)	.724	1.8 (.9–3.3)	.085	4.9 (1.9–12.3)	.001**	1.1 (.5–2.6)	.854
Measures to prevent harm to self	12.2	2.9 (1.2–7.0)	.021*	1.1 (.5–2.6)	.769	3.4 (1.1–10.5)	.035*	1.2 (.4–3.8)	.793
Measures to prevent harm to others	11.5	3.2 (1.3–8.2)	.014*	1.5 (.6–3.6)	.356	2.5 (.8–8.3)	.125	1.1 (.3–3.7)	.848
Measures to prevent terrible consequences	7.6	3.5 (1.2–10.4)	.024*	1.2 (.4–3.4)	.726	3.6 (.9–14.7)	.069	1.2 (.3–5.3)	.779
Ritualized eating behaviors	21.4	1.2 (.6–2.5)	.661	2.1 (1.0–4.1)	.041*	1.1 (.4–2.7)	.881	1.2 (.5–3.0)	.677
Excessive list making	5.3	2.4 (.8–7.1)	.132	1.1 (.3–3.4)	.923	6.9 (1.5–33.6)	.015*	.1 (.0–1.5)	.059
Need to touch, tap, rub	28.2	2.5 (1.2–5.0)	.011*	2.2 (1.1–4.1)	.026*	.7 (.3–1.7)	.442	1.1 (.4–2.6)	.903
Need to do things until it feels just right	31.3	1.5 (.7–3.0)	.308	3.4 (1.7–6.9)	.001**	1.9 (.8–4.8)	.149	1.0 (.4–2.5)	.991
Rituals involving blinking or staring	10.7	3.5 (1.3–9.4)	.013*	2.6 (1.0–6.5)	.048*	1.7 (.5–6.0)	.410	.8 (.2–2.6)	.671
Trichotillomania	5.3	2.3 (.9–5.5)	.064	.7 (.3–1.8)	.467	1.6 (.5–5.3)	.412	.3 (.1–2.1)	.247
Other self-damaging or self-mutilating	9.9	.3 (.1–.7)	.007**	1.1 (.5–2.2)	.806	.8 (.3–2.1)	.700	.9 (.3–2.4)	.820

* $p \leq .05$.

** $p \leq .01$.

Table 3
CY-BOCS factors and associated miscellaneous symptoms

CY-BOCS factor	Associated miscellaneous symptoms
Obsessions and checking	Fear of saying certain things Intrusive (non-violent) images Mental rituals Measures to prevent harm to self Measures to prevent harm to others Measures to prevent terrible consequences Need to touch, tap, rub Rituals involving blinking or staring Other self-damaging or self-mutilating
Symmetry/ordering	Need to know or remember Fear of not saying just the right thing Intrusive sounds, words, music, or numbers Ritualized eating behaviors Need to touch, tap, rub Need to do things until it feels just right Rituals involving blinking or staring
Contamination and cleaning	Need to know or remember Intrusive (non-violent) images Need to tell, ask, confess Measures to prevent harm to self Excessive list making
Hoarding	None

checking factor: “fear of saying certain things” ($B = 1.07$, Wald = 5.26), “intrusive (non-violent) images” ($B = .96$, Wald = 5.24), “mental rituals” ($B = 1.17$, Wald = 6.51), “measures to prevent harm to self” ($B = 1.05$, Wald = 5.35), “measures to prevent harm to others” ($B = 1.17$, Wald = 6.01), “measures to prevent terrible consequences” ($B = 1.25$, Wald = 5.13), “need to touch, tap, or rub” ($B = .90$, Wald = 6.40), “rituals involving blinking or staring” ($B = 1.25$, Wald = 6.19), and “other self-damaging or self-mutilating behaviors” ($B = -1.27$, Wald = 7.21).

On the symmetry/ordering factor, a total of seven miscellaneous symptoms were significantly associated: “need to know or remember” ($B = .97$, Wald = 7.70), “need to do things until it feels just right” ($B = 1.23$, Wald = 11.58), “fear of not saying the right thing” ($B = .98$, Wald = 5.38), “intrusive sounds, words, music, or numbers” ($B = 1.14$, Wald = 5.97), “ritualized eating behaviors” ($B = .71$, Wald = 4.18), “need to touch, tap, or rub” ($B = .75$, Wald = 4.94), and “rituals involving blinking or staring” ($B = .95$, Wald = 3.93).

For the contamination and cleaning factor, five symptoms were significantly related: “need to know or remember” ($B = 1.40$, Wald = 8.86), “intrusive (non-violent) images” ($B = 1.62$, Wald = 9.20), “need to tell, ask, confess” ($B = 1.58$, Wald = 11.20), “measures to prevent harm to self” ($B = 1.22$, Wald = 4.45), and “excessive list making” ($B = 1.94$, Wald = 5.87). However, as observed by Summerfeldt et al. (2004), the hoarding symptom factor was not significantly associated with any miscellaneous symptom. Finally, “trichotillomania” was the only miscellaneous symptom not significantly associated with a symptom factor at a significance level of at least $p \leq .05$.

Discussion

Due to the multifaceted nature of OCD and the multitude of ways in which symptoms manifest, researchers have sought to identify latent dimensions through factor analyses of OCD symptom measures. Such studies have typically revealed the presence of four symptom dimensions, including symmetry/ordering, contamination/cleaning, obsessions/checking, and hoarding (e.g., Delorme et al., 2006; Mataix-Cols et al., 2005).

However, a limitation of previous studies is omission of “miscellaneous” symptoms in the analytic plan or output. Given that many of these miscellaneous symptoms are common among individuals with OCD, further investigation into their relations to the primary symptom dimensions of OCD is warranted. Research in this area is particularly important for child and adolescent patients because, as indicated by the present study, many of these miscellaneous symptoms are quite common among youth with OCD and significantly impact functioning. Following procedures outlined by [Summerfeldt et al. \(2004\)](#) in their study of adult OCD patients, a series of logistic regression analyses were conducted, in which the four primary symptom factors were entered as predictors for each of the miscellaneous symptoms.

As hypothesized, and consistent with the findings of [Summerfeldt et al. \(2004\)](#), higher scores on the obsessions/checking factor predicted the presence of fear of saying certain things, measures to prevent harm to self, others, and other terrible consequences, mental rituals, and non-violent intrusive images. These findings make conceptual sense, as they largely reflect themes of possible harm, as well as attempts to prevent potentially catastrophic outcomes (e.g., performing mental rituals in order to “undo” or “make up for” engaging in behaviors that one believes could lead to a loved one being harmed). In addition, these symptoms appear to reflect the tendency to over-interpret situations or experiences as threatening or potentially damaging, such as interpreting the experience of intrusive mental images as uncontrollable or as a sign that one is going crazy.

The obsessions/checking factor also predicted the need to touch, tap, or rub and rituals involving blinking and staring. Our clinical experience suggests that people with OCD often engage in these types of behaviors as a means of checking to prevent something bad from happening. For example, a person might engage in rituals involving staring at the knobs on the stove or touching the burners repeatedly in order to make certain that he or she has correctly perceived that they are turned off. Others report touching things repeatedly in order to neutralize obsessions or associated anxiety (e.g., “it does not feel right until this item is touched six times”). Finally, the obsessions/checking factor predicted the presence of self-damaging or self-mutilating behaviors (other than trichotillomania). This may be because this factor contains items involving aggressive and somatic themes, which may account for its relation to self-damaging behaviors. For example, some children report hitting their head to drive away disturbing obsessive thoughts or picking at body parts due to imagined deformities.

As hypothesized, the symmetry/ordering factor predicted the need to do things until it feels “just right,” fears of not saying just the right thing, the need to know or remember, and the need to touch, tap, or rub. These findings make conceptual sense, as these miscellaneous symptoms and items comprising the symmetry/ordering factor largely reflect the need for things to feel “just right,” to do things perfectly or correctly, or to be thorough and complete. Furthermore, the link between symmetry and ordering symptoms and endorsement of the need to do things until it feels “just right” may be explained by the less well-developed cognitive abilities of children, as many youth have difficulty articulating reasons why they feel compelled to engage in rituals. Alternatively, some have suggested that “just right” symptoms may reflect a form of “Tourette OCD” ([Mansueto & Keuler, 2005](#); [Storch et al., in press](#)), in which symptoms of both disorders overlap. Indeed, higher rates of touching, tapping, and rubbing rituals, concerns about symmetry and exactness, and “just right” sensations or urges have been reported more among individuals with comorbid OCD and tic disorders, compared with those with OCD but no tic disorder ([Leckman et al., 1994](#); [Leckman, McDougle, & Pauls, 2000](#)). Behaviorally, this may be because tics often serve to reduce tension in a manner that is functionally similar to the relation between compulsions and anxiety ([Leckman, Walker, & Cohen, 1993](#); [Woods, Piacentini, & Himle, 2005](#)). It is possible that, over time, cognitive attributions become linked to some tics (e.g., “If I do not tap the table a certain way, something bad will happen”), thereby transforming the tic into a compulsion ([Storch et al., in press](#)).

Interestingly, the need to touch, tap, or rub and rituals involving blinking or staring were not only predicted by the obsessions/checking factor, but by the symmetry/ordering factor as well. This may be because, as posited by [Summerfeldt et al. \(2004\)](#), OCD symptoms that appear on the surface to be similar may arise from or be characterized by different underlying motivations or purposes. Thus, some individuals may feel compelled to engage in repetitive touching, tapping, or rubbing, or blinking and staring behaviors, in an attempt to feel “just right” or to make sure that it is “perfect,” rather than as a means of reducing unwanted obsessions or checking to prevent some harmful consequence.

Consistent with our hypothesis, the contamination/cleaning factor significantly predicted the need to tell, ask, or confess. Children with OCD often ask questions or repetitively initiate discussions with the aim of obtaining reassurance from others that something bad will not happen to themselves or those they care about. Therefore, reassurance seeking may be associated with the contamination/cleaning factor because both involve the possibility that someone may be harmed (particularly themselves), as well as attempts to reduce this fear by engaging in certain behaviors (e.g., seeking reassurance from others, engaging in cleaning rituals). For example, our clinical experience suggests that it is common for children who worry about contracting an illness or infection to seek frequent reassurance from parents that this will not actually occur (e.g., a patient who repeatedly asks her mother whether an unknown substance is blood or whether a cut was deep enough to cause an infection). Consistent with this theme of harm prevention, the contamination/cleaning factor was also associated with measures to prevent harm to self and the need to know or remember, both of which may reflect strategies to prevent harmful consequences. For example, children may wear gloves to protect themselves from germs or seek additional information about how to prevent contracting a disease. Additionally, intrusive images of a nonviolent nature were associated with the contamination/cleaning factor. Again, our clinical experience suggests that it is not unusual for youth with contamination symptoms to also experience intrusive images reflecting similar themes (e.g., a child who repeatedly experiences an intrusive image of a green, amoeba-like germ).

Finally, contrary to expectations and divergent from Summerfeldt et al. (2004), the hoarding factor was not associated with excessive list making. Although the reasons for this difference were not immediately clear, one possible explanation is that, relative to adults, young children may be more limited in their ability to create lists. Indeed, we found that (along with trichotillomania) excessive list making was the least commonly endorsed symptom among our sample (endorsed by only 5.3%). Thus, it may be that this behavior develops among individuals with hoarding tendencies as they become more proficient with writing and list making. A second possible explanation is that, because relatively few hoarding symptoms were endorsed by participants, correlations were truncated due to restricted range in hoarding symptoms as a predictor variable (Alexander, Carson, Alliger, & Barrett, 1984).

Taken together, findings of this and other research (Summerfeldt et al., 2004) that a number of miscellaneous symptoms are predicted by more than one symptom dimension suggest that OCD symptoms that appear on the surface to be of the same type (e.g., touching, tapping, or rubbing compulsions) may actually serve dissimilar purposes for different people (e.g., attempting to satisfy the need for something to feel “just right” versus checking to prevent a harmful consequence). In other words, the superficial form of a symptom does not necessarily provide information about its underlying function. One limitation of current OCD symptom measures such as the Y-BOCS and CY-BOCS is that, although they offer information about the presence or absence of symptoms, they do not provide information about the underlying purpose or motivation behind specific symptoms. Knowing the specific function of symptoms is important, because the direction of effective treatment often depends upon the underlying motivation for symptoms. For example, cognitive therapy to address an excessive need to know or remember might focus on reframing thoughts related to perfectionism and the need to be overly thorough for one person, and thoughts reflecting overestimations of threat and harmful consequences for another. Similarly, behavioral exposures to address touching and tapping behaviors motivated by the need to check to prevent harmful consequences might involve refraining from engaging in these behaviors altogether, whereas exposures to address touching and tapping compulsions motivated by a need to do so “just right” might also involve touching or tapping in an “incorrect” or “incomplete” way. There currently is a need for development and/or refinement of measures to assess the motivation or function of OCD symptoms. In the meantime, it seems important that clinicians follow up on symptoms endorsed by patients by asking about the purpose or function of the symptom, in order to facilitate case conceptualization and treatment planning. The focus of extant measures on the typology of OCD symptoms, rather than on their function, also may have contributed to some inconsistent findings across studies regarding the composition of OCD symptom dimensions and subtypes, as respondents may be endorsing certain symptoms for different reasons. Measures that take into consideration the function of OCD symptoms may generate more consistent findings across studies.

Certain limitations should be considered when interpreting the results of the present study. First, the sample consisted of pediatric patients presenting to an outpatient specialty OCD clinic. It is unknown whether the

present results would generalize to other clinical settings or to community samples. Second, due to a modest sample size, we were unable to examine how the relations between OCD symptom dimensions and miscellaneous symptoms may differ according to age. For example, it is conceivable that relations between miscellaneous symptoms that involve family members (i.e., asking, telling, or confessing) and symptom dimensions may be more robust for younger than older youth by virtue of family members' greater involvement in symptoms. Alternatively, measures to prevent terrible consequences or harm to self and others may be more strongly related to symptom dimensions for older versus younger youth given their more developed cognitive abilities (i.e., abstract thinking). Future studies that include larger samples of participants at different ages are needed to examine potential developmental differences. Third, given the exploratory nature of this study, a statistical correction was not used to control for type I error; thus, results should be interpreted bearing this in mind. Finally, there is very little psychometric data available for the CY-BOCS Symptom Checklist (in contrast to the CY-BOCS Severity Scale). Studying the reliability and validity of the CY-BOCS Symptom Checklist is highlighted for future research. In addition, given the controversy regarding if and to what degree symptoms of trichotillomania and self-mutilation are related to OCD per se (i.e., Abramowitz & Deacon, 2005; Ferrao, Almeida, Bedin, Rosa, & Busnello, 2006), it is reasonable to suggest that the CY-BOCS Symptom Checklist is somewhat over-inclusive in including symptoms of trichotillomania and self-mutilation.

Although there are many possible avenues for further research in this area, the present study is an important first step in examining the relations among OCD symptom dimensions and miscellaneous symptoms among children and adolescents. Research in this area has a number of clinical implications. In particular, information about which symptoms typically occur together can be useful when assessing youth with OCD, as it can be used by clinicians to determine when to ask about additional, typically co-occurring symptoms. Furthermore, understanding the varied relations among symptom dimensions and miscellaneous symptoms will facilitate the development of ritual hierarchies in cognitive-behavioral treatment paradigms. It also may be helpful to identify symptom dimensions and the miscellaneous symptoms that tend to occur with them, as different symptom dimensions may respond more or less favorably to certain clinical interventions. Greater understanding of the nature of OCD and the symptoms that comprise different dimensions of the disorder would increase our ability to tailor treatments to an individual's specific constellation of symptoms, thereby enhancing the efficacy of treatments for the disorder.

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