

## Developmental Aspects of Obsessive Compulsive Disorder: Findings in Children, Adolescents, and Adults

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Although juvenile obsessive compulsive disorder (OCD) is increasingly recognized as a putative developmental subtype of the disorder, comparisons among children, adolescents, and adults with OCD have been lacking. We aimed to evaluate clinical correlates of OCD in three developmentally distinct groups. Subjects comprised children, adolescents, and adults meeting DSM-III-R and DSM-IV criteria for OCD referred to separate specialized OCD clinics. All subjects were systematically evaluated with structured diagnostic interviews and clinical assessments by OCD experts. Specific clinical correlates and symptom profiles were associated with the disorder in different age groups. These findings support a hypothesis of developmental discontinuity between juvenile and adult OCD and identify age specific correlates of the disorder across the life cycle. Further work is needed to validate whether juvenile-onset OCD represents a true developmental subtype of the disorder.

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A review of research over the last decade into obsessive compulsive disorder (OCD) affecting children and adolescents has produced evidence suggesting that the juvenile form of the disorder may differ in important ways from its adult counterpart (Geller et al., 1998). This hypothesis is based on findings from juvenile OCD samples that show a distinct peak of onset in childhood along with clinical correlates that have not been reported in adult OCD samples: male preponderance and high levels of comorbidity with disruptive behavior and specific developmental disorders (Geller et al., 1996; Hanna, 1995; Last and Strauss, 1989; Riddle et al., 1990; Swedo et al., 1989; Thomsen, 1993; Toro et al., 1992). Despite the heuristic relevance of these intriguing observations, to our knowledge they have not been systematically investigated by directly contrasting pediatric and adult OCD samples.

The evaluation of whether juvenile OCD presents developmental features that differ from its adult counterpart has important clinical and scientific implications. Clinically, if juvenile OCD is associated with unique clinical correlates, such as comorbidity with disruptive behavior or tic disorders, then recognition of these could assist clinicians in their evaluation and treatment of early onset OCD patients by focusing attention on the presence and impact of comorbid symptoms.

Scientifically, the study of developmentally specific subtypes could help characterize those features of OCD associated with each stage. Such work might identify developmentally specific patterns of etiology, course, and treatment response, which, in turn, could increase the specificity of treatment of this disorder. For example, research efforts aimed at identifying OCD-associated genes are likely to be more successful if developmentally homogeneous samples are studied instead of combining data from children, adolescents, and adults, as is commonly done in OCD studies.

The purpose of this study was to evaluate the developmental continuity of OCD across the life cycle by comparing data from juvenile and adult OCD patients. Because adolescent cases represent an intermediate age group that might equally resemble either child or adult cases, we compared the clinical correlates of OCD in children and adolescents from a large clinical sample and compared them with published data from the adult OCD liter-

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ature. We addressed three competing hypotheses: a) children and adolescents with OCD are similar to each other but different from adults with OCD (syndromatic discontinuity hypothesis—unitary juvenile subtype); b) children with OCD are dissimilar to adolescents and adults with OCD, but adolescent and adult OCD are similar to each other (syndromatic discontinuity hypothesis—no unitary juvenile subtype); and c) OCD is similar in children, adolescents, and adults (syndromatic continuity hypothesis).

### Methods

We recruited consecutive referrals since 1995 to a pediatric OCD clinic under the direction of the lead author (DG). All subjects ( $N = 101$ ) were comprehensively evaluated by the lead author, an experienced, board-certified pediatrician and child and adolescent psychiatrist specializing in the evaluation and management of pediatric OCD. At the time of evaluation, a detailed medical history questionnaire was reviewed, including perinatal, neurological, and developmental history. At the time of the clinical assessment, the Children's Yale-Brown Obsessive Compulsive Scale and Symptom Checklist (CY-BOCS; Goodman et al., 1989a, 1989b) was completed by the lead author with both the child and the parent. The CY-BOCS is a 10-item anchored ordinal scale (0 to 4) that rates the clinical severity of the disorder by scoring the time occupied, degree of life interference, subjective distress, internal resistance, and degree of control for both obsessions and compulsions. It has been validated for use with pediatric subjects (Scahill et al., 1997). It also includes a symptom checklist of over 60 symptoms of obsessions and compulsions categorized by the predominant theme involved, such as contamination, hoarding, washing, checking, etc. The CY-BOCS differs only slightly from the adult Y-BOCS in symptoms recorded and not at all in the scoring method.

In addition, all subjects underwent an indirect structured diagnostic interview with a parent, usually the mother, using the Schedule for Affective Disorders and Schizophrenia-School Age Child: Epidemiological version (KIDDIE-SADS-E; Orvaschel and Puig-Antich<sup>4</sup>) to obtain all current and lifetime DSM III-R and DSM IV psychiatric diagnoses. These were administered by trained and supervised psychometricians, usually bachelor's level psychology graduates who have undergone a rigorous super-

vised training in the administration of this and other psychometric instruments. All structured interviews were reviewed at weekly clinical review meetings attended by at least two board-certified child and adolescent psychiatrists, who were blind to the identity of the subject, before final diagnoses were assigned. All interviews were audio taped. Agreement between raters and experienced clinicians has been excellent ( $N = 175$  interviews, mean overall Kappa coefficient of correlation = .9). We obtained a Kappa of .99 for attention deficit hyperactivity disorder (ADHD), .97 for oppositional defiant disorder and panic disorder, and .95 for overanxious disorder. A Kappa of 1.0 was obtained for tics. In addition, the lead author blindly rescored 40 taped interviews and achieved a Kappa coefficient of .87 for OCD. In addition, all structured diagnostic interview information was subsequently re-reviewed by the lead author at the time of the clinical evaluation with the child or adolescent and their family to ensure that it was clinically meaningful. To be included in this review, subjects had to meet all DSM-IV criteria for OCD at structured interview as well as at clinical evaluation with the lead author. Positive diagnosis, symptomatology, and clinical severity were determined by a review of all data, including both structured and clinical interview information from multiple informants, using a best estimate method (Leckman et al., 1982) by the lead author. In the few instances where there were discrepancies between parental and youth reports, this was resolved in favor of the informant that the lead author deemed most reliable.

For comparison with our pediatric subjects, we used published data on adult OCD samples from a major specialty OCD program (Rasmussen and Eisen, 1998). Diagnoses of OCD and of comorbid disorders in adult subjects were made by both clinical evaluation by OCD experts as well as structured diagnostic interviews using the Schedule for Affective Disorders and Schizophrenia (SADS; Puig-Antich and Chambers<sup>4</sup>). Comparisons were made using chi-square tests for categorical data and logistic regression for continuous data as indicated. All tests were two-tailed, and statistical significance was set at  $p < .05$ .

### Results

Of the 101 pediatric OCD subjects, 46 were younger (<12 years; OCD children) and 55 were equal or older than 12 years of age ( $\geq 12$  years; OCD adolescents). For comparison, we used published data from a large study of adult OCD ( $N = 560$  clinical symptoms and  $N = 60$  comorbid diagnoses;

<sup>4</sup> Puig-Antich J, Chambers WJ (1978) *Schedule for Affective Disorders and Schizophrenia for School-Age Children* (Present Episode Version; K-SADS-P). Western Psychiatric Institute and Clinic, University of Pittsburgh School of Medicine. Unpublished manuscript.

TABLE 1  
Demographic Information in Child vs. Adolescent vs. Adult OCD Subjects

	Children ( <i>N</i> = 46)		Adolescents ( <i>N</i> = 55)		Adults ( <i>N</i> = 560)		Z Score	<i>p</i>
	Mean	SD	Mean	SD	Mean	SD		
Age at onset	6	2.5	10	3.2	21	9.6	4.9	<.001 <sup>a</sup>
Male	<i>N</i> 31	% 67	<i>N</i> 35	% 64	<i>N</i> 258	% 46	N/A	.002 <sup>b,c</sup>

<sup>a</sup> Logistic regression comparing children vs. adolescents.

<sup>b</sup> Significance between children and adults ( $p < .05$ ).

<sup>c</sup> Significance between adolescents and adults ( $p < .05$ ).

TABLE 2  
Symptoms of Obsessions and Compulsions in Child vs. Adolescent vs. Adult OCD Subjects

	Children ( <i>N</i> = 46)		Adolescents ( <i>N</i> = 55)		Adults ( <i>N</i> = 560)		<i>p</i>
	<i>N</i>	%	<i>N</i>	%	<i>N</i>	%	
Obsessions							
Aggressive/catastrophic	29	63	38	69	174	31	<.001 <sup>b,c</sup>
Religious	7	15	20	36	56	10	<.001 <sup>a,c</sup>
Sexual	5	11	20	36	134	24	.011 <sup>a,b,c</sup>
Contamination	24	52	35	64	280	50	.15
Somatic	15	33	20	36	185	33	.88
Compulsions							
Hoarding	14	30	20	36	101	18	.001 <sup>b,c</sup>
Counting	20	44	23	42	202	36	.40
Confessing/asking	15	33	11	20	190	34	.11
Checking	29	63	36	65	342	61	.80
Ordering/arranging	17	37	18	33	157	28	.36
Washing	22	48	31	56	280	50	.63

<sup>a</sup> Significance between children and adolescents ( $p < .05$ ).

<sup>b</sup> Significance between children and adults ( $p < .05$ ).

<sup>c</sup> Significance between adolescents and adults ( $p < .05$ ).

OCD adults). Thus, comparisons were made between a) OCD children ( $N = 46$ ), b) OCD adolescents ( $N = 55$ ), and c) OCD adults ( $N = 560$  or  $60$ ).

### Demographics

Sociodemographic characteristics are described in Table 1. Both child and adolescent groups showed clear male preponderance (67% and 64%) that differed significantly from the adult sample (46%,  $p < .002$ ). Age at onset of OCD was different for the three groups (6 years vs. 10 years vs. 21 years,  $p < .001$ ). There were no other sociodemographic differences between the groups.

### OCD Symptoms

As shown in Table 2, several differences between children, adolescents, and adults were noted in the frequency of particular obsessions and compulsions. Children and adolescents had much higher rates of aggressive obsessions (including fears of catastrophic events, such as death or illness in self or loved ones) than adults (63% vs. 69% vs. 31%,  $p < .001$ ). These were the most common obsessions in

the pediatric age group. On the other hand, religious obsessions were over represented in adolescents (36%) compared with children (15%) and adults (10%;  $p < .001$ ), and sexual obsessions were underrepresented in children (11%) compared with adolescents (36%) and adults (24%;  $p = .011$ ). For compulsions, only hoarding was seen more often in children and adolescents than in adults (30% and 36% vs. 18%, respectively,  $p = .001$ ; Table 2).

### OCD Symptom Characteristics

The mean CY-BOCS score ( $23 \pm 6.5$ ) did not differ between the child and adolescent OCD subjects. Although the majority of subjects in all groups had both multiple obsessions and compulsions, these rates were significantly higher in children and adolescents than in adults (multiple obsessions 93% and 96% vs. 72%,  $p < .001$ ; multiple compulsions 100% and 100% vs. 58%,  $p < .001$ ). Poor insight was noted more often in child OCD cases (18%) than in adolescent (6%) and adult (6%) OCD subjects ( $p = .01$ ). In only 15% of pediatric subjects were clear precipitating factors identified compared with 29% of adult

TABLE 3  
*Characteristics of Obsessions and Compulsions in Children vs. Adolescents vs. Adults OCD Subjects*

	Children (N = 46)		Adolescents (N = 55)		Adults (N = 560)		p
	N	%	N	%	N	%	
Multiple obsessions	43	93	53	96	403	72	<.001 <sup>b,c</sup>
Multiple compulsions	46	100	55	100	325	58	<.001 <sup>b,c</sup>
Poor insight	8	18	3	6	29/475 <sup>d</sup>	6	.010 <sup>a,b</sup>
Precipitating factors	6	14	8	16	162	29	.015 <sup>b,c</sup>

<sup>a</sup> Significance between children and adolescents ( $p < .05$ ).

<sup>b</sup> Significance between children and adults ( $p < .05$ ).

<sup>c</sup> Significance between adolescents and adults ( $p < .05$ ).

<sup>d</sup> Adult sample size = 475, taken from *Rasmussen and Eisen, 1993*.

TABLE 4  
*Comorbidity in Children vs. Adolescent vs. Adult OCD Subjects*

	Children (N = 46)		Adolescents (N = 55)		Adults (N = 100)		p
	N	%	N	%	N	%	
MDD	18	39	34	62	47	78	<.001 <sup>a,b,c</sup>
Psychosis	4	9	7	13	67/475 <sup>d</sup>	14	.58
Tourette's disorder	11	25	5	9	4	6	.014 <sup>a,b</sup>
Anxiety disorders							
Panic	8	18	13	24	9	15	.46
Social phobia	6	14	8	15	16	26	.15
Specific phobia	16	36	12	22	17	28	.32
Separation anxiety	25	56	19	35	10	17	<.001 <sup>a,b,c</sup>
Alcohol abuse/dependence	0	0	1	2	10	16	.001 <sup>b,c</sup>
Disruptive disorders							
ADHD	23	51	20	36	N/A	N/A	.14
Conduct	1	2	7	13	N/A	N/A	.05
Oppositional	23	51	26	47	N/A	N/A	.70
Anorexia/bulimia	0	0	1	2	5	8	.053 <sup>b</sup>

<sup>a</sup> Significance between children and adolescents ( $p < .05$ ).

<sup>b</sup> Significance between children and adults ( $p < .05$ ).

<sup>c</sup> Significance between adolescents and adults ( $p < .05$ ).

<sup>d</sup> Adult sample size = 475, taken from *Rasmussen and Eisen, 1993*.

subjects ( $p = .015$ ). Examples include maternal hemorrhage and sudden hospitalization, death of a grandparent, reading the book *Outbreak* (about a lethal virus), and watching a TV program on AIDS (Table 3).

#### Comorbid Disorders

The rate of major depression was significantly lower in children (39%) than in adolescents (62%) and adults (78%;  $p < .001$ ). In contrast, Tourette's disorder was more common in children (25%) than in adolescents (9%) and adults (6%;  $p = .014$ ). Non-OCD anxiety disorders were highly prevalent in all age groups with only separation anxiety disorder showing significantly higher frequency in children (56%) and adolescents (35%) compared with adults (17%;  $p < .001$ ). Adults had significantly higher rates of substance abuse/dependence (16%) compared with adolescents (2%) and children (0%;  $p = .001$ ). In

addition, adults (8%) had more eating disorders than either children (0%) or adolescents (2%;  $p = .053$ ). Although disruptive behavior disorders were not reported in the adult sample, they were highly prevalent in both children and adolescents (51% vs. 36% for ADHD,  $p = .14$  and 51% vs. 47% for oppositional defiant disorder,  $p = .07$ ; Table 4). Of 66 male subjects, 53% had ADHD, whereas of 34 female subjects 24% had ADHD ( $p = .005$  by chi-square).

#### Discussion

In a systematic evaluation of the effects of age upon the expression of clinical features of OCD, we found evidence of developmental heterogeneity in that specific correlates were associated with the disorder in different age groups. OCD in childhood and adolescence was male preponderant and associated with a higher frequency of aggression/catastrophe obsessions, hoarding and saving compulsions.



sions, multiple obsessions and compulsions, and poor insight compared with adult OCD. Sexual and religious obsessions were selectively more prevalent in adolescents compared with either children or adults. Children with OCD had higher rates of Tourette's disorder and separation anxiety disorder than older age groups, but mood disorders were similarly elevated in both adolescents and adults with OCD. Adults with OCD also had higher rates of substance use and eating disorders than either children or adolescents. These findings support a hypothesis of developmental discontinuity between juvenile and adult OCD and identify age specific correlates of the disorder across the life cycle.

The male preponderance and patterns of clinical correlates identified in pediatric and adult OCD are most consistent with our first hypothesis that postulates that juvenile (child and adolescent) and adult OCD are developmentally discontinuous. The preponderance of male over female subjects in juvenile OCD cases is consistent with the literature. Consistent with our results, most clinical studies of juvenile OCD have also found male predominance (Geller et al., 1995; Hanna, 1995; Last and Strauss, 1989; Riddle et al., 1990; Swedo et al., 1989; Thomsen, 1993; Toro et al., 1992). In contrast, both the ECA study (Karno et al., 1988) and Black's (1974) review of 11 adult studies of both OCD inpatients and outpatients encompassing 1336 subjects found a female preponderance (51.4%) in adult OCD subjects that, similar to our findings, indicates that gender distribution of OCD is developmentally sensitive. Whether the apparent interaction between gender and comorbid disruptive behavior disorders in our OCD youth accounts for this male predominance due to a higher rate of clinical referral in OCD boys is unknown and awaits population-based studies.

We also found that, compared with OCD adults, children and adolescents with OCD had higher rates of obsessive fears of loss or harm to loved ones or self, as well as increased rates of hoarding/saving compulsions. This finding provides further evidence for developmental variability in the phenotypic expression of the disorder. In addition, rates of separation anxiety disorder were inversely proportional to age and as high as 56% in childhood subjects. These findings may be understood in the context of attachment theory in that the expected developmental stages of attachment and independence could affect the clinical picture of OCD in children and adolescents. Further evidence of phenotypic developmental discontinuity was seen in our finding that rates of Tourette's syndrome (TS) were inversely proportional with age. For example, a decreasing rate of TS from childhood (25%) through adoles-

cence (9%) to adulthood (6%;  $p = .014$ ) was observed consistent with the declining course of TS from childhood to adulthood reported by others (Coffey et al., 2000; Spencer et al., 1999). A similar pattern was observed in rates of ADHD that were substantially higher in child OCD cases (51%) than in adolescent OCD cases (36%). However, because ADHD has not been systematically evaluated in adult OCD studies, the failure to identify ADHD in adults with OCD may be an error of omission and no firm conclusions can yet be drawn as to whether ADHD may represent a developmental marker of juvenile OCD. Research efforts aimed at recognition of ADHD in adult OCD subjects are needed.

Although we observed rates of comorbid major depression in adolescent OCD subjects that were similar to their adult OCD counterparts and significantly higher than in child subjects, rates of major depression are known to rise substantially in adolescence, and some authors have postulated that adolescent major depression may itself be discontinuous with adult-onset depression (Alpert et al., 1999; Orvaschel, 1990; Weissman et al., 1993). Thus, our findings that rates of depression alter significantly around puberty may not be entirely inconsistent with a developmental discontinuity hypothesis of OCD that postulates a juvenile subtype.

On the other hand, the many similarities in clinical features and patterns of comorbidity across all ages raise the critical question as to whether the differences observed represent true developmental subtypes of the disorder, which may have different etiologies. Delineating such subtypes would be essential for clarifying the causes of OCD in any age group. To do so would require data more proximal to etiology (*e.g.*, neuroimaging or genetic data). Such data are needed because our clinical results may simply reflect developmentally variable manifestations of a single disorder across the life cycle. For example, although we found that children with OCD more often had poor insight compared with adolescents with OCD, insight is developmentally sensitive; children may have a limited ability to cognitively process their obsessional ideation, self-evaluate their compulsive behavior, or adequately articulate their OCD symptoms. In a similar vein, adolescents had selectively higher rates of sexual and religious obsessions. Because sexual and religious preoccupations are prominent in adolescents, these findings suggest that OCD symptoms follow themes and conflicts appropriate to developmental stages. Likewise, our findings documenting higher rates of eating disorders and substance use disorders in adult compared with juvenile OCD subjects are consistent with developmental differences between

juveniles and adults because these disorders tend to emerge in late adolescence and young adult years.

The findings reported here should be interpreted in light of several methodological limitations. Because the sample consisted of children referred to a specialized pediatric OCD program, they may not generalize to community samples or to other mental health clinics; however, they should generalize to other specialty clinic samples. Our findings derived from structured diagnostic interview data collected from interviews with the mothers. Because diagnostic information relied on the epidemiological version of the K-SADS, whether additional information would have been obtained using the clinical version of this instrument (K-SADS-PL) remains unknown. Although the lack of direct structured interviews with the children may have decreased the sensitivity of the evaluation, studies of interview techniques for children indicate that children may not always be good informants of their lifetime psychopathology (Schwab-Stone et al., 1994). Moreover, all children also had the benefit of direct clinical assessment and diagnostic confirmation of OCD and other psychiatric disorders by a board-certified child psychiatrist and OCD specialist (DG) supporting the validity of maternal structured interview reports. Although precision and reliability in the dating of symptom onset diminishes with time (Angold et al., 1996), this should not materially affect our results based on the sample stratification before and after age 12 years. Nevertheless, more work with longitudinally ascertained samples may help clarify some of these issues. Also, we compared child and adolescent OCD cases with adult OCD data that had been previously published by another research group. This may have confounded our comparisons of adults and non-adults with unknown site differences in recruitment or assessment methods. Thus, our results should be replicated within a single study to provide more assurance of their validity.

Despite these limitations, we found evidence for important developmental variability in the expression of OCD across the life cycle that supports a hypothesis of developmental discontinuity between juvenile and adult OCD. Our data also show that within the pediatric years common developmental themes color and inform the clinical picture of OCD producing some age-specific phenotypic variability. More work is needed to determine whether observed developmental differences represent true subtypes of OCD. But, regardless of the outcome of that work, age and development should be important considerations in research and clinical studies of OCD to assure that diagnoses are developmentally sensitive and research

results are interpreted within the context of known developmental variability.

## REFERENCES

- Alpert JE, Fava M, Uebelacker LA, Nierenberg AA, Pava JA, Rosenbaum JF (1999) Patterns of comorbidity in early-onset vs. late-onset major depressive disorder: axis I disorders. *Biological Psychiatry* 46:202–211.
- Angold A, Erkanli A, Costello EJ, Rutter M (1996) Precision, reliability, and accuracy in the dating of symptom onsets in child and adolescent psychopathology. *J Child Psychol Psychiatry* 37:657–664.
- Black A (1974) The Natural History of Obsessional Neurosis. In H Beech (Ed), *Obsessional states* (pp 1–23). London: Methuen and Company, Ltd.
- Coffey B, Biederman J, Geller D, Spencer T, Park K, Shapiro S, Garfield S (2000) The course of Tourette's disorder: A literature review. *Harv Rev Psychiatry* 8:192–198.
- Geller D, Biederman J, Griffin S, Jones J, Lefkowitz TR (1996) Comorbidity of juvenile obsessive-compulsive disorder with disruptive behavior disorders. *J Am Acad Child Adolesc Psychiatry* 35:1637–1646.
- Geller D, Biederman J, Jones J, Park K, Schwartz S, Coffey B (1998) Is juvenile obsessive compulsive disorder a developmental subtype of the disorder? A review of the pediatric literature. *J Am Acad Child Adolesc Psychiatry* 37:420–427.
- Geller D, Biederman J, Reed E, Spencer T, Wilens T (1995) Similarities in response to fluoxetine in the treatment of children and adolescents with obsessive-compulsive disorder. *J Am Acad Child Adolesc Psychiatry* 34:36–44.
- Goodman WK, Price LH, Rasmussen SA, Mazure C, Delgado P, Heninger GR, Charney DS (1989a) Yale-Brown Obsessive Compulsive Scale (Y-BOCS): Part II. Validity. *Arch Gen Psychiatry* 46:1012–1016.
- Goodman WK, Price LH, Rasmussen SA, Mazure C, Fleischmann RL, Hill CL, Heninger GR, Charney DS (1989b) Yale-Brown Obsessive Compulsive Scale (Y-BOCS): Part I. Development, use, and reliability. *Arch Gen Psychiatry* 46:1006–1011.
- Hanna GL (1995) Demographic and clinical features of obsessive-compulsive disorder in children and adolescents. *J Am Acad Child Adolesc Psychiatry* 34:19–27.
- Karno M, Golding J, Sorenson S, Burnam A (1988) The epidemiology of obsessive-compulsive disorder in five U.S. communities. *Arch Gen Psychiatry* 45:1094–1099.
- Last CG, Strauss CC (1989) Obsessive-compulsive disorder in childhood. *J Anxiety Disord* 3:295–302.
- Leckman J, Sholomskas D, Thompson W, Belanger A, Weissman M (1982) Best estimate of lifetime psychiatric diagnosis: A methodological study. *Arch Gen Psychiatry* 39:879–883.
- Orvaschel H (1990) Early onset psychiatric disorder in high risk children and increased familial morbidity. *J Am Acad Child Adolesc Psychiatry* 29:184–188.
- Orvaschel H, Puig-Antich J (1987) *Schedule for Affective Disorders and Schizophrenia for School-Age Children: Epidemiologic 4th version*. Ft. Lauderdale, FL: Nova University, Center for Psychological Study.
- Rasmussen SA, Eisen JL (1998) Epidemiology and clinical features of obsessive compulsive disorders. In MA Jenike, L Baer, WE Minichiello (Eds), *Obsessive compulsive disorders: Practical management* (3rd ed, pp 12–43). St. Louis, MO: Mosby.
- Riddle M, Scahill L, King R, Hardin M, Towbin K, Ort S, Leckman J, Cohen D (1990) Obsessive compulsive disorder in children and adolescents: Phenomenology and family history. *J Am Acad Child Adolesc Psychiatry* 29:766–772.
- Scahill L, Riddle M, McSwiggin-Hardin M, Ort SI, King RA, Goodman WK, Cicchetti D, Leckman JF (1997) Children's Yale-Brown Obsessive Compulsive Scale: Reliability and validity. *J Am Acad Child Adolesc Psychiatry* 36:844–852.
- Schwab-Stone M, Fallon T, Briggs M, Crowther B (1994) Reliability of diagnostic reporting for children aged 6–11 years: A

- test-retest study of the diagnostic interview schedule for children—revised. *Am J Psychiatry* 151:1048–1054.
- Spencer T, Biederman J, Coffey B, Geller D, Wilens T, Faraone S (1999) The 4-year course of tic disorders in boys with attention-deficit/hyperactivity disorder. *Arch Gen Psychiatry* 56:794–847.
- Swedo S, Rapoport J, Leonard H, Lenane M, Cheslow D (1989) Obsessive-compulsive disorder in children and adolescents: Clinical phenomenology of 70 consecutive cases. *Arch Gen Psychiatry* 46:335–341.
- Thomsen P (1993) Obsessive-compulsive disorder in children and adolescents: Self-reported obsessive-compulsive behaviour in pupils in Denmark. *Acta Psychiatr Scand* 88:212–217.
- Toro J, Cervera M, Osejo E, Salamero M (1992) Obsessive-compulsive disorder in childhood and adolescence: A clinical study. *J Child Psychol Psychiatry Allied Disciplines* 33:1025–1037.
- Weissman M, Wickramaratne P, Adams P, Lish J, Horwath E, Charney D, Woods S, Leeman E, Frosch E (1993) The relationship between panic disorder and major depression: A new family study. *Arch Gen Psychiatry* 50:767–781.