Obsessive–Compulsive Disorder Across the Developmental Trajectory: Clinical Correlates in Children, Adolescents and Adults

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Previous research examining the clinical phenomenology of obsessive–compulsive disorder (OCD) has provided some evidence that OCD might be associated with different clinical correlates at different stages of development. In particular, there appears to be a bimodal distribution in terms of the age of onset of the disorder, a male predominance during childhood and adolescence compared to adulthood, stronger familial aggregation of OCD in early onset cases, and differences in the types of symptoms and the patterns of comorbidity across age groups. This study assessed the continuity in clinical presentation of OCD across three distinct age groups: children, adolescents and adults. It was hypothesised that the sample of children would be predominantly male, and would have a higher familial aggregation of OCD and/or anxiety/depression in first-degree relatives. It was further hypothesised that there would be significant age-related differences in terms of specific symptoms, patterns of comorbidity, OCD severity, functional impairment, and level of insight and distress. The results of this study support the developmental heterogeneity hypothesis, with significant differences occurring across age groups on a number of clinical features of OCD including age at onset, symptoms experienced, comorbidity, severity, insight and impairment. Implications of the findings and future directions for research in this area are discussed.

Obsessive–compulsive disorder (OCD) affects as many as 2% to 3% of children (Rapoport et al., 2000; Zohar, 1999), suggesting childhood OCD is at least as prevalent as adult OCD (Degonda, Wyss, & Angst, 1993; Flament et al., 1988; Karno, Golding, Sorenson, & Burman, 1988; Vallen-Basile et al., 1994). OCD in adulthood is frequently associated with impairment in general functioning, with disruptions to gainful employment (Leon, Portera, & Weissman, 1995), as well as marital and interpersonal difficulties (Emmelkamp, de Hann, & Hoogduin, 1990; Riggs, Hiss, & Foa, 1992). Similarly, childhood OCD is associated with impaired school performance (Toro, Cervera, Osejo, & Salamero, 1992), poor peer relationships (Allsopp & Verduyn, 1990), and disruption to family life (Calvocoressi et al., 1995; Cooper, 1996).

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The remarkable similarities in clinical phenomenology between childhood and adult OCD have guided researchers to assume that OCD is a continuous disorder, with little or no variation in the clinical presentation across age groups. Research over the past decade provides evidence to suggest that a number of inconsistencies exist between the clinical presentation of childhood OCD and adult OCD, which raises questions about the continuity of the clinical presentation of OCD across the lifespan (e.g., Geller et al., 1998).

Studies consistently report the onset of juvenile OCD between ages 8 and 11 years (Allsop & Verduyn, 1990; Hanna, 1995; Rapoport, Swedo, & Leonard, 1992; Riddle et al., 1990), whereas in adult studies the mean age of onset is typically around 21 years (Minichiello, Baer, Jenike, & Holland, 1990; Pauls, Alsobrook, Goodman, Rasmussen, & Leckman, 1995; Rasmussen & Eisen, 1992), suggesting there may be a bimodal incidence pattern across the developmental trajectory. There may also be variation across gender in age of onset, with boys more likely to have prepubertal onset and girls more likely to have a pubertal or adolescent onset. Most studies note a male predominance in children (2:1), with the gender distribution becoming more equal in adolescence (Hanna, 1995; Swedo, Rapoport, Leonard, Lenane, & Cheslow, 1989). In adult samples there tends to be an equal gender distribution or possibly even a slight female predominance (Karno et al., 1988).

Research has shown possible age-related differences in terms of comorbidity associated with OCD. Although comorbid depression is common in juvenile OCD, with prevalence rates ranging from 20% to 73% (Flament et al., 1990; Geller, Beiderman, Griffin, Jones, & Lefkowitz, 1996), Geller et al. (2001a) found that comorbid major depression was significantly more prevalent in adults than juveniles. Tourette syndrome and tics also frequently co-occur with OCD; however, they tend to occur more so in children than in adolescents and adults (Geller et al., 2001a). In terms of disruptive behavioural disorders, some studies report relatively low rates of co-occurrence (i.e., 10% of children; Swedo et al., 1992; Thomsen, 1994), while others (Geller et al., 2001a, 2001b, 1996) report co-occurrence of OCD and disruptive behaviour disorders as high as 57% for children and 47% for adolescents, with non-existent rates of comorbidity in adult samples (Geller et al., 2001a). Geller et al. (2001b) suggest that the significantly lower rates of comorbidity found in other child samples might be the result of strict exclusion criteria used in treatment studies that frequently exclude children with comorbid Tourette syndrome, which is often associated with ADHD. In adults, the occurrence of substance abuse/dependence and eating disorders is more frequent than in children or adolescents (Geller et al., 2001a).

In the only study to date examining clinical correlates of OCD across age groups, Geller et al. (2001a) found that children, adolescents and adults vary in the types of symptoms that are experienced. In this study, children and adolescents displayed more aggressive obsessions than adults, children experienced fewer sexual obsessions than adolescents and adults, adolescents reported more religious obsessions than both children and adults, and children reported more hoarding compulsions than adolescents and adults (Geller et al., 2001a).

Although it is widely recognised that OCD tends to run in families, research suggests that there might be a stronger familial trend associated with early onset OCD than with adult onset OCD. Nesdadt et al. (2000) compared the prevalence of OCD in the first-degree relatives of 80 OCD patients and 73 community controls. The

relatives of the OCD patients were found to have higher rates of OCD compared to relatives of the controls (i.e., 11.7% in comparison to 2.7%). Furthermore, age of onset of OCD was strongly related to the familial trend. The prevalence of OCD in relatives of patients who had early onset OCD (i.e., onset between the ages of 5 and 17 years) was 13.8%. In comparison, for patients who had late onset OCD (i.e., 18 to 41 years), there were no cases reported of relatives with OCD.

In sum, this research provides some evidence that OCD might be associated with different clinical correlates at different ages. This study aims to assess the continuity of OCD across three distinct age groups of treatment-seeking clients. This is the first study that examines cross-sectional clinical correlates of OCD using data from children, adolescents and adults collected by the same research group and using parallel measures of assessment across age groups.

Based on the research reviewed, it was hypothesised that the sample of children would be predominantly male and would have a higher familial aggregation of OCD in first-degree relatives. It was also of interest to examine familial anxiety and depression, given that OCD co-occurs so frequently with other anxiety and depressive disorders. So, it was hypothesised that there would be differences across age groups in terms of specific patterns of comorbidity. And finally, given that children and adolescents are faced with different social, emotional and cognitive developmental demands, it was hypothesised that there may be age-related differences in terms of OCD severity, functional impairment, levels of insight and distress, and specific OCD symptoms. In sum, it was hypothesised that the clinical phenomenology associated with OCD would be discontinuous across the developmental trajectory.

Method

Participants

Children and adolescents aged between 6 and 17 years were recruited through community referrals and media announcements as part of a controlled treatment trial of cognitive-behavioural therapy (CBT) being run at Griffith University (Barrett, Healy, & March, 2004). For involvement in this study, adults were recruited through co-joint advertising with the treatment study and were also offered free CBT following an assessment phase. Children, adolescents and adults were selected into this study on the basis of a primary diagnosis of OCD as per the fourth edition of the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-IV; American Psychiatric Association, 1994).

As a requirement of the treatment trial there were exclusionary criteria, including primary major depression or another primary anxiety disorder (in the absence of co-primary OCD), externalising disorders (in the absence of co-primary OCD), Tourette syndrome (comorbid tics or tic disorders were acceptable), autistic spectrum disorder (ASD), schizophrenia, organic mental disorder, mental retardation and concurrent involvement in other psychological treatment. Exclusionary criteria for the adult sample matched the criteria for the child treatment trial. There were no other criteria for inclusion/exclusion. The sample for this study consisted of 40 children aged 6 to 11 years ($M = 9.43$, $SD = 1.60$), 44 adolescents aged 12 to 17 years ($M = 14.00$, $SD = 1.64$), and 41 adults aged 18 to 66 years ($M = 32.10$, $SD = 12.23$).

Measures

Anxiety Disorders Interview Schedule for DSM-IV (Parent and Adult Versions)

The Anxiety Disorders Interview Schedule for DSM-IV Parent Version (ADIS-P; Silverman & Albano, 1996) and Adult Version (ADIS-Adult; Brown, DiNardo, & Barlow, 1994) were used. The ADIS-P is a semi-structured interview designed specifically to diagnose anxiety disorders in children and adolescents and to differentiate these from other internalising and externalising disorders (Silverman & Eisen, 1992). Similarly, the ADIS-Adult was developed to establish reliable diagnosis of the DSM-IV (American Psychiatric Association, 1994) anxiety, mood, somatoform and substance-use disorders, and to screen for the presence of other conditions such as psychotic disorders.

The ADIS includes interference ratings ranging from 0 (*no interference*) to 8 (*severely disabling*). To meet DSM-IV (American Psychiatric Association, 1994) criteria for a clinical diagnosis, symptoms for any given diagnostic category were required to have an interference rating of 4 (*definitely disabling*) or higher (*clinical diagnoses*). The principal diagnosis was the one that received the highest interference rating. ADIS-P interviews were conducted with parents alone, which in the majority of cases involved mothers only. A few fathers were also present; however, there were no cases of disagreement between parents on the presence of a diagnostic category. ADIS-Adult interviews were conducted with the adult OCD client.

Studies that have examined the psychometric properties of the ADIS-P have shown excellent interrater reliability (i.e., $r = .93$; Silverman & Nelles, 1988), good retest reliability (i.e., $r = .67$ over a 10- to 14-day period; Silverman & Eisen, 1992) and good construct validity (Tracey, Chorpita, Douban, & Barlow, 1997). Likewise, the ADIS-Adult has demonstrated good to excellent interrater reliability across the majority of diagnostic categories (i.e., $r = .67$ for major depressive disorder [MDD] to $.86$ for specific phobia; Brown, DiNardo, Lehman, & Campbell, 2001).

All diagnostic interviews were videotaped, and interrater reliability across diagnostic categories was conducted for 25% of all ADIS-P and ADIS-Adult interviews using the kappa statistic. For the ADIS-P interviews, reliability ranged from adequate agreement (i.e., $\kappa = 0.63$ for social phobia; $\kappa = 0.86$ for generalised anxiety disorder [GAD]) to excellent agreement (i.e., $\kappa = 1.00$ for all other diagnostic categories including OCD), with the overall mean kappa indicating excellent interrater agreement ($\kappa = 0.96$). For the ADIS-Adult interviews, interrater reliability ranged from adequate (i.e., $\kappa = 0.62$ for social phobia and GAD; $\kappa = 0.74$ for MDD) to excellent agreement (i.e., $\kappa = 1.00$ for all other diagnostic categories including OCD), with the overall mean kappa for diagnostic reliability being 0.89, indicating excellent interrater reliability. In cases of disagreement between raters, the two clinicians reviewed the interview together and assigned a consensus diagnosis.

Children's Yale-Brown Obsessive-Compulsive Scale and Yale-Brown Obsessive-Compulsive Scale

The Children's Yale-Brown Obsessive-Compulsive Scale (CY-BOCS; Scahill et al., 1997) and the Yale-Brown Obsessive-Compulsive Scale (Y-BOCS; Goodman et al., 1989a) were used. The C/Y-BOCS is a widely used, clinician-rated, semistructured interview that assesses severity of obsessions and compulsions across five scales — (a) time occupied by symptoms, (b) interference, (c) distress, (d) resistance, and

(e) degree of control over symptoms — and also provides a total severity score. Ratings are made on 5-point Likert scales, ranging from 0 (*no symptoms*) to 4 (*extreme symptoms*), with total scores ranging from 0 to 40. Separate subtotals are calculated for severity of obsessions and compulsions. Cut-offs generally used in evaluating the C/Y-BOCS total score are (a) mild (10–18; distress but not necessarily functional impairment), (b) moderate (19–29; distress and functional impairment), and (c) severe (30 or above; severe distress and serious impairment; March & Mulle, 1998). The C/Y-BOCS includes another six items that assess insight, avoidance, indecisiveness, pathological responsibility, pathological slowness, and pathological doubting.

The CY-BOCS has demonstrated excellent internal consistency ($r = .87$), good to excellent interrater reliability ($r = .66$ to $.91$ across subscales), and good convergent and divergent validity (Scahill et al., 1997). The Y-BOCS also has good to excellent interrater reliability ($r = .86$ to $.98$) and internal consistency ($r = .88$ to $.91$), and the total score for the Y-BOCS has been shown to be significantly correlated with other measures of OCD severity (i.e., NIMH-OC, $r = .67$; CGI-OCS, $r = .74$) and weakly correlated with measures of depression and anxiety (Goodman et al., 1989a, 1989b).

Conners March Developmental Questionnaire

The Conners March Developmental Questionnaire (Conners & March, 1996) was originally developed as a clinic-demographic intake self-report assessment. It was used in this study as a semistructured interview to elicit detailed information regarding the history of OCD, including age at onset, triggering events, and family psychiatric history (including clinical or subclinical current/past OCD, anxiety and depression). The Conners March also includes standard demographic information related to family constellation, socioeconomic status, educational history, psychological and pharmacological treatment history, and medical history. An adult version was developed for use with adult clients in this study. The items included on the adult version were parallel to the child version. There have not been any psychometric studies conducted on the Conners March Developmental Questionnaire.

State Trait Anxiety Inventory

The State Trait Anxiety Inventory (STAI; Spielberger, Gorsuch, Lushene, Vagg, & Jacobs, 1983) and the State Trait Anxiety Inventory for Children (STAIC; Spielberger, Lushene, Montuori, & Platzek, 1973) were used. The STAI/C comprises two separate self-report scales that measure state anxiety (20 items) and trait anxiety (20 items). The STAIC responses are rated on a 3-point Likert scale ranging from 1 (*not at all*) to 3 (*very much*). For adults, the STAI rates state anxiety on a 4-point Likert scale ranging from 1 (*not at all*) to 4 (*very much so*). Given that the STAIC and STAI responses are rated on different scales, this study converted each participant's raw score to a t score based on the normative data for each age group and across gender (see inventory manuals for normative data; for the STAI see Spielberger et al., 1983; for the STAIC see Spielberger et al., 1973).

The STAIC is a widely used measure in clinical research with anxious children and has demonstrated good test–retest reliability ($r = .63$ to $.72$; Finch, Kendall, Montgomery, & Morris, 1975). Studies of test–retest reliability of the STAI have shown good to excellent reliability, with correlation coefficients ranging from $.65$ to $.86$ across a number of samples for trait anxiety scores (see Spielberger et al., 1983).

Beck Depression Inventory and Children's Depression Inventory

The Beck Depression Inventory (BDI; Beck, Rush, Shaw, & Emery, 1979) and the Children's Depression Inventory (CDI; Kovacs, 1992) were used. The BDI comprises 21 items assessing symptoms of depression, scored 0 (*absence of symptom*), 1 (*mild symptom*), 2 (*moderate symptom*), or 3 (*severe symptoms*), with higher scores indicating increasing severity and a total score that ranges from 0 to 63. The CDI consists of 27 items assessing depression on a scale from 0 (*no symptoms*) to 2 (*definite symptoms*), with total scores ranging from 0 to 54. Because the BDI and CDI differ in total number of items, as well as on rating scale, total raw scores were converted into *t* scores based on normative data sensitive to age and gender of each participant (see inventory manuals for normative data; for the BDI see Beck, Steer, & Brown, 1996; for the CDI see Kovacs, 1992).

The CDI has demonstrated good internal consistency ($r = .71$ to $.87$; Kovacs, 1983) and acceptable test-retest reliability, $r = .41$ (Smucker, Craighead, Craighead, & Green, 1986) and $r = .87$ (Saylor et al., 1984). The BDI has shown excellent internal consistency across both an outpatient sample ($r = .92$) and a sample of college students ($r = .93$; see Beck et al., 1996), and excellent test-retest reliability ($r = .93$; see Beck et al., 1996). The BDI has demonstrated adequate convergent validity and discriminant validity (see Beck et al., 1996).

Child OCD Impact Scale — Child/Adolescent Report and Adult OCD Impact Scale

The Child OCD Impact Scale — Child/Adolescent Report (COIS; Piacentini, Bergman, Keller, & McCracken, in press) and the Adult OCD Impact Scale (adapted from the COIS) were used. The COIS assesses the impact of OCD on psychosocial functioning. This measure includes 20 items, each across three domains, rated on a 4-point Likert scale, and has child and parent parallel forms. An adult version of the COIS was adapted by the author (LF) for use in the present investigation. The adult version parallels each item of the COIS with the following exception: items assessing school situations on the COIS were altered to cover contextually similar work-related situations. The COIS and Adult OCD Impact Scale assess three domains of impairment including school (child)/work (adult), social, and family/home. Four additional items assess the global impact of OCD on school/work, home, social, and going out. Studies using the COIS have shown excellent internal consistencies for the three subscales and the total score (range $r = .78$ to $.85$; Piacentini, Jaffer, Bergman, McCracken, & Keller, 2001), and good convergent validity between the COIS total score and the CY-BOCS ($r = .46$; Piacentini et al., 2001). Internal consistency was examined for the Adult OCD Impact Scale using data from the current study. Analysis revealed excellent internal consistency across all scales and the total score (i.e., work $r = .87$; social $r = .95$; home $r = .90$; total $r = .94$).

Procedure

Following referral to the university clinic, participants' eligibility for inclusion into this project was conducted via a screening interview over the telephone. Participants appearing eligible were invited into the clinic for diagnostic assessments. Written informed consent was obtained at the beginning of the clinic assessment. Clinically

trained postgraduate students blind to the hypotheses of the research conducted these interviews.

Following diagnostic interviews and C/Y-BOCS interviews, parents (for child and adolescent participants) and adult clients were interviewed using the Conner's March Developmental Questionnaire — or its adapted adult client version. While parents completed this interview, children were assisted to complete the self-report inventories. Adults completed these questionnaires, either directly after the interview or later at home, and returned them by post or at their next visit to the clinic (within a 2-week period).

Following these assessments, all children and adolescents who were eligible for inclusion in the treatment trial were randomly assigned to either individual or group CBT. All adult participants were also offered group CBT. Participants who were not eligible for inclusion in the treatment trial and/or this study were referred to either a community mental health clinic or the university psychology clinic for treatment.

Results

Analyses of between-subject comparisons across age groups were made using chi-square tests for categorical data, and one-way ANOVAs with Tukey's post-hoc tests for continuous data. Participant numbers varied across analyses due to missing data, typically the result of incomplete questionnaires, difficulties with recalling information for retrospective interview questions (such as age of onset), and/or parental refusal to disclose personal information (such as family history of psychiatric illness). Furthermore, the COIS and Adult OCD Impact Scale were not included in the original assessment protocol for this study, hence participant numbers on this measure are substantially lower.

Multiple comparisons were conducted across variables, which may potentially result in increased Type I error across analyses. Statisticians have traditionally agreed that controls for experiment-wise error rate should be invoked to ensure Type I error is controlled across multiple comparisons; however, more recently it has been argued that controlling for chance effects (e.g., using traditional Bonferroni methods) should not be routinely employed when sample sizes are small, as such controls further reduce statistical power and can increase Type II errors (Jaccard & Guilamo-Ramos, 2002). Therefore, at the risk of increased Type I error across comparisons, this study did not employ traditional Bonferroni methods.

Demographics, Onset, Family History and Comorbidity

Table 1 describes demographic data; onset of OCD data; family history of OCD, anxiety and depression; and comorbidity across age groups. Although there was no significant difference across groups on gender, the data show male predominance during childhood (58%), with a shift to female preponderance during adolescence (57%) and adulthood (63%). There were 23 males and 17 females in the child group, 19 males and 25 females in the adolescent group, and 15 males and 26 females in the adult group. Age of onset varied significantly across the three groups, $F(2, 94) = 71.68, p < .001$, with three distinct times of onset occurring at 7 years, 10 years and 21 years ($p < .05$). There was no difference across child, adolescent and adult groups for the number of participants experiencing precipitating events prior to onset (i.e., 74% vs. 67% vs. 73%). Of those who reported a precipitating event, 28% reported a school/work-related stressful event, 22% a reported family-related

TABLE 1**Demographics, Onset of Obsessive–Compulsive Disorder and Family History**

	Children		Adolescents		Adults		<i>p</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	
Age at onset	7.38	2.61	10.81	2.86	21.45	7.42	< .001 ^{a,b,c}
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>p</i>
Male	23	58	19	43	15	37	.16
Prec. Event	20	74	24	67	24	73	.78
Mother OCD	5	19	5	14	9	27	.35
Father OCD	2	7	5	14	7	21	.31
Mother Anx.	11	39	7	19	8	24	.17
Mother Dep.	6	21	8	22	11	33	.45
Father Anx.	5	19	6	16	7	21	.87
Father Dep.	4	15	6	16	2	6	.39
Sibling OCD	1	4	4	11	4	12	.49
Sibling Anx.	6	22	6	16	7	21	.80
Sibling Dep.	1	4	2	4	7	21	< .05 ^{b,c}
<i>Comorbidity</i>							
ODD	6	15	1	2	—	—	< .01 ^a
ADD/ADHD	4	10	1	2	—	—	.14
SAD	9	23	7	16	—	—	.44
Social	7	18	10	23	16	39	.07
Specific	19	48	11	25	8	20	< .05 ^{a,b}
Panic	1	3	0	0	6	15	< .01 ^{b,c}
Agoraphobia	0	0	0	0	2	5	.13
GAD	19	48	21	48	18	44	.93
PTSD	1	3	0	0	1	2	.58
MDD	0	0	2	5	8	20	< .005 ^{b,c}
Dysthymia	4	10	4	9	4	10	.10
Tics	13	39	10	27	3	9	< .05 ^{b,c}

Note: onset = age when symptoms became obvious and represented problem

precipitating event = precipitating event associated with OCD onset

mother/father/sibling OCD = current/past history of clinical/subclinical OCD

mother/father/sibling anxiety = current/past anxiety diagnosis or symptoms

mother/father/sibling depression = current/past depression diagnosis or symptoms

ODD = oppositional defiant disorder

ADD/ADHD = attention-deficit disorder/attention-deficit/hyperactivity disorder

SAD = separation anxiety disorder

Social = social phobia

Specific = specific phobia

Panic = panic disorder

GAD = generalised anxiety disorder

PTSD = posttraumatic stress disorder

MDD = major depressive disorder

^aSignificance between children and adolescents ($p < .05$)^bSignificance between children and adults ($p < .05$)^cSignificance between adolescents and adults ($p < .05$)

stressor, 16% reported illness or injury to self or others, 15% reported death of a family member or friend, and the remaining 15% reported another unspecified type of event prior to onset.

There were no differences across groups on mother or father psychiatric history. There were group differences on sibling history of depression, $\chi^2(2, 97) = 0.258, p < .05$, with children and adolescents having significantly fewer siblings with current or past symptoms of depression ($p < .05$) in comparison to adult clients.

Given that adults were not assessed for childhood disorders of separation anxiety disorder (SAD), oppositional defiant disorder (ODD) or attention-deficit disorder (ADD)/attention-deficit/hyperactivity disorder (ADHD), as ADIS-Adult does not include these diagnostic categories, these categories could only be analysed across children and adolescents. There were significant age group differences on diagnoses of ODD, $\chi^2(1, 84) = 4.44, p < .01$; specific phobia, $\chi^2(2, 125) = 0.26, p < .05$; panic disorder, $\chi^2(2, 125) = 0.28, p < .01$; MDD, $\chi^2(2, 125) = 0.30, p < .005$; and the presence of vocal and/or motor tics, $\chi^2(2, 103) = 0.28, p < .05$. Children experienced significantly higher rates of ODD diagnoses in comparison to adolescents ($p < .05$). Children also experienced comorbid specific phobia significantly more often than adolescents and adults ($p < .05$). Adults were diagnosed with panic disorder and MDD at a significantly higher rate than both children and adolescents ($p < .05$). And finally, children and adolescents experienced significantly higher rates of motor and/or vocal tics in comparison to adults ($p < .05$).

Obsessive–Compulsive Disorder Symptoms and Symptom Characteristics

Table 2 displays the frequency of specific obsessions and compulsions, group means and standard deviations for C/Y-BOCS subscales and total scores, depression and anxiety t scores, and OCD impact scores across age groups. In the majority of cases, children, adolescents and adults similarly reported both multiple obsessions (i.e., 92% vs. 98% vs. 98%) and multiple compulsions (i.e., 95% vs. 100% vs. 98%). Groups differed in the frequency of reported contamination obsessions, $\chi^2(2, 123) = 0.251, p < .05$; sexual obsessions, $\chi^2(2, 123) = 0.252, p < .05$; and somatic obsessions, $\chi^2(2, 123) = 0.250, p < .05$. Adolescents had significantly higher rates of contamination obsessions in comparison to both children and adults, who did not differ from each other ($p < .05$). Children reported significantly fewer sexual obsessions and somatic obsessions in comparison to adults ($p < .05$).

Groups were also significantly different in the frequency of reported washing compulsions, $\chi^2(2, 123) = 0.351, p < .05$, and checking compulsions, $\chi^2(2, 123) = 0.301, p < .05$. Adolescents reported higher rates of washing compulsions in comparison to both children and adults, who did not differ from each other ($p < .05$). Children also reported significantly fewer checking rituals than both adolescents and adults ($p < .05$).

There were significant differences across age groups on mean C/Y-BOCS severity scores for obsessions, $F(2, 121) = 6.57, p < .005$; compulsions, $F(2, 121) = 10.35, p < .001$; and total scores, $F(2, 121) = 9.73, p < .001$. Children and adolescents, who did not differ in severity of OCD, were rated significantly less severe on obsessions, compulsions, and total C/Y-BOCS scores in comparison to adults ($p < .05$).

On the C/Y-BOCS subscales, groups differed significantly on clinician ratings of insight, $F(2, 121) = 8.76, p < .001$; avoidance, $F(2, 121) = 5.26, p < .01$; indecisiveness, $F(2, 121) = 3.95, p < .05$; pathological responsibility, $F(2, 121) = 4.97, p < .01$; and pathological doubting, $F(2, 121) = 12.69, p < .001$. Children and adolescents

TABLE 2
OCD Symptoms and Symptom Characteristics Across Age Groups

	Children (<i>n</i> = 39)		Adolescents (<i>n</i> = 43)		Adults (<i>n</i> = 41)		
Symptom	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>p</i>
Obsessions							
Multiple Ob.	36	92	42	98	40	98	.38
Contamination	27	69	40	93	31	76	< .05 ^{a,c}
Aggressive	29	74	37	86	33	81	.41
Sexual	3	8	7	16	13	32	< .05 ^b
Hoarding	11	28	19	42	21	51	.10
Superstitious	9	23	15	35	10	24	.42
Somatic	11	28	21	49	24	59	< .05 ^b
Religious	13	33	23	54	18	44	.19
Miscellaneous	21	54	24	56	28	68	.36
Compulsions							
Multiple Com.	37	95	43	100	40	98	.32
Washing	19	49	38	88	26	63	< .005 ^{a,c}
Checking	25	64	38	88	39	90	< .005 ^{a,b}
Repeating	21	54	31	72	29	71	.16
Counting	12	31	19	44	22	54	.12
Ordering	20	51	18	42	24	59	.31
Hoarding	16	41	19	44	20	49	.78
Superstitious	12	31	15	35	15	37	.85
Reassurance	20	51	27	63	26	63	.46
Miscellaneous	30	77	39	91	38	93	.08
		(<i>n</i> = 40)					(<i>n</i> = 40)
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>p</i>
YBOCS ob.	10.48	4.06	11.32	3.37	13.60	4.53	< .005 ^{b,c}
YBOCS com.	11.13	4.03	11.09	3.77	14.50	3.86	< .001 ^{b,c}
YBOCS total	21.60	7.15	22.41	6.38	28.08	8.02	< .001 ^{b,c}
Insight	1.65	0.95	1.43	0.79	0.93	0.62	< .001 ^{b,c}
Avoidance	1.18	0.96	1.55	0.95	1.93	1.19	< .01 ^b
Indecisiveness	1.20	1.02	1.41	1.21	1.90	1.19	< .05 ^b
Responsibility	1.10	0.90	1.43	1.09	1.85	1.19	< .01 ^b
Slowness	1.27	1.68	1.09	0.98	1.70	1.20	.10
Doubting	1.02	0.80	1.73	1.21	2.23	1.14	< .001 ^{a,b}
Depression	47.84	12.40	50.77	11.31	51.97	10.93	.324
Anxiety	43.36	10.10	53.65	14.14	69.83	12.36	< .001 ^{a,b,c}
Impact — voc.	7.30	5.98	11.46	12.13	11.50	9.66	.265
Impact — soc.	7.15	7.73	10.96	9.88	17.76	14.09	< .005 ^b
Impact — fam.	9.00	6.80	13.33	11.66	13.58	11.21	.261

TABLE 2 (continued)

Note: n = number of participants who endorsed *at least* one symptom from each of those listed

C/Y-BOCS symptom subtypes

multiple ob. = multiple obsessions

multiple comp. = multiple compulsions

YBOCS ob. = total obsession subscale score from C/Y-BOCS

YBOCS com. = total compulsion subscale score from C/Y-BOCS

Ratings of insight, avoidance, indecisiveness, responsibility, slowness and doubting based on clinical judgment from C/Y-BOCS interview.

Depression = mean t score derived from normative data sensitive to age and gender

Anxiety = mean t score derived from normative data sensitive to age and gender

Impact — voc. = OCD Impact Scale school/work scale

Impact — soc. = OCD Impact Scale social scale

Impact — fam. = OCD Impact Scale home/family scale

*Significance between children and adolescents ($p < .05$)

^bSignificance between children and adults ($p < .05$)

^cSignificance between adolescents and adults ($p < .05$)

displayed significantly less insight in comparison to adults ($p < .05$). Children displayed significantly less avoidance, indecisiveness, and responsibility in comparison to adults ($p < .05$). Children further displayed significantly less doubt than both adolescents and adults ($p < .05$). There were no group differences on C/Y-BOCS ratings of slowness.

Although the age groups did not differ on self-reported levels of depression, there were significant group differences across self-reported levels of trait anxiety based on t scores derived from normative data across gender and age categories, $F(2, 111) = 42.95$, $p < .001$. Post-hoc tests revealed that children displayed significantly less anxiety than adolescents and adults and, furthermore, that adolescents displayed significantly less anxiety in comparison to adults ($p < .05$).

Groups also differed in the degree of functional impairment experienced across social settings, $F(2, 74) = 5.82$, $p < .005$. Post-hoc tests illustrated that children experienced significantly less social impairment as a result of OCD in comparison to adults ($p < .05$). There were no other differences across groups on functional impairment.

Discussion

This study evaluated the clinical correlates of OCD across three distinct age groups. The results support the developmental heterogeneity hypothesis, with significant differences occurring across age groups on a number of clinical features of OCD, suggesting that OCD might present as specific developmental subtypes at different ages.

The majority of significant differences across groups on clinical features of OCD occurred between children and adults, with adolescents sharing some similar features of both groups. Children presented as different from both adolescents and adults in that there was a nonsignificant male predominance in the sample (i.e., 58% vs. 43%, vs. 37%), earlier age of onset, higher comorbidity with ODD and specific phobia, less checking rituals, less pathological doubting, and less trait anxiety. Children differed significantly from adults, but not so from adolescents, in experiencing significantly fewer sexual and somatic obsessions, less social impairment, and less avoidance, indecisiveness, and pathological responsibility. Children and adolescents presented with childhood disorders of ODD, ADD/ADHD and SAD, which were not assessed in the adult sample. ADD/ADHD and SAD occurred at similar rates across the child and adolescent samples; however, ODD was experienced more

frequently by children and adolescents. Children and adolescents also differed significantly from adults in displaying less insight and higher comorbidity with specific phobia and tics.

Adults reported significantly later onset of OCD; were significantly more severe across obsessions, compulsions and overall impairment (as measured by C/Y-BOCS) in comparison to both children and adolescents; and they reported higher comorbidity with panic disorder and MDD. Adolescents differed from both children and adults only by having onset in later childhood and by experiencing significantly higher frequencies of contamination obsessions and washing rituals. While adolescents experienced less trait anxiety than adults, they reported significantly higher anxiety in comparison to children. Taken together, these results suggest childhood and adult OCD are quite distinct in terms of the clinical features, severity, and patterns of comorbidity. OCD in adolescence, however, is less unique and shares some features of both childhood and adult OCD, suggesting that, at this developmental stage, OCD is in transition from the clinical presentation of childhood to the clinical presentation typical during adulthood.

The majority of findings are largely consistent with previous research, in particular results found by Geller et al. (2001a); however, the results did not support the hypothesis of developmental differences in familial aggregation of OCD or its related psychopathology (i.e., anxiety and/or depression). There were no differences in rates of subclinical or clinical OCD, anxiety or depression in relatives of OCD participants across the three age groups. Consistent with Nesdadt et al. (2000), relatives of OCD participants across all age groups were reported to experience high rates of OCD symptoms or disorder (i.e., 4% to 27% of the sample had a relative with OCD symptoms or disorder). Also of note in this study is that parents and siblings across all age groups consistently reported symptoms or diagnoses of anxiety and/or depression. This finding lends support to previous research demonstrating the negative impact that OCD has on family members (i.e., Barrett, Rasmussen, & Healy, 2001; Calvocoressi et al., 1995; Cooper, 1996) or, alternatively, provides further evidence for high familial aggregation of psychopathology in relatives of patients with OCD. However, the failure of this study to detect group differences in familial prevalence of OCD should be interpreted cautiously and may, instead, result from response bias of parents (i.e., withholding this information), incomplete assessment (i.e., no systematic diagnostic evaluation conducted), or preliminary evidence suggesting continuity of familial aggregation in relatives of participants with OCD.

In terms of the types of symptoms experienced, the present study provides some evidence for developmental discontinuity across age. Group differences on sexual obsessions and checking compulsions may be explained by developmentally sensitive themes that correspond to specific age groups. For example, sexual preoccupations may begin to develop in adolescence; and checking may become prominent with responsibility for one's own significant possessions, typically associated with adulthood. Accounting for group differences on other symptoms seems to go beyond an explanation of the relevant themes of preoccupation across specific ages, rather suggesting that OCD presents with distinct themes at different ages, again providing support for the heterogeneity hypothesis.

In terms of comorbidity, the results of the present study are also largely consistent with previous research. As found in the study by Geller et al. (2001a), childhood and adolescent OCD co-occurred with disruptive behavioural disorders (i.e., ODD and ADD/ADHD) and SAD. These disorders were not assessed in adults,

given that they are defined as childhood disorders and are not included as diagnostic categories in the ADIS-Adult. Interestingly, ODD occurred more highly in children than adolescents, and specific phobia occurred more highly in children compared with both adolescents and adults. Motor and vocal tics were also more prevalent in the child and adolescent sample than the adult sample. These results are not surprising, given the developmental nature of these disorders and their generally higher prevalence among youngsters as compared to older individuals in the general population. Rates of ADD/ADHD were not as high in this study as those reported in the Geller et al. (2001a) study; however, they were consistent with the lower rates reported in previous studies by other research groups (i.e., Swedo et al., 1992; Thomsen, 1994). The lower prevalence rate of ADD/ADHD found in this study may have been the result of the exclusion criteria for Tourette syndrome, as argued by Geller et al. (2001b), or it might reflect accurate comorbidity within a sample of 'pure' OCD children and adolescents; that is, a sample of OCD participants not contaminated with children who actually have primary Tourette syndrome and not primary OCD. Also consistent with the Geller et al. (2001a) study, adults experienced comorbid MDD and panic at higher rates than youngsters in this study. These findings are not surprising, given that each of these comorbid disorders is more prevalent at the corresponding developmental stages, regardless of comorbidity with OCD. What these results do suggest, however, is that OCD co-occurs with different disorders at different stages of development, which inadvertently will effect the presentation of the disorder, the impact of the disorder on the client's life, and ultimately, the treatment planning and delivery.

Of particular note in this study is the finding that OCD becomes increasingly more severe across the developmental trajectory. During childhood, there is significantly less anxiety, severity of obsessions and compulsions, avoidance, indecisiveness, pathological responsibility and social impairment, compared to adulthood. However, in our adolescent sample, these symptoms escalated in severity/intensity, with results from this study demonstrating that adolescents do not differ significantly from adults across these variables (with the exception of anxiety). These results, taken together with research which indicates that as many as one third to one half of adults report onset of OCD during childhood (Rasmussen & Eisen, 1990), highlight the persistent nature of OCD and the deteriorating course for the sufferer across the developmental trajectory. This research emphasises the need for accurate and early identification of OCD during childhood, so that effective and developmentally sensitive interventions can be offered prior to the development of the increased severity and impairment associated with OCD during adulthood.

The present study examined clinical correlates of OCD across the developmental trajectory using data from children, adolescents and adults collected by the same research group and using parallel measures of assessment across age groups wherever possible. Reliable and valid measures of assessment were used, and interrater reliability for diagnostic assessments indicated excellent agreement between raters. This study used inclusion and exclusion criteria based on associated comorbidity to ensure the integrity of the sample in terms of primary OCD diagnosis. Inclusion of comorbid disruptive behaviour disorders allowed for an examination of the prevalence of this pattern of comorbidity across age groups, which has been the issue of debate in previous studies (e.g., Geller et al., 2001b). This research has extended Geller et al.'s (2001a) preliminary study of developmental differences in clinical correlates of OCD by including an examination of the familial aggregation of OCD, the severity

of OCD across a number of associated features of the disorder, and the degree of functional impairment associated with OCD across age groups.

The findings of this study are limited by a number of methodological shortcomings. The most significant weakness in the current study relates to the sampling method. While this study was not intended to represent an epidemiological investigation of OCD, the use of treatment-seeking samples in this study remains to limit the extent to which the data can be generalised beyond the clinical setting. Furthermore, the sampling method permits for the possibility of considerable differences in client motivation for seeking treatment across age groups, which may account for observed differences in the data. For example, it has been speculated in the literature that anxious/avoidant behaviour in boys is less likely to be tolerated and accepted by parents or teachers (e.g., Dadds, Spence, Holland, Barrett & Laurens, 1997) and thus the slight preponderance of boys in the child and adolescent samples may in fact be a result of differences in parental detection of OCD across gender. Further, adult males may be less likely to seek treatment for a psychological condition such as OCD than adult females, and thus the decrease in the percentage of male adults may reflect this tendency. This being said, the data found in this study are highly consistent with data reported across child and adult epidemiological studies (i.e., Flament et al., 1988; Karno et al., 1988; Weissman et al., 1994; Zohar, 1999), suggesting that the gender distribution of clients seeking treatment for OCD is representative of the actual distribution of people with the disorder in the community.

Another possible weakness in this study was the use of the ADIS-P structured diagnostic interview, which does not include full diagnostic assessments of pervasive developmental disorders, Tourette syndrome, eating disorders, substance-use disorders or somatoform disorders; hence age-related comparisons were not possible for these disorders. In addition, this study relied on retrospective reporting of the onset of OCD, as well as on family history of psychiatric problems. The use of retrospective report has the potential for recall bias, particularly for adult samples who may be attempting to recall information from childhood. This study did not attempt to control for differences across groups associated with the different stages of emotional and cognitive development that possibly account for the observed differences in clinical correlates (e.g., level of insight). Instead, this study attempted to provide a clinical snapshot of how OCD presents at different ages, and assumed that developmental factors will play a role in observed difference. Further investigations using longitudinal designs will offer more accurate and detailed insight into subtyping the pathogenesis of OCD at different ages and associated with different ages of onset.

The identification of age-related differences in the clinical correlates of OCD is of clinical and theoretical importance for a number of reasons. If OCD is associated with unique clinical correlates at different ages, then recognition of these will assist in the accurate assessment and identification of the disorder. Furthermore, accurate classification of the age-related differences of OCD will allow for the refinement of current treatment strategies, which will ensure treatments effectively target features of the disorder as it presents at different developmental stages. Currently, CBT treatments for children and adolescents with OCD are based on adult models of OCD; while these treatments are effective for approximately 60% to 80% of participants (i.e., percentage diagnosis-free; see Barrett et al., 2004; March, Mulle, & Herbel, 1994; Piacentini, Bergman, Jacobs, McCracken, & Kretchman, 2002; Wever & Rey, 1997), there remains considerable room for improvement in terms of actual remission rates for

child and adolescent sufferers. Finally, the identification of developmental subtypes of OCD will allow for the systematic evaluation of factors associated with the aetiology and maintenance of the disorder at different developmental stages, which will result in more precise and theoretically driven treatment guidelines.

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