Obsessive-compulsive disorder across developmental trajectory: Cognitive processing of threat in children, adolescents and adults

Lara Farrell* and Paula Barrett
School of Psychology, University of Queensland, Brisbane, Australia

Background. While the cognitive theory of obsessive-compulsive disorder (OCD) is one of the most widely accepted accounts of the maintenance of the disorder in adults, no study to date has systematically evaluated the theory across children, adolescence and adults with OCD.

Method. This paper investigated developmental differences in the cognitive processing of threat in a sample of children, adolescents and adults with OCD. Using an idiographic assessment approach, as well as self-report questionnaires, this study evaluated cognitive appraisals of responsibility, probability, severity, thought-action fusion (TAF), thought-suppression, self-doubt and cognitive control. It was hypothesised that there would be age related differences in reported responsibility for harm, probability of harm, severity of harm, thought suppression, TAF, self-doubt and cognitive control.

Results. Results of this study demonstrated that children with OCD reported experiencing fewer intrusive thoughts, which were less distressing and less uncontrollable than those experienced by adolescents and adults with OCD. Furthermore, responsibility attitudes, probability biases and thought suppression strategies were higher in adolescents and adults with OCD. Cognitive processes of TAF, perceived severity of harm, self-doubt and cognitive control were found to be comparable across age groups.

Conclusions. These results suggest that the current cognitive theory of OCD needs to address developmental differences in the cognitive processing of threat. Furthermore, for a developmentally sensitive theory of OCD, further investigation is warranted into other possible age related maintenance factors. Implications of this investigation and directions for future research are discussed.

The cognitive-behavioural theory of obsessive-compulsive disorder (OCD) proposes that cognitive content and processes are central in the aetiology and maintenance of the disorder. Researchers responsible for pioneering the cognitive theory of OCD contend...
that obsessions represent the extreme end on a continuum of normal, unwanted, intrusive cognitions (Rachman, 1981; Salkovskis, 1985, 1989). They argue that these negative and unwanted intrusive thoughts play a crucial role in the development of the clinical obsessions (Clark & Purdon, 1993; Rachman, 1981; Rachman & Hodgson, 1980; Salkovskis, 1985, 1989). A number of empirical studies have supported this idea, demonstrating that almost 90% of non-clinic individuals report experiencing frequent intrusive thoughts, images, or impulses (Parkinson & Rachman, 1981; Rachman & de Silva, 1978; Salkovskis & Harrison, 1984), and that these intrusive thoughts are often indistinguishable in ‘content’ from those experienced by obsessive-compulsive individuals. Normal intrusive thoughts appear to differ from obsessional thoughts, however, in that they occur less frequently, they are interpreted with less emotionally intensity, they are more controllable, and they are less likely to be associated with overt or covert ritualising (Clark & Purdon, 1993). Researchers in the field argue that specific cognitive biases, associated with the interpretation of these normal intrusive thoughts, might account for the development and maintenance of obsessions, and consequently clinical OCD.

Cognitive appraisals of risk (including perceived severity and probability of harm) and responsibility for harm are central processes in the cognitive theory of OCD (Rachman, 1976, 1993; Salkovskis, 1985, 1989). Risk appraisals of inflated harm probability refer to beliefs related to the likelihood of aversive events occurring, while appraisals of inflated harm severity refer to beliefs about the personal cost that may result from the occurrence of aversive events. Salkovskis (1985, 1989) considerably advanced the cognitive theory of OCD by proposing that the interpretation of negative intrusive thoughts, as indicating personal responsibility for harm to self or others, leads to increased discomfort and anxiety, increased salience of the thoughts, and neutralizing behaviours, including overt and covert compulsions, avoidance behaviours, and thought suppression. In this way, an intrusive thought related to harm of others, for example, ‘my daughter might be abducted during the night’, would probably be interpreted by the obsessive-compulsive in the following way: ‘if I don’t check on my daughter all through the night, then she might be abducted and it would be my fault because I am responsible for protecting her’. A number of studies with adult samples, using idiographic, psychometric, and experimental designs, have tested the central components of the cognitive theory and have found moderate to strong support for cognitive biases of increased responsibility, probability, and severity of harm associated with obsessive-compulsive symptoms (i.e. Carr, 1974; Clark, & Purdon, 1993; Foa & Kozak, 1986; Freeston & Ladouceur, 1993; Freeston, Ladouceur, Gagnon, & Thibodeau, 1991; Freeston, Rheume, & Ladouceur, 1996; Frost & Steketee, 1991; Lopatka & Rachman, 1995; Rheume, Ladouceur, Freeston, & Letarte, 1994; Rheume, Ladouceur, Freeston, & Letarte, 1995; Shafran, 1997; Steketee & Frost, 1994; Steketee, Frost, & Cohen, 1996).

Thought suppression is an example of one of the counterproductive escape/avoidance mechanisms associated with OCD. Thought suppression, largely developed and investigated by Wegner and colleagues (i.e. Wegner, Schneider, Carter, & White, 1987; Wegner, 1994; Wegner & Zanakos, 1994), refers to the voluntary effort to suppress or inhibit an idea, thought, or image, in an attempt to neutralize any anxiety or discomfort associated with the idea, thought, or image. Paradoxically, intentional thought suppression has been consistently found to result in a later rebound or resurgence of the unwanted thought following suppression attempts across both OCD and non-clinic samples (Clark, Ball, & Pape, 1991; Clark & de Silva, 1985; Rachman, 1993; Wegner,
The finding that intentional control over unwanted thoughts is problematic for individuals is most evident in OCD, where sufferers are besieged by obsessions that seem near impossible to repress (Purdon & Clark, 2002). The lack of cognitive control over one's thoughts/obsessions is a significant complaint associated with OCD. These cognitive efforts to control one's thoughts (i.e. through thought suppression), are argued to also be associated with the maintenance of obsessions and the disorder (see Purdon, 1999 for a review).

Other cognitive processes thought to be important in the maintenance of OCD are self-doubt (i.e. O’Kearney, 1998) and thought-action fusion (TAF; Rachman, 1993). Self-doubt is argued to be a distinctive feature of OCD and accounts for the indecisiveness characteristic of sufferers of OCD. TAF as described by Rachman (1993) is a cognitive process associated with OCD, where thoughts and actions concerning harm are experienced as equivalent. TAF involves a likelihood bias, whereby thinking of an aversive event (e.g. acting violently towards a loved one) is perceived as increasing the likelihood of that event occurring. In addition, TAF also involves a morality bias, whereby the obsessive-compulsive interprets thoughts concerning immoral behaviour (e.g. violence towards a loved one) as equally as bad as actually engaging in immoral behaviour (Shafran, Thordarson, & Rachman, 1996). Research has demonstrated that TAF is significantly correlated with obsessive-compulsive symptoms (Rachman, Thordarson, Shafran, & Woody, 1995); appears to be higher across obsessional samples in comparison to non-clinic samples (Shafran et al., 1996), and is associated with increased frequency of intrusive thoughts, higher discomfort, and more resistance of thoughts (Rassin, Merckelbach, Muris, & Spaan, 1999). In a recent investigative study of TAF, thought suppression and obsessive-compulsive symptoms, Rassin and colleagues (Rasin, Muris, Schmidt, & Merckelbach, 2000) found that TAF triggers thought suppression, which, in turn, promotes obsessive-compulsive symptoms.

While there is sufficient research support implicating these cognitive processes as maintaining features of adult OCD, only two preliminary studies to date have investigated the role of cognitive processes in the maintenance of childhood OCD. Barrett and Healy (2003) examined cognitive appraisals of threat in a sample of children with OCD (aged 7 to 13 years), and compared these with a sample of anxious and non-clinic children. Using an idiographic approach, as proposed by the Obsessive-Compulsive Cognition’s Working Group (1997), this study assessed cognitive interpretations of perceived responsibility for harm, probability of harm, severity of harm, thought-action fusion, self-doubt, and cognitive control. It was hypothesized that, consistent with the cognitive theory of OCD in adults, children in the OCD group would display higher estimations of these cognitive processes in comparison to anxious and non-clinic children. Results revealed that OCD children reported significantly higher ratings of responsibility, severity, TAF, and less cognitive control in comparison to non-clinic children; however, there were few significant differences between anxious children and children with OCD. In fact, children with OCD could only be clearly differentiated from anxious children on ratings of cognitive control. These preliminary findings fail to find strong support for an OCD-specific cognitive theory in childhood. It was concluded from this study that these cognitive processes in OCD clients might become more prominent during adolescence, when cognitive development advances allowing children to be ‘meta-cognitive’, and when OCD might worsen in severity. An investigation of age-related differences may shed light on the issue of when cognitive processing associated with OCD might become apparent in younger samples.
In only the second study examining cognitive processing of threat in childhood OCD, Barrett and Healy-Farrell (2003) investigated the role of perceived responsibility in obsessive-compulsive symptomatology. Replicating the experimental paradigms of Lopatka and Rachman (1995) and Shafran (1997), perceived responsibility of threat was experimentally manipulated in a sample of children and adolescents with OCD, during a behavioural avoidance task (BAT). The effects of high responsibility on levels of perceived probability of harm, severity of harm, distress, ritualizing, and avoidance was examined. This study manipulated levels of perceived responsibility by varying the presence of others during a BAT and assigning responsibility using signed contracts between the child and the experimenter. Results indicated that the experimental manipulation was successful in inflating perceived responsibility for children and adolescents with OCD; however, an increased perception of responsibility for harm did not lead to increased perceptions of probability for harm, severity for harm, or levels of distress, as hypothesized and demonstrated in adult samples.

In this same study, Barrett and Healy-Farrell (2003) investigated whether cognitive-behavioural treatment (CBT) would decrease ratings across these cognitive processes, related distress, avoidance, and ritualizing during the high responsibility BAT at post-treatment. In terms of treatment outcome, there were significant reductions in diagnostic status, symptom severity, and cognitive processing of threat for children who completed the CBT family intervention, in comparison to children on a waitlist. Taken together, these two studies (Barrett & Healy, 2003; Barrett & Healy-Farrell, 2003) do suggest that children with OCD report somewhat inflated levels of these cognitive biases when compared with non-clinic children, and that CBT is effective in reducing these perceptions of threat. However, the first experimental study (Barrett & Healy-Farrell, 2003) investigating the cognitive processes in children and adolescents with OCD failed to find support for the critical role of responsibility, as proposed by Salkovskis (1985, 1989). As such, the current cognitive theory of OCD in adulthood may not adequately explain and account for the disorder as it presents in children and adolescents. Further research investigating the cognitive processes involved in childhood and adolescent OCD is clearly warranted, as well as research investigating other possible factors that may account for the development and maintenance of this disorder in childhood. While conducting this research provides many inherent challenges - for example, reliably measuring cognition in children – an understanding of the applicability of the current cognitive theory to child and adolescent OCD is important and will advance interventions for youngsters.

The aim of the current study is to investigate whether OCD clients interpret threat in a similar way across the developmental trajectory. This study will investigate key cognitive processes, demonstrated to be associated with the maintenance of OCD in adults, across specific age groups from childhood to adulthood, to identify the applicability of this theory to different developmental age groups. This study is significant for a number of reasons. Firstly, current conceptualizations and treatment approaches for childhood OCD are based solely on the cognitive-behavioural theory and treatment of adult OCD. To improve intervention efficacy, cognitive-behavioural strategies need to target the specific cognitive processes associated with the presentation and maintenance of the disorder as it presents at different developmental stages. This research is of theoretical significance, insofar as an understanding of the developmental differences in cognitive processing of OCD, will allow for a ‘developmentally sensitive’ refinement of the current cognitive theory of OCD, which may serve to advance conceptual models of the disorder.
Based on our previous research (Barrett & Healy, 2003; Barrett & Healy-Farrell, 2003), it seems that OCD-related cognitive biases are not as apparent or salient in child and adolescent samples, as found in similar research with adults. The question of theoretical importance is whether differences in cognitive threat ratings are due to measurement issues associated with reliably assessing cognition in children, or due to actual heterogeneity in the cognitive correlates of the disorder at different developmental stages. Measuring cognition in children is difficult due to developmental obstacles in cognitive development, such as the ability for children to be meta-cognitive; that is, to ‘think about their thinking’, which usually develops around 11 years of age when children transition from concrete operational thinking into more abstract thinking associated with formal operational thinking (i.e. Piaget’s stages of development; 1926, 1928). Further obstacles related to measurement of cognition associated with OCD include the absence of reliable and valid instruments for assessing cognitive biases in child and adolescents sample. The question of heterogeneity is important because it may be that children and adolescents with OCD do not have similar cognitive biases as those reported by adults with OCD. It may be that these cognitive biases develop over time as a result of living with the disorder, or that these cognitive biases develop with increased severity of the disorder. It is possible that adults, who in general have suffered with OCD for many more years than children and adolescents (although not always the case), report more salient cognitive biases due to the accumulated time they suffered with the disorder, and/or due to increased severity of the disorder. These questions may be answered by examining age-related differences in cross-sectional research, and through longitudinal research designs.

This study extends previous research by Barrett and Healy (2003) and Barrett and Healy-Farrell (2003) by examining the cognitive processing of threat across a sample of children, adolescents and adults through self-report inventories and idiographic assessment tasks. It is hypothesized that children, adolescents, and adults will cognitively process threat in dissimilar ways; more specifically, there will be higher OCD-related cognitive bias ratings of threat for adolescents, and adults compared with children, and higher ratings for adults compared with adolescents. More specifically, it is hypothesized that increased chronological age will be associated with higher levels of responsibility for harm, probability of harm, severity of harm, thought suppression, TAF, self-doubt, and cognitive control as measured by self-report inventories and idiographic ratings of threat. It was further hypothesized that increased severity may also be associated with increased cognitive ratings. The rationale for these predictions is based on the limited support found for these cognitive biases in preliminary investigations by Barrett and Healy (2003) and Barrett and Healy-Farrell (2003) investigating cognitive interpretations of threat in samples of youngsters with OCD.

**Method**

**Participants**

Children and adolescents, aged 6 to 17 years, were recruited through referrals from community mental health agencies, general practitioners, child mental health specialists, and following media announcements as part of the recruitment strategy for a controlled treatment trial of CBT for paediatric OCD being run at Griffith University (Barrett, Healy-Farrell, & March, 2004). For involvement in this study, adults were recruited through conjoint advertising with the treatment study, and were offered CBT...
treatment for their participation in assessment procedures. Children, adolescents, and adults were selected into this study on the basis of a primary diagnosis of OCD, based on the Diagnostic and Statistical Manual for Mental Disorders (fourth edition) criteria (DSM-IV; American Psychiatric Association, 1994).

As a requirement of the treatment trial, exclusionary criteria included primary major depression or another primary anxiety disorder, externalizing disorders, tourette’s syndrome, autistic spectrum disorder (ASD), schizophrenia, organic mental disorder, or mental retardation. There was one exception to the exclusionary criteria for involvement in this study. Participants meeting criteria for comorbid externalizing disorders were also included in this assessment study (once informed consent was obtained); however, they were not offered free treatment as part of the trial. Instead, they were referred elsewhere for treatment once they completed this assessment study.

The current study consisted of two separate assessment procedures including idiographic cognitive assessment tasks, as well as a self-report assessment package. The entire sample completed the idiographic cognitive assessment task; however, the self-report package was developed later in the study and hence only a proportion of the entire sample completed these. The entire sample for this study consisted of 34 children, aged 6 to 11 years (M = 9.62; SD = 1.56), 39 adolescents, aged 12 to 17 years (M = 14.13; SD = 1.61), and 38 adults aged 18 to 66 years (M = 32.21; SD = 12.52). There were 19 male and 15 female participants in the child group, 16 male and 23 female participants in the adolescent group, and 14 male and 24 female participants in the adult group. The sample that completed both the semi-idiographic cognitive assessment task and the self-report package consisted of 14 children (M = 9.64; SD = 1.60), 16 adolescents (M = 14.13; SD = 1.78), and 29 adults (M = 31.00; SD = 11.50). There were 9 male and 5 female participants in the child group, 6 male and 10 female participants in the adolescent group, and 12 male and 17 female participants in the adult group.

**Measures**

**The Anxiety Disorders Interview Schedule for DSM-IV, Parent Version; Adult Version (ADIS-P; Silverman & Albano, 1996; ADIS-Adult; Brown, Di Nardo, & Barlow, 1994).**

The ADIS-P is a semi-structured interview designed specifically to diagnose anxiety disorders in children and adolescents, and differentiate these from other internalizing and externalizing 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 (e.g. psychotic disorders). ADIS-P interviews were conducted with parents alone, which, in the majority of cases, involved mothers only. ADIS-Adult interviews were conducted with the adult OCD client, either in the presence of their parent/partners or alone, depending on the clients’ preference.

Studies that have examined the psychometric properties of the ADIS-P have shown excellent inter-rater reliability (i.e. r = .93; Silverman & Nelles, 1988) and good retest reliability (i.e. r = .67 over 10- to 14-day period; Silverman & Eisen, 1992). Research has also shown the ADIS-P to have good construct validity (Tracey, Chorpita, Dohman, & Barlow, 1997), as well as good convergent validity between ADIS-P diagnoses and Multidimensional anxiety scale for children factor scores corresponding to social phobia (r = .64), separation anxiety disorder (r = .68), and panic disorder (r = .72; Wood, Piacentini, Bergman, McCracken, & Barrios, 2002). Likewise, the ADIS-Adult has
demonstrated good to excellent inter-rater reliability across the majority of diagnostic categories (i.e. \( r = .67 \) major depression disorder to .86 specific phobia; Brown, Di Nardo, Lehman, & Campbell, 2001). To date, there are no published studies on the validity of the ADIS-IV adult interview.

All diagnostic interviews were videotaped and inter-rater reliability was conducted across 25% of all interviews using the kappa statistic to assess reliability of diagnoses. Reliability was calculated for each diagnostic category. Reliability ranged from high agreement (i.e. \( \kappa = 0.63 \) for generalised anxiety disorder) to excellent agreement (i.e. \( \kappa = 1.00 \) for OCD) across diagnostic categories, with the overall mean kappa for diagnostic reliability indicating excellent inter-rater agreement (\( \kappa = 0.94 \)).

**Children’s Yale-Brown obsessive compulsive scale (CY-BOCS; Scahill et al., 1997) and Yale-Brown obsessive-compulsive scale (Y-BOCS; Goodman et al., 1989a).**

The CY-BOCS is a widely used, clinician rated, semi-structured interview, assessing 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 CY-BOCS total score are: (a) mild (10 to 18; distress but not necessarily functional impairment), (b) moderate (19 to 29; distress and functional impairment), and (c) severe (30 or above; severe distress and serious impairment; March & Mulle, 1998).

The CY-BOCS has demonstrated excellent internal consistency (\( r = .87 \)), good to excellent inter-rater 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 inter-rater reliability (\( r = .86 \) to .98), 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).

**Revised TAF Scale (Shafran et al., 1996).**

The revised TAF scale assesses the degree to which clients interpret intrusive thoughts as having personal significance for them. The revised TAF scale assesses two components of TAF; that is, morality TAF, and likelihood TAF. The revised TAF scale consists of 19 items, rated 0 (strongly disagree) to 4 (strongly agree). Of these, 12 items evaluate the fusion of thoughts and actions in terms of morality (e.g. thinking blasphemous thoughts is almost as sinful as blasphemous actions), 4 items assess TAF for likelihood of negative events happening to a friend/relative (e.g. thinking of a friend falling ill increases the chances that he/she will fall ill), and 3 items assess TAF for likelihood of negative events happening to oneself (e.g. if I think of myself being injured in a car accident, this will increase the chances that I will be injured in a car accident).

Studies evaluating the psychometric properties of this measure have demonstrated that TAF is a highly reliable construct across student, adult and obsessional samples (Shafran et al., 1996). Internal consistency of both the moral and likelihood scales has been shown to be excellent across samples, with Cronbach’s alpha ranging from .85 to .96 (Shafran et al., 1996). The TAF subscales were shown to be adequately associated.
with the Maudsley Obsessive-Compulsive Inventory checking subscale (i.e. \( r = .31 \)to .38; Shafran et al., 1996). This measure was slightly adapted for children and adolescents in this study to ensure it was easily comprehensible.

**Distressing Thoughts Questionnaire** (DTQ; Clark & De Silva, 1985).
The DTQ was developed to assess cognitive features of negative intrusive thoughts and images using 12 different depressive and anxious thought statements. Each statement is assessed across five cognitive factors associated with intrusive thoughts, these being: frequency (i.e. *how often does this thought/image enter your mind*), sadness (i.e. *how sad does this thought/image make you feel*), worry (i.e. *how worried does this thought make you feel*), uncontrollability (i.e. *how difficult is it for you to remove this thought/image from your mind*), and disapproval (i.e. *how much do you disapprove of this thought/image entering your mind*). Each statement is assessed across these five dimensions using 9-point Likert scales ranging from 1 (*not at all/never*) through 5 (*moderately/at least twice a month*) to 9 (*extremely/daily*). Scores are computed for both anxious and depressed statements across the five cognitive variables providing a total score for anxious thoughts (range = 30–270) and a total for depressive thoughts (range = 30–270), as well as a DTQ total score, which is the sum of all 12 thought statements across the five cognitive ratings (range = 60–540). Internal reliability is high for this measure across anxious and depressive totals (i.e. \( r = .89 \) and \( .95 \), respectively), and there is adequate test-retest reliability data for this measure (i.e. \( r = .64 \) and \( .67 \); Clark & De Silva, 1985). As this measure was developed for adults, it was also slightly adapted for use by children.

**Responsibility Attitudes Scale** (RAS; Salkovskis et al., 2000).
This 26-item questionnaire was designed to assess general beliefs about responsibility. Items tap into responsibility beliefs regarding possible harm, which are characteristic of the concerns associated with OCD. Responses reflect the degree of agreement or disagreement with specific statements. Items are rated on a 7-point Likert scale ranging from 1 (*totally agree*) to 7 (*totally disagree*). Examples of items include: *I often feel responsible for things that go wrong; I am often close to causing harm; and everything I do can cause serious problems*. A total score for this measure is obtained by reverse scoring all items, summing all items, and then obtaining a mean score ranging from 1 (no responsibility appraisals) to 7 (very high responsibility appraisals).

Internal consistency for the RAS is high, with Cronbach’s alpha of .92 (Salkovskis et al., 2000). Similarly, the RAS has excellent test-retest reliability, with Cronbach’s alpha of .94 (Salkovskis et al., 2000). The RAS has demonstrated adequate concurrent validity with other measures of obsessionality, with Pearson product moment correlations of 0.57 with the Maudsley Obsessive-Compulsive Inventory, and 0.54 with the Obsessive-Compulsive Inventory (Salkovskis et al., 2000). The wording used in this measure was somewhat changed to enable better understanding by children; however, care was taken to ensure the meaning of each item was not altered.

**White Bear Suppression Inventory** (WBSI; Wegner & Zanakos, 1994).
The WBSI was developed to assess the degree to which people attempt to suppress intrusive thoughts. The measure is comprised 15 items, rated on a 5-point Likert scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). Examples of items include:
there are things I would prefer not to think about; I have thoughts that I cannot stop; and I wish I could stop thinking about certain things. A total score for this measure is obtained by summing all item responses.

The WBSI has demonstrated excellent internal stability ($r = .89$) and good test-retest reliability ($r = .69$) over 3-week to 3-month testing periods (Wegner & Zanakos, 1994). Furthermore, the WBSI has demonstrated adequate convergent validity with measures of anxiety (i.e. $r = .53$ and .49 with the State Trait Anxiety Inventory and the anxiety sensitivity index, respectively), depression (i.e. $r = .44$ to .52 with the Beck Depression Inventory), and OCD (i.e. $r = .38$ to .40 with the Maudsley obsessive-compulsive scale; see Wegner & Zanakos, 1994). This measure was also slightly altered for ease of interpretation by children.

**Idiographic cognitive assessment tasks**

To assess levels of perceived responsibility for harm, probability of harm, severity of harm, and subjective units of distress (SUD) associated with harm, this study uses an idiographic assessment procedure suggested by the Obsessive-Compulsive Working Group (1997) and used by Barrett and Healy (2003a). Using a standardized sentence stem (e.g. If I think ___ and don’t ___ then ___ will happen), the most frequent intrusive thought, the expected neutralisation and the consequences of not engaging in the neutralisation are added for each of the OCD respondents. In this way, OCD relevant threats are individualized for each respondent, using a standardized expectancy format. For example, a typical OCD-relevant threat might be: ‘If I think my hands have germs on them and don’t wash them over and over again, then I will get really, really sick’.

Idiosyncratic beliefs of responsibility, probability, and severity, as well as a truth rating (to assess accuracy of intrusive thought) and a SUD rating are assessed for each respondent’s OCD relevant intrusive thought. Ratings are obtained on 7-point Likert scales for each of these dimensions. Ratings are obtained using fear thermometers, ranging in intensity from 0 (*not at all*) to 6 (*extremely*). Respondents are asked to rate their appraisals in the following way: (1) how much is this something you worry about (truth rating), (2) how bad would it be for you if you did get sick (severity rating), (3) how likely is it that you would get really sick if you didn’t wash your hands over and over (probability rating), (4) how much would it be your fault if you did get really sick because you didn’t wash your hands over and over again (responsibility rating), and (5) how bad/anxious would you feel if you did get sick from not washing your hands (SUD rating).

To assess levels of TAF likelihood, self-doubt, and degree of cognitive control, a similar idiographic assessment task was also conducted, as was done in the Barrett and Healy study (2003a). This task involves three multiple choice questions, which are individualized for participants using an OCD relevant worry. A standard sentence stem (e.g. If I think ___) is used, with the participant’s most frequent intrusive thought added (e.g. If I think I have germs on my hands).

Ratings are obtained using a multiple-choice format with ratings ranging from 0 to 2 (i.e. 0 = absence of cognitive bias, 1 = slight presence of bias, 2 = complete presence of bias). For TAF likelihood the multiple choice options include: (a) probably nothing bad will happen, (b) something bad might happen, and (c) something bad will happen for sure. For self-doubt, the multiple-choice options are: (a) I am sure I will fix the problem by doing (ritual) once, (b) I am sure I will fix the problem by doing (ritual) a few times, and (c) I am not sure I will fix the
problem even if I do (ritual) over and over again. And finally, for degree of cognitive control over thoughts, the multiple-choice options include: (a) I can stop thinking about it and do something else, (b) I keep worrying about it but if I do something else than the thought goes away, and (c) I keep worrying about it over and over again, I can’t stop thinking about it.

Procedure
Following referral to the Griffith University OCD treatment trial (see Barrett et al., 2004) or adjunct adult OCD study, participants were screened for eligibility into this project via a telephone-screening interview. During this telephone screen, which assesses suitability by screening for a possible OCD diagnosis as well as screening for exclusionary criteria, the aims and procedures of the research were fully explained to the participants (i.e. parents in the case of children and adolescents, and the client in the case of adult participants). Participants thought to be eligible for inclusion based on this screening interview, were invited into the clinic for full diagnostic assessments (i.e. ADIS-P/ADIS-Adult interviews). Prior to diagnostic assessments, the benefits of the research and participants ethical rights were fully explained and written informed consent was obtained. Clinically trained postgraduate students, blind to the hypotheses of the research, conducted these interviews. All diagnostic interviews were videotaped for the purposes of reliability analysis.

Following the diagnostic interviews, a second appointment was booked in for participants to return to the clinic to complete the idiographic cognitive task assessments and cognitive self-report forms (i.e. TAF, DTQ, RAS, WBSI). A clinically experienced postgraduate student, trained in the cognitive assessment tasks, conducted the assessment procedures for this study. Procedural guidelines were developed and followed by the postgraduate student to ensure instructions were standardized for each respondent. The order that the cognitive assessments tasks and the self-report measures were presented to clients was counterbalanced to avoid order effects.

Prior to the idiographic assessment tasks, participants were trained in how to respond using the fear thermometers. Symptom information gained during the diagnostic interview assisted in developing the individualized OCD-relevant threat scenarios. Whenever necessary, the postgraduate student sought assistance from the client to ensure accurate symptom sentence stems. The postgraduate student assisted all participants in completing the cognitive self-report forms by providing standardized instructions and reading through each statement with participants. The student provided participants with further instruction when necessary, to ensure comprehension of each item.

Following these assessments, all children and adolescents who were eligible for inclusion in the treatment trial were offered the free individual or group cognitive-behavioural treatment. As an incentive for participation in this research, 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’s Psychology Clinic for appropriate treatment.

Results
Analyses of between-subject comparisons across age groups (i.e. children, adolescents, adults) were conducted with one-way analyses of variance (ANOVA), followed by
Tukey’s post hoc tests. Multiple comparisons were conducted across variables, which may potentially result in increased Type I error across analyses. To adequately control for Type I error across multiple outcome measures, investigators have typically chosen to forgo MANOVA, since it does not adequately control for error when the partial null hypothesis is true (group differences for some outcome measures, but not for others), instead conducting separate univariate F tests on each outcome variable, and then applying a Bonferroni-based correction. However, statisticians suggest that this method is overly conservative and often results in low statistical power (Jaccard & Guilamo-Ramos, 2002). These overly conservative corrections are argued to result in unacceptably high rates of Type II errors. In clinical research samples, such as children, adolescents and adults with OCD, the sample sizes are already very small compared with non-clinical samples, and as a result, statistical power is low to begin with. In preliminary analyses, a less conservative correction of alpha, using the Holm-modified Bonferroni approach (see Jaccard & Guilamo-Ramos, 2002), was applied. The results using this approach parallel those presented here without Bonferroni corrections, with the exception of some differences in statistical significance on the DTQ subscales only.1 Given that the nature of this study really was to examine a broad range of cognitive correlates of OCD, to investigate potential differences in the presentation of this disorder across age, Bonferroni corrections were not applied to ensure adequate power to detect group differences, at the risk of inflated Type I error (Jaccard & Guilamo-Ramos, 2002).

Preliminary data screening for assumptions of ANOVA indicated there was significant positive skew (i.e. depression subscales of DTQ; TAF likelihood other), and significant negative skew (i.e. cognitive ratings of truth, severity, probability, responsibility, SUD) across variables in the data. There were also a few extreme data points in the sample (N = 5; one child, four adults), which were found to be consistently extreme across a number of variables. To rectify these problems, variables that were significantly skewed were transformed using logarithmic data transformations and extreme variables were deleted. Analyses were run both on transformed and untransformed data, and a number of differences were observed in the analyses as a result of the transformations. In addition, the normality of the data distributions was improved across these variables following transformations. Therefore, analyses using transformed data with extreme scores deleted will be presented here.2 Participant numbers slightly varied across analyses due to missing data, usually the result of incomplete questionnaires or invalid responses.

**Symptom severity**

Results of ANOVA indicated significant differences across age groups in severity, as rated by the C/Y-BOCS total scores, \( F(2, 109) = 8.57; p < .001. \) Post hoc tests indicated that adults experienced significantly higher severity ratings (\( M = 28.22; SD = 7.82 \)) than both adolescents (\( M = 23.18; SD = 6.02; p < .01 \)) and children (\( M = 21.68; SD = 7.21; p < .001 \)), who did not differ significantly from each other. Further descriptive information relating to the diagnostic severity of OCD, symptom characteristics, and comorbidity of this sample is described in more detail in Farrell, Barrett, and Piacentini (in press), which examines the clinical correlates of OCD across age groups.

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1 A description of results using the Holm-modified Bonferroni correction is available from Dr Lara Farrell.

2 Untransformed means and standard deviations of cognitive variables, across age groups are available from Dr Lara Farrell.
Cognitive self-report measures

Table 2 describes means and standard deviations for the cognitive self-report data across age groups. Results of the ANOVAs indicated that there were significant differences across age groups on the DTQ subscales, including anxiety frequency, $F(2, 51) = 3.32$; $p < .05$, depression frequency, $F(2, 51) = 5.05$; $p < .05$, depression sad, $F(2, 51) = 5.37$; $p < .01$, depression worry, $F(2, 51) = 5.92$; $p < .01$, depression removal, $F(2, 51) = 5.34$; $p < .01$, and depression disapproval, $F(2, 51) = 4.90$; $p < .05$. There was also a significant between-groups effect on the DTQ total depression score, $F(2, 51) = 4.45$; $p < .05$, and on the total DTQ score, $F(2, 51) = 4.29$; $p < .05$. Post hoc tests revealed that for anxiety frequency, children reported significantly less anxious thoughts in comparison to adolescents ($p < .05$), but not adults. For depression frequency, children reported significantly less depressive thoughts than adults ($p < .01$), but not adolescents. Across depressive thoughts, children made significantly lower ratings on the subscales of sad, worry, removal and disapproval than both adolescents and adults ($p < .05$). Likewise, on the DTQ total depression score and the overall DTQ score, children made significantly lower ratings than both adolescents and adults ($p < .05$).

There were significant differences across age groups on total scores for the RAS, $F(2, 52) = 6.59$; $p < .005$ and for the WBSI, $F(2, 53) = 3.56$; $p < .05$. Post hoc tests revealed that children reported significantly lower ratings on responsibility attitudes than both adolescents and adults ($p < .01$). Children also reported significantly less thought suppression, as measured by the WBSI, in comparison to adults ($p < .05$), but not adolescents.

There were no significant differences across age groups on self-reported ratings of TAF Table 1.

Although this study used well-validated self-report measures for adults, there are to date no measures developed to assess cognitive appraisals of threat in children and youth. All adult measures were carefully adapted for children and youth in terms of language used, and questionnaires were given following an interview-based delivery so that clinicians could check for comprehension. Analyses of internal consistency were conducted across age groups for all measures to demonstrate the reliability of responses provided within this study. Results indicated that responses to these cognitive self-report measures within each age group were highly consistent, suggesting excellent internal consistency. Alpha coefficients are presented in Table 2.

Idiographic cognitive task ratings

Table 3 displays the means and standard deviations on cognitive ratings from the idiographic cognitive tasks across age groups. Results of the ANOVAs revealed significant between subject differences on ratings of truth, $F(2, 96) = 6.47$; $p < .005$, probability, $F(2, 96) = 10.39$; $p < .001$, responsibility, $F(2, 96) = 7.17$; $p < .005$, and SUD, $F(2, 96) = 5.35$; $p < .01$. Post hoc tests revealed that adolescents rated the idiographic threat scenarios as significantly lower on truth in comparisons to adults ($p < .005$), but not children. On cognitive measures of probability, responsibility and SUD, children and adolescents, who did not differ significantly from each other, reported significantly lower ratings in comparison to adults ($p < .05$).

There were no significant differences across age groups on ratings of severity of harm, TAF, self-doubt or cognitive control.
Table 1. Means and standard deviations on cognitive self-report forms across groups

<table>
<thead>
<tr>
<th></th>
<th>Children</th>
<th>Adolescents</th>
<th>Adults</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M (SD)</td>
<td>M (SD)</td>
<td>M (SD)</td>
<td></td>
</tr>
<tr>
<td><strong>DTQ Anxiety</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Frequency</td>
<td>15.91 (9.30)</td>
<td>26.94 (11.48)</td>
<td>22.41 (11.19)</td>
<td>&lt;.05*</td>
</tr>
<tr>
<td>Sad</td>
<td>15.09 (10.73)</td>
<td>24.69 (11.99)</td>
<td>24.41 (13.89)</td>
<td>.10</td>
</tr>
<tr>
<td>Worry</td>
<td>14.91 (10.76)</td>
<td>26.00 (11.59)</td>
<td>25.19 (13.37)</td>
<td>.05</td>
</tr>
<tr>
<td>Removal</td>
<td>14.55 (10.72)</td>
<td>22.06 (12.85)</td>
<td>22.67 (13.31)</td>
<td>.19</td>
</tr>
<tr>
<td>Disapproval</td>
<td>16.82 (14.52)</td>
<td>28.63 (12.99)</td>
<td>28.04 (15.35)</td>
<td>.08</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>77.27 (54.90)</td>
<td>128.31 (58.21)</td>
<td>122.70 (61.79)</td>
<td>.07</td>
</tr>
<tr>
<td><strong>DTQ Depression</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Frequency*</td>
<td>1.00 (0.29)</td>
<td>1.28 (0.34)</td>
<td>1.36 (0.31)</td>
<td>&lt;.05*</td>
</tr>
<tr>
<td>Sad*</td>
<td>0.97 (0.28)</td>
<td>1.32 (0.33)</td>
<td>1.32 (0.33)</td>
<td>&lt;.01a,b</td>
</tr>
<tr>
<td>Worry*</td>
<td>0.97 (0.27)</td>
<td>1.33 (0.33)</td>
<td>1.33 (0.31)</td>
<td>&lt;.01a,b</td>
</tr>
<tr>
<td>Removal*</td>
<td>0.95 (0.22)</td>
<td>1.29 (0.32)</td>
<td>1.29 (0.33)</td>
<td>&lt;.01a,b</td>
</tr>
<tr>
<td>Disapproval*</td>
<td>1.00 (0.30)</td>
<td>1.36 (0.33)</td>
<td>1.36 (0.35)</td>
<td>&lt;.05a,b</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>59.45 (48.18)</td>
<td>131.13 (83.55)</td>
<td>136.52 (77.67)</td>
<td>&lt;.05a,b</td>
</tr>
<tr>
<td><strong>DTQ Total</strong></td>
<td>136.73 (99.79)</td>
<td>259.44 (134.73)</td>
<td>259.22 (125.78)</td>
<td>&lt;.05a,b</td>
</tr>
<tr>
<td><strong>RAS</strong></td>
<td>18.08 (16.56)</td>
<td>22.71 (11.66)</td>
<td>23.44 (10.04)</td>
<td>.44</td>
</tr>
<tr>
<td><strong>TAF Moral</strong></td>
<td>0.54 (0.41)</td>
<td>0.68 (0.41)</td>
<td>0.68 (0.40)</td>
<td>.58</td>
</tr>
<tr>
<td><strong>TAF Self</strong></td>
<td>3.54 (3.64)</td>
<td>5.13 (3.27)</td>
<td>5.29 (3.69)</td>
<td>.33</td>
</tr>
<tr>
<td><strong>RAS</strong></td>
<td>3.08 (1.19)</td>
<td>4.46 (0.95)</td>
<td>4.40 (1.25)</td>
<td>&lt;.005a,b</td>
</tr>
<tr>
<td><strong>WBSI</strong></td>
<td>48.15 (13.97)</td>
<td>57.93 (8.91)</td>
<td>58.86 (13.08)</td>
<td>&lt;.05</td>
</tr>
</tbody>
</table>

Note. DTQ = Distressing Thoughts Questionnaire; TAF = Revised Thought-Action Fusion Scale; RAS = Responsibility Attitudes Scale; WBSI = White Bear Suppression Inventory.
*transformed variables.
*significance at post hoc between children and adolescents.
*significance at post hoc between children and adults.

Table 2. Internal consistency of self-report measures across age groups

<table>
<thead>
<tr>
<th>Measure</th>
<th>Child (N = 12 to 14)</th>
<th>Youth (N = 13 to 16)</th>
<th>Adult (N = 27 to 28)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Distressing Thoughts Questionnaire</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(DTQ; Clark &amp; De Silva, 1985)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DTQ anxiety scale</td>
<td>.987</td>
<td>.954</td>
<td>.953</td>
</tr>
<tr>
<td>DTQ depression scale</td>
<td>.987</td>
<td>.988</td>
<td>.982</td>
</tr>
<tr>
<td>DTQ Total</td>
<td>.987</td>
<td>.984</td>
<td>.978</td>
</tr>
<tr>
<td>Responsibility Attitudes Scale</td>
<td>(.944)</td>
<td>(.930)</td>
<td>(.962)</td>
</tr>
<tr>
<td>(RAS; Salkovskis et al., 2000)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Revised Thought-Action Fusion Scale</td>
<td>(.971)</td>
<td>(.970)</td>
<td>(.940)</td>
</tr>
<tr>
<td>(TAF; Shafran et al., 1996)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>White Bear Suppression Inventory</td>
<td>(.926)</td>
<td>(.908)</td>
<td>(.946)</td>
</tr>
<tr>
<td>(WBSI; Wegner &amp; Zanakos, 1994)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Symptom severity and cognitive ratings

Table 4 presents the bivariate Pearson correlations between symptom severity, as rated by the C/Y-BOCS and cognitive self-report totals for the DTQ, TAF, RAS mean score and WBSI, as well cognitive ratings of severity, probability and responsibility, as measured by the idiographic task. The correlations between symptom severity and cognitive ratings were all positive and significant (except for TAF moral total, which was not significant); however, all correlations were only small to moderate in size with significant correlations ranging from .21 (responsibility ratings) to .40 (WBSI total).

Discussion

This study examined developmental differences in the cognitive processing of threat across three distinct age group samples (i.e. children, adolescents, and adults) of individuals with OCD. The results of this study provide some evidence for differences in the cognitive processing of threat associated with OCD across developmental age groups. This study is the first to systematically evaluate developmental differences across a number of cognitive processes proposed to be central in the cognitive theory of OCD.

The results of this study demonstrated that children with OCD experience significantly fewer anxious intrusive thoughts in comparison to adolescents. Similarly, children reported experiencing significantly fewer depressive intrusive thoughts in comparison to adults, with significantly less sadness, worry, disapproval, and removal strategies associated with these thoughts in comparison to both adolescents and adults. Furthermore, results of the DTQ total depression score and the total DTQ score suggest that intrusive depressive thoughts, experienced by children with OCD, are significantly less distressing and less difficult to resist in comparison to those experienced by adolescents and adults. These results are consistent with recent research that has shown that in addition to adults experiencing more severe symptoms of OCD; they also report significantly higher rates of comorbid major depression than both children and adolescents with the disorder (Farrell et al., in press). Taken together, it seems that OCD in childhood is associated with significantly less depressive symptoms and fewer depressive intrusive thoughts. Furthermore, intrusive thoughts appear to become more...
Table 4. Person correlations between symptom severity totals and cognitive self-report and cognitive ratings

<table>
<thead>
<tr>
<th>CY-BOCS Total score Pearson correlation</th>
<th>WBSI</th>
<th>RAS mean</th>
<th>Total DTQ</th>
<th>TAF moral</th>
<th>TAF self</th>
<th>TAF others</th>
<th>Severity rating</th>
<th>Probability rating</th>
<th>Respons. rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>CY-BOCS Total score</td>
<td>0.402</td>
<td>0.370</td>
<td>0.365</td>
<td>0.183</td>
<td>0.274</td>
<td>0.301</td>
<td>0.354</td>
<td>0.319</td>
<td>0.218</td>
</tr>
<tr>
<td>Sig. (two-tailed)</td>
<td>0.002</td>
<td>0.005</td>
<td>0.006</td>
<td>0.187</td>
<td>0.043</td>
<td>0.027</td>
<td>0.000</td>
<td>0.001</td>
<td>0.027</td>
</tr>
<tr>
<td>N</td>
<td>56</td>
<td>55</td>
<td>55</td>
<td>53</td>
<td>55</td>
<td>54</td>
<td>102</td>
<td>102</td>
<td>102</td>
</tr>
</tbody>
</table>

Note: DTQ = distressing thoughts questionnaire; TAF = Revised Thought-Action Fusion scale; RAS = Responsibility Attitudes Scale; WBSI = White Bear Suppression Inventory.
frequent, intense and difficult to resist during adolescence and adulthood in comparison to childhood for sufferers of OCD.

Consistent with Salkovskis (1985, 1989) and others (Freeston et al., 1996; Rachman, 1993), responsibility biases were evident across age groups in this study. Based on ratings of perceived responsibility related to the idiographic OCD threat scenarios, results of this study suggest that children and adolescents rate OCD threat scenarios with significantly less personal responsibility than adults do. However, on a self-report measure of responsibility attitudes, children report significantly less responsibility in comparison to both adolescents and adults, suggesting that by adolescence, there appears to be an increase in attitudes regarding personal blame for harm that is similar to that reported by adults with OCD. Mean RAS scores obtained in this study, for both adolescents and adults (i.e. 4.46 and 4.40, respectively) were comparable to the mean score obtained by Salkosvskis et al. (2000) in their study with obsessional adults (i.e. 4.69).

On a self-report measure of thought suppression (i.e. WBSI), children reported significantly less tendency to suppress thoughts in comparison to adults, but not adolescents. This result suggests that children with OCD employ less thought control, or suppression strategies, in comparison to adults; however, adolescence do not differ significantly from either group. It appears then, that thought suppression might become more evident with the increasing frequency and intensity of intrusive thoughts and the development of responsibility attitudes, which appear to become more prominent in adolescence and adulthood.

Results on the idiographic ratings of perceived probability of harm and SUD related to the occurrence of the OCD related threat scenarios, revealed that children and adolescents, who did not differ significantly from each other, reported significantly lower ratings in comparison to adults. These results are again consistent with previous research that has demonstrated cognitive probability biases associated with OCD in adulthood (e.g. Carr, 1974; Clark & Purdon, 1993; Foa & Kozak, 1986), as well as increasing distress associated with OCD with increasing age (i.e. Farrell et al., in press). Inspection of truth ratings revealed that adolescents rated the idiographic OCD-related threat scenario as less accurate for them in contrast to adults who rated the truth of the scenarios as highly accurate. Inspection of untransformed data indicates that across all groups the accuracy of the idiographic OCD threat scenarios were rated on average as at least ‘pretty accurate/true’, indicating that results should be reasonably accurate across the age groups.

Interestingly, there were no apparent age-related differences on self-reported or idiographic ratings of TAF. While TAF did appear to slightly increase across chronological age groups, the results suggest that TAF is likely to be associated with OCD in childhood to a similar degree as it is in adolescence and adulthood. Likewise, idiographic ratings on perceived severity of harm associated with OCD, self-doubt and controllability of thoughts (i.e. cognitive control) were similar across age groups, suggesting that children, adolescence, and adults similarly perceive the severity of harm associated with OCD as ‘fairly’ to ‘very’ severe, experience similar levels of self-doubt, and experience comparable levels of difficulty in controlling intrusive thoughts.

An examination of age group differences in symptom severity of OCD, as well as correlational analysis between OCD symptom severity and cognitive ratings, was conducted to evaluate the degree to which severity of symptoms may account for differences across age groups in cognitive processing of threat. There were significant age group differences in severity of OCD, with symptoms more severe for adults compared with children and adolescents who did not differ from each other.
Furthermore, there were positive and significant correlations between OCD severity and almost all cognitive variables, except TAF morality, suggesting that OCD does increase in severity in adulthood, and increased severity is associated with increased cognitive bias ratings. However, it should be noted that correlations, though significant, were only small to moderate in strength, indicating that while severity may account for age-related differences in cognitive interpretations of threat, there are possibly other developmental factors that may account for these differences.

The findings of this study are mixed, with some support for homogeneity of cognitive processing of threat across age groups, in addition to preliminary support for heterogeneity across age groups in the interpretation of threat associated with OCD. The results suggest that there might be core cognitive processes associated with OCD, which appear from an early age (i.e. as young as 6 years) and are constant across the developmental trajectory, in addition to other cognitive processes that appear to develop later in adolescence. For example, cognitive processes of TAF perceived severity of harm, self-doubt, and cognitive control appear comparable across children, adolescence, and adults with OCD. However, children experience less intrusive thoughts (particularly depressive thoughts), which are less distressing and less uncontrollable than those experienced by adolescents and adults. Furthermore, responsibility attitudes, probability biases, and thought suppression strategies clearly intensify during adolescence and resemble those of adults with OCD. These results might suggest that TAF, self-doubt, and uncontrollability of ones thoughts are more closely linked with the development of OCD in childhood, whereas other cognitive factors, such as responsibility, probability, and thought suppression, might develop either at a later developmental stage or as a consequence of other obsessive-compulsive symptoms. The theoretical implications of this study are that the current cognitive theory of OCD may not adequately explain how the disorder develops or is maintained during childhood. It appears that not all cognitive biases associated with adult OCD are present in children, and that these may in fact develop either over time or at a later developmental stage, or with increased severity of symptoms. These findings warrant further research into the cognitive theory and its application to children and youth, and present implications for cognitive treatment and early intervention/prevention.

Obviously, given the cross-sectional nature of this study, further research utilizing longitudinal designs is necessary to investigate the cognitive processes involved in the aetiology and maintenance of OCD across child, adolescent, and adult onset of the disorder. In addition, further research needs to validate measures assessing cognitive processes in OCD for children and adolescence so that future studies can reliably examine developmental differences in cognitive interpretations of threat for individuals with OCD. In an attempt to maintain statistical power in this relatively small sample, this study did not invoke Bonferroni-based corrections for each univariate test. In clinical research samples, such as children, adolescents, and adults with OCD, the sample sizes are already very small, and as a result, statistical power is low to begin with. The implication of this is that the results should be interpreted with caution, keeping in mind the potential inflation of Type I error. On the other hand, the results have some weight behind them due to the increased statistical power associated with the uncorrected alpha rate criterion. The aim of this study was to explore possible patterns of results that might initiate and guide further research with larger samples (including non-clinical studies) in this area of research that to date is largely unstudied. Further replication studies are needed to add strength to the findings in this study, and future research with larger clinical and non-clinical samples is necessary to investigate the OCD across the developmental trajectory.
correlates of OCD phenomena using more stringent and conservative statistical criterion. Future studies using larger samples would also allow for statistical modelling of data, which would provide important information relating to the mediating effects of specific cognitive variables on obsessive-compulsive symptoms and severity. This study is the first to systematically evaluate developmental differences in cognitive processing of threat associated with OCD across the life trajectory. Given that the cognitive theory of OCD offers one of the most widely endorsed accounts of the development, maintenance, and treatment of OCD, an accurate account of whether these cognitive processes occur across developmental stages is imperative. An accurate and developmentally sensitive conceptual model of the development and maintenance of OCD during childhood and adolescence would lead to the refinement of current assessment procedures and treatment guidelines, to the benefit of children and adolescents suffering from OCD. The results of this study suggest a revised developmentally sensitive cognitive theory of OCD may be warranted to adequately account for the development and maintenance of OCD in children and youth.

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References


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