Internet-delivered Cognitive Behaviour Therapy for Obsessive-Compulsive Behaviour in Children with Autism Spectrum Disorder

by

Heather Jaksic

A Thesis submitted to the Faculty of Graduate Studies of

The University of Manitoba

in partial fulfilment of the requirements of the degree of

DOCTOR OF PHILOSOPHY

Department of Psychology

University of Manitoba

Winnipeg

Abstract

Research suggests that there is a high degree of comorbidity between autism spectrum disorder (ASD) and obsessive-compulsive disorder (OCD) or obsessive-compulsive behaviours (OCBs). Further, a convincing body of literature has found family-based Cognitive Behaviour Therapy (CBT) to be an effective treatment for these behaviours in both typically developing children and children with ASD. However, CBT is costly and not accessible to many families, including those in rural communities. In order to address these concerns, a growing body of literature has evaluated Internet-delivered CBT to treat typically developing children with OCD. However, previous research has not evaluated treatment outcomes for Internet-delivered CBT to treat OCB in children with ASD. Using a multiple-baseline-across-behaviours research design, the present study examined a 9-week Internet-delivered function-based CBT manualized treatment package to treat OCB in 2 school aged children with ASD. The treatment included weekly WebEx video sessions, parent training, and online assignments. In addition, caregiver interviews took place 15- to 18-months post intervention for the researcher to better understand the strengths and weaknesses of the program, as well as the impact of the pandemic. The results showed a decrease in all treated OCBs both post-treatment and 7- to 9- months following treatment. Caregivers also described a number of challenges that they had encountered related to COVID-19. Although preliminary, the results suggest that Internet-delivered CBT may be an effective treatment choice for children with ASD (i.e., IQ >70) and OCBs.

Acknowledgements

I would like to extend a big thank you to my advisor, Dr. Joseph Pear, and the members of my committee: Dr. Pamela Holens, Dr. Laine Torgrud, and Dr. Harold Wallbridge, for their valuable guidance and unwavering support throughout my time at the University of Manitoba. A special thank you to Courtney Bishop and Dr. Vivian Lee for all of their help with the assessments. I would also like to thank my husband and number one supporter, Chris Jaksic, for his remarable patience in supporting my never ending academic journey (and his ability to insert roman numeral page numbers into a word document). This research was supported in part by the University of Manitoba Graduate Fellowship.

Dedication

To my husband, Chris and son, Alexander.

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Introduction

Autism Spectrum Disorder (ASD) is a neurodevelopmental disorder which is characterized by symptoms in two key domains: impairments in social communication, and the presence of repetitive and/or restricted behaviours (American Psychiatric Association [APA], 2013). A meta-analysis, which reviewed 31 studies (N=2,121), reported that 17.4% of children and adolescents with ASD also met diagnostic criteria for Obsessive-Compulsive Disorder (OCD; van Steensel et al., 2011). Further, Muris et al. (1998) found that 72.7% of children with ASD also presented with symptoms of OCD (e.g., checking, washing rituals). OCD is defined by the presence of obsessions (i.e., recurrent and unwanted thoughts and/or feelings) followed by ritualized behaviours (i.e., compulsions) intended to reduce anxiety (APA, 2013).

One body of research has conceptualized repetitive behaviours as either lower order or higher order behaviours (Hollander et al., 2009). Lower order behaviours, which are perceived to moderate arousal from atypical sensory processing, include behaviours such as hand flapping and self-injurious behaviours. Higher order behaviours, which may serve to reduce anxiety, include ordering, washing, checking, and rituals. It is the higher order repetitive behaviours that are common in both ASD and OCD. However, this overlap combined with the lack of introspection typically seen in children with ASD makes it difficult to distinguish whether these higher order repetitive behaviours fit better under the ASD or OCD diagnosis. Further, from a behaviour analytic perspective diagnoses hold limited value. Rather than categorizing, each unique behaviour should be assessed and treated accordingly. This is particularly important both because labels are not causes for behaviour and due to the significant variability in topography in

the repetitive behaviours seen in children with ASD. For these reasons, and to remain consistent with recent research (e.g., Neil et al., 2017; Vause et al., 2020), the present study used the term Obsessive Compulsive Behaviour (OCB) as opposed to diagnosing these children with OCD.

CBT for OCB in Children with Autism Spectrum Disorder

CBT, which is recommended as a first line treatment for typically developing children with OCD, consists of cognitive training, psychoeducation/awareness training, exposure and response prevention (ERP), mapping OCB (see Appendix A), and relapse prevention (Benazon et al., 2002). A growing, but still limited, body of research has begun to explore OCB in children and adolescents with ASD. While introspection is often considered to be a key component of many traditional CBT packages, adapations made when treating individuals with ASD tend to de-emphasize introspection. Instead a focus on more behavioural strategies as well as an increase in parent involvement have been successful (Lang et al., 2010). Several case studies (e.g., Lehmkuhl et al., 2008; Neil et al., 2017; Reaven & Hepburn, 2003; Vause et al., 2014), which used adapted CBT protocols, have shown decreases in OCB in young people with ASD. For example, Vause et al. (2014) treated two school-aged children with ASD using an adapted CBT treatment that incorporated behavioural strategies and a large amount of parent involvement. The authors reported decreases in both the standardized measures (including the Child Yale-Brown Obsessive Compulsive Scale) and the daily parent report data. Treatment gains were maintained at a 3-to-4-month follow-up, showing a clinically significant reduction in OCB.

A series of promising trials have been conducted evaluating CBT for OCD and/or anxiety disorders in children with ASD (e.g., Farrell et al., 2012; Sofronoff et al., 2005; Sukhodolsky et al., 2013; Wood et al., 2009). In an open trial, 43 youth with OCD and complex comorbid conditions, including 15 with ASD diagnoses, participated in a group family-based CBT

treatment (Farrell et al., 2012). A significant treatment effect was found using the Child Yale-Brown Obsessive-Compulsive Scale (CY-BOCS), with an overall remission rate of 47% and an approximate remission rate for those with ASD of 40% (Farrell et al., 2012). Sofronoff et al. (2005) also found encouraging results in a randomized controlled trial (RCT), which included 71 children (10-12 years) with both ASD and parent-reported child anxiety. Participants were randomly assigned to a with-parent involvement group, without-parent involvement group, or a waitlist control. Results indicated that although children in both the with- and without-parent groups improved significantly, the with-parent group improved more. The authors concluded that parent participation is an important treatment component when treating anxiety (including OCB) in this ASD population.

Most recently an RCT (Vause et al., 2020) used a CBT treatment package (*I Believe in me, Not OCB!*; Vause et al., 2013a; Vause et al., 2013b), with a strong parent involvement component (e.g., weekly parent training), to treat OCB in 17 children (7-13 years) with ASD. Results showed significant decreases in OCB in the treatment group compared to a treatment-as-usual group, as found on the CY-BOCS and the Repetitive Behaviour Scale-Revised (RBS-R). The authors also reported a significant decrease in the severity of OCB on a daily rating scale completed by parents. Results maintained at a 6-month follow-up suggest that family-based CBT treatment packages may be an effective method for reducing OCB in children with ASD. Further, a recent review article concluded that adapted CBT programs tailored to children with ASD show promising results in the treatment of OCD. This included the children's workbook utilized in the present study (Bedford et al., 2020).

Internet-delivered Therapy

In 2012 Statistics Canada estimated that over the previous 12-months approximately 10.1% of Canadians age 15 years and older met criteria for at least one of six selected mental or substance use disorders, with a lifetime prevalence of approximately 1/3 of the population (Pearson et al., 2013). Very limited research has investigated the availability of mental health services within Canada; however, one study reported that 35.5% of Canadians who felt that they needed counselling services did not have access to them (Sunderland & Findlay, 2013). Further, barriers to mental health treatment such as low income, long wait times, and distance from services have been cited (Slaunwhite, 2015).

Internet-delivered therapy was primarily developed from a need for more easily accessible, cost-effective intervention programs. Internet-delivered therapy is defined as any structured treatment program that involves therapeutic interaction between a mental health professional and their client taking place through the Internet (Abbott et al., 2008; Rochlen et al., 2004). Internet-delivered therapy can take on many forms and incorporate a variety of both synchronous (i.e., the therapist and client are online at the same time) and asynchronous (i.e., the therapist and client are not online at the same time) elements. Among other things, Internet-delivered therapy can include e-mail, video conferencing (e.g., WebEx), online testing, videos or images, and online programs that allow for exchange of treatment materials (e.g., Web-based Computer-Aided Personalized System of Instruction [WebCAPSI]; Pear & Kinsner, 1988). The plethora of different options available for Internet-delivered therapy allows for individualized therapy programs that meet the needs of individuals while still remaining structured and based on empirical research (Abbott et al., 2008).

A growing body of research has pointed to the many benefits of Internet-delivered therapy. For instance, clients have greater access to the therapist, which is often not limited to a

scheduled therapy session. Therapy can also be accessed through desktop computers, laptops, smartphones, iPads, video gaming systems, and any other device connected to the Internet (Marks & Cavanagh, 2009). As a result, clients do not need to leave their homes to attend therapy sessions, which is particularly convenient for individuals living in rural communities and those with mobility problems who otherwise may not have access to mental health services (Rochlen et al., 2004). One review found that clients felt that accessing therapy through the comfort of their homes reduced the stigma often associated with receiving psychotherapy in a clinic (Marks, & Cavanagh, 2009). Another review noted that Internet-delivered therapies provide clients with quick and easy access to additional resources (Rochlen et al., 2004). Several studies found Internet-delivered therapies to be more cost effective compared to both face-to-face therapy and medication (Klein et al., 2006). For instance, one controlled study comparing the costs associated with Internet-delivered therapy, face-to-face therapy, and medication for clients with panic disorder or phobia, found the cost of Internet-delivered therapy was 37% of the cost of face-to-face therapy and 45% of the cost of treating the client with medication (Marks et al., 2003).

In addition to convenience and affordability, Internet-delivered therapies have been proven to be promising for treating a wide variety of psychological disorders and medical conditions, some of which include OCD (Comer et al., 2017; Storch et al., 2011), eating disorders (Winzelberg et al., 2000), panic disorder (Carlbring et al., 2006), chronic pain (Holens et al., 2017), post-traumatic stress disorder (Knaevelsrud & Maercker, 2007), depression (Lappalainen et al., 2014), alcohol abuse (Postel et al., 2015), and fibromyalgia (Simister et al., 2018).

While there are a number of advantages to Internet-delivered therapies, the growing body of research in this area has also brought forth a number of potential challenges. Aspvall et al. (2020) reported that the therapists in their study found Internet-delivered therapy particularly challenging with more complex clinical symptoms (e.g., mental compulsions). Several studies assessed individuals' attitudes towards Internet-delivered therapy. Concerns that were expressed included: difficulties establishing a therapeutic relationship, limited access to nonverbal behaviours, lack of legal guidelines, high dropout rates, lack of current research, and the possible inappropriateness of Internet-delivered therapy for more complex mental health concerns (Andersson & Titov, 2014; Mora et al., 2008; Stallard et al., 2010; Wolters et al., 2017; Wootton et al., 2011). Interestingly, the respondents (including clinicians) in many of the studies that assessed attitudes towards Internet-delivered therapies had little or no prior experience with Internet-delivered treatments (Wolters et al., 2017).

Computer Aided System of Instruction

In 1984, Dr. Joseph Pear developed Computer-Aided Personalized System of Instruction (CAPSI) at the University of Manitoba in collaboration with Dr. Witold Kinsner (Pear et al., 2011) and then WebCAPSI in 1994. CAPSI was founded on the principles of Keller's (1968) Personalized System of Instruction (PSI). PSI has been found to be a more effective teaching method compared to the traditional lecture method (Kulik et al., 1990). As in PSI, the core features of CAPSI are that (a) small portions of the course or training material are delivered at a time, (b) it is inherently self-paced and due to its online nature, can be completed at students' convenience, (c) prompt and detailed feedback is provided throughout, (d) students do not fail tests, but instead are given the opportunity for a "restudy" – meaning that students restudy material before attempting another test on material on which they did not receive a pass, (e) in

order for the student to progress to the next unit, they are required to demonstrate mastery in their current unit, and (f) students at more advanced levels have the opportunity to peer-review (i.e., evaluate other students' answers; Pear et al., 2011).

Instructors are able to individualize their CAPSI courses by developing questions at levels that meet their expectations. CAPSI questions are typically written in a short answer format, without any form of restrictive questions (e.g., True/False, multiple choice). Pear and Martin (2004) argue for this format because it cannot be guaranteed that thinking is happening in response to restrictive-answer questions.

CAPSI is a convenient, empirically supported method for online teaching, with evidence of consumer satisfaction (i.e., 77% of students responded that they would take another CAPSI course; Pear & Novak, 1996) and the ability to be adapted to various learning and teaching styles (Springer & Pear, 2008). Recently, CAPSI has expanded beyond teaching to include therapy (i.e., CAPSI Therapy). CAPSI Therapy offers many of the same components as CAPSI (e.g., a medium for delivering material, prompt feedback, assignments), but is instead intended for therapy. In one preliminary trial (Holens et al., 2017), the authors used CAPSI Therapy to assist in delivering an online acceptance-based behavioural treatment for chronic pain to 15 adults. Results showed significant reductions on a number of pain related measures, including pain acceptance.

In a recent RCT (Simister et al., 2018), CAPSI Therapy was used to treat 27 adults with fibromyalgia through 7 modules of acceptance and commitment therapy. The authors found statistically significant improvements in pain acceptance, depression, and some fibromyalgia symptoms. However, the researchers did note some challenges with participants not always completing all written assignments (Simister, 2015).

Face-to-Face Therapy or Internet-delivered Therapy?

In order to understand the effectiveness or lack of effectiveness of online treatment programs, comparison with the status quo (e.g., face-to-face treatments) is necessary. For instance, researchers of one RCT compared the effectiveness of an asynchronous Internet-delivered therapy to face-to-face therapy for 75 adult participants with social phobia (Andrews, Davies, & Titov, 2011). Results indicated that there was no significant difference between groups on outcome measures. However, there was a significant difference in the amount of therapist time that was required to facilitate the groups, with the Internet-delivered and face-to-face groups taking 18 minutes and 240 minutes, respectively, per participant. A lack of follow-up data and the absence of a formal social phobia diagnosis using the DSM were limitations to this study.

In another study, the authors compared a synchronous Internet-delivered CBT to face-to-face CBT for the treatment of depression in 62 adults (Wagner et al., 2014). Using the Beck Depression Inventory-II (Beck et al., 1996) the authors found no difference between Internet-delivered and face-to-face therapy at post-test, with large pre- to post- effect sizes for both groups (d = 1.27 and d = 1.37, respectively). Interestingly, when assessed at three-months follow-up the depressive symptoms of the participants in the face-to-face groups had increased significantly, while the depressive symptoms of the Internet-delivered participants had not. This led the authors to suggest that Internet-delivered therapy for depression may result in greater long-term benefits compared to face-to-face therapy.

Although treatment outcomes seem to be positive for a number of disorders (e.g., depression, social phobia), researchers have suggested that due to some ethical concerns, face-to-face therapy might be more appropriate for specific populations. For example, individuals who

experience distortions of reality, suicidal ideation, are currently experiencing physical or sexual abuse, and those with a diagnosis of borderline personality disorder, might be better candidates for face to face therapy (Abbott et al., 2008; Rochlen et al., 2004; Stofle, 2001; Suler, 2001).

Overall, preliminary research suggests that treatment outcomes for many Internet-delivered therapies are at least comparable to traditional face-to-face therapy and possibly even superior in the long term (Lappalainen et al., 2014; Wagner et al., 2014). Internet-delivered therapy is also cost effective (Klein et al., 2006; Marks et al., 2003) and can require significantly less therapist time (Andrews et al., 2011; Marks & Cavanagh, 2009). However, Internet-delivered therapy is still a relatively new area, with limited research evaluating treatment outcomes for any specific disorder. Replication is needed with controlled studies that have large sample sizes and more diverse populations.

Internet-delivered CBT for Children with Anxiety Disorders

A growing body of research has explored the use of technology for delivering CBT to children and adolescents with a range of anxiety disorders (e.g., Khanna & Kendall, 2010; Spence et al., 2006). A meta-analysis that reviewed 7 studies using Internet-assisted CBT to treat children with anxiety disorders, found that overall treatment outcomes were comparable to clinic-delivered CBT (Rooksby et al., 2015). The researchers also found that these results were maintained at follow-up and generally received positive reviews from the children and their families. In a second meta-analysis, which only included RCTs, the authors found computer-based CBT for children and adolescents with anxiety or depression to be superior to wait-list controls (Ebert et al., 2015). Overall, research supports the use of Internet-delivered CBT to treat typically developing children with anxiety disorders, particularly when face-to-face interventions are not feasible.

Most recently, an RCT evaluated an Internet-based CBT program to treat anxiety in 42 children with ASD and anxiety (Conaughton et al., 2017). The authors found that compared to the waitlist-control group, the children demonstrated a reduction in anxiety symtoms and their overall number of diagnoses, but no significant difference in the loss of their primary diagnosis. The authors noted that compliance rates for components of the program that did not directly involve the therapist (e.g., six parent sessions) were lower than a similar study which involved neurotypical children. They suggested that this may be due to the large number of additional challenges often faced by families of children with ASD.

Internet-delivered CBT for Children with Obsessive Compulsive Disorder

Most research evaluating Internet-delivered therapy outcomes has been conducted with adults using CBT. However, therapy for children is fundamentally different from therapy with adults. Not only is the material delivered in different ways, there is also typically the added component of parental involvement (Vause et al., 2015) and less opportunity for the asynchronous therapeutic approaches sometimes utilized with adults. Given these differences and the positive relationship between early intervention and positive treatment outcomes, it is important to develop and empirically test Internet-delivered treatment programs for children (Dawson et al., 2010; Smith et al., 2000).

To my knowledge, only two studies thus far have evaluated CBT for pediatric OCD using a synchronous Internet-delivered approach (Comer et al., 2017; Storch et al., 2011). In one study, researchers conducted a controlled study with 31 children and adolescents in which they compared Internet-delivered therapy through a web camera to a treatment-as-usual waitlist control group (Storch et al., 2011). The experimental group received 14 online sessions, each of which were 60-90 minutes long. The handouts and other CBT material were e-mailed to the

participant. Promising results were found, including large effect sizes on all measures (e.g., CY-BOCS and the Children's Global Assessment Scale). Overall, Storch et al. (2011) reported that 56% of the Internet-delivered participants lost their OCD diagnosis by post-test, with 81% of the Internet-delivered participants being defined as treatment remitters, compared to only 13% of the treatment-as-usual waitlist control group.

In another study the researchers evaluated an Internet-delivered family-based CBT treatment program, using a RCT research design, for 22 children (i.e., 11 per group) with early onset OCD (ages 4-8 years; Comer et al., 2017). Participants were randomized into either an Internet-delivered treatment or a clinic-based treatment. The treatment package utilized for both groups, which built upon the work of Freeman and Garcia (2009), was adapted for developmental age. This package included 12 sessions across 14 weeks. The authors found large within-group effect sizes for all standardized assessment measures (e.g., the Anxiety Disorders Interview Schedule for Children and Parents, Children's Global Assessment Scale, and CY-BOCS) for both groups, which were maintained at follow-up. The Internet-delivered group outperformed the clinic group (i.e., the percentage of "excellent responses") at both post-test (72.7% vs. 60%) and follow-up (80% vs. 66.7%) although these differences were not statistically significant. An "excellent response" was defined as a score of 1 (very much improved) or 2 (much improved) on the Clinical Global Impressions Scale. Overall, the authors found the Internet-delivered effect sizes were consistent with findings found in traditional face-to-face treatment outcomes for the same population.

In addition to the two studies described above, Aspvall et al (2020) used an asynchronous approach to Internet-delivered CBT across three countries for pediatric OCD with neurotypical children. Results showed a reduction in OCD symptoms that were maintained at a 3-month

follow-up, although some challenges with participants not completing all of the treatment modules were noted.

In summary, preliminary research appears to support the use of online CBT interventions to treat typically developing children with OCD (Comer et al., 2017; Storch et al., 2011). Given these encouraging results, future research should include larger sample sizes and systematic evaluations of parental involvement.

Present Study

As indicated above, a growing body of literature has evaluated the use of face-to-face CBT to treat OCB in children with ASD, with promising results (e.g., Vause et al., 2014; Vause et al., 2020). Further, preliminary research supports the use of Internet-delivered CBT for typically developing children with OCD. However, no known study to date has evaluated Internet-delivered treatment to address OCB in children with ASD. The present study built on previous research in this area by making use of an adapted CBT treatment package titled *I Believe in Me, Not OCB! (*Vause et al., 2013a; Vause et al., 2013b) to treat two school-aged children with ASD and OCB over the Internet. The initial plan had been to recruit additional participants; however, due to the COVID-19 pandemic recruitment was discontinued. Instead, the author took advantage of a naturally occurring phenomenon to examine the impact of COVID-19 on OCB, by interviewing three of the participants caregivers.

Methods

Research Design

A multiple-baseline-across-behaviours research design was utilized in the present study study using daily parent report data. Caregivers were also asked to complete 6 weekly CAPSI assignments based on material learned during parent training. Pre- and post-treatment measures

were included with the intent of running additional statistical tests. However, due to the COVID-19 global pandemic, recruitment was stopped. More specifically, the onset of COVID-19 brought about a number of practical, ethical, and reseach-related concerns, particularly given the significant daily stressors already faced by individuals and families within the ASD community. Additional caregiver interviews related to the impact of COVID-19 were added in order to better understand the strengths and weaknesses of the program, as well as the impact of the pandemic on OCB. The University of Manitoba Human Research Ethics Board approved all procedures used in this study along with a revised parental consent form reflecting the procedural changes. Due to the small sample size, meaningful inferential statistical testing could not be completed with the pre- and post-measures; however, these measures are reported in the Results section of this thesis.

Participants

Two school-aged children (i.e., 12-13 years of age) were recruited through physicians and ASD organizations (e.g., Autism Ontario). An additional female participant was also initially recruited; however, she dropped out after the third session due to being accepted into a time-intensive government funded treatment program. The participants' parents underwent a brief over-the-phone screening assessment before moving on to standardized assessments. In order to participate, the participants needed to (a) meet criteria for ASD (as defined by the ADOS-2 [Autism Diagnostic Observation Schedule – Second Edition] and ADI-R [Autism Diagnostic Interview-Revised]), (b) have an estimated Full Scale IQ (Wechsler Abbreviated Scale of Intelligence Second Edition [WASI-II]) of ≥ 70 (i.e., Borderline range or above), (c) not be receiving treatment for anxiety or repetitive behaviour, (d) not be participating in intensive behavioural intervention (IBI) during the study, (e) be currently engaging in a minimum of three

OCBs as defined by the CY-BOCS, and RBS-R (Repetitive Behaviour Scale-Revised), and (f) have no plans to change medication throughout the duration of the study. Given the nature of this web-based study, participants also needed to have access to a home computer connected to the Internet and live in Southern Ontario where the study was conducted (due to the need to conduct pre- and post-assessments in person). Information about the child's development, educational/medical/diagnostic history, and family demographics were obtained from a history questionnaire completed by parents.

Participant 1 was a 12-year-old Caucasian male who had received a diagnosis of Asperger's Syndrome when he was 34 months of age. A diagnosis of ASD was confirmed, upon intake into the present study, using the ADOS-2 and ADI-R. Participant 1's estimated IQ (WASI-II; Wechsler, 2011) at the assessment was in the Low Average range. At the time of the study, Participant 1 lived primarily with his mother and maternal grandmother. His mother attended all therapy and assessment sessions with him.

Participant 2 was a 13-year-old Caucasian male who had received a diagnosis of Asperger's Syndrome when he was 5 years of age. A diagnosis of ASD was again confirmed using the ADOS-2 and ADI-R upon intake into the study. Participant 2's estimated IQ (WASI-II; Wechsler, 2011) was also in the Low Average range. During the study's initial intake, Participant 2 lived with his younger sister and both of his biological parents. However, during the course of the study his parents separated, resulting in him spending time between both households. Although actively involved in his treatment, including pre- and post-assessments and weekly phone calls with the clinician, his father only attended the first treatment session. However, his mother attended all treatment and assessment sessions with him. Throughout treatment and assessments, parents sometimes disagreed about OCB severity. In these cases, we

defaulted to his mothers response as she was both attending sessions, and spent more time with him.

Measures

A Ph.D. level graduate student administered all standardized assessments. The assessor received more than 70 hours of training in the measures administered by an individual with a Ph.D. in Clinical Psychology. Interobserver agreement between the principal investigator and assessor were completed by reviewing video-taped sessions of the CY-BOCS and RBS-R assessments. The principal investigator independently reviewed and scored the assessments. Agreement was calculated by taking the number of agreements and dividing them by the total number of agreements plus disagreements, and multiplying by 100. Scores for each question were compared, with 92% agreement.

Inclusionary Measures

Inclusionary measures included all assessment measures needed to assess the participants' eligibility for the present study.

Wechsler Abbreviated Scale of Intelligence Second Edition (WASI-II). The WASI-II (Wechsler, 2011) is a standardized measure of intelligence for individuals from 6-89 years of age. The 4 subtests included on the WASI-II are: Vocabulary, Similarities, Block Design, and Matrix Reasoning. Together these subtests provide an estimate of an individual's full-scale IQ.

Autism Diagnostic Interview-Revised (ADI-R). The ADI-R (Lord, Rutter, & Le Couteur, 1994) is a 93-item semi-structured clinical assessment, which was administered to the participants' caregivers. The ADI-R focuses on three key areas: quality of social interaction, communication and language, and repetitive, restricted and stereotyped interests and behaviour. The ADI-R has good psychometric properties with a high test-retest reliability range between the

five sections (α = 0.93-0.97), and an inter-rater reliability score of α = 0.89. This assessment was used to confirm each participant's ASD diagnosis. A doctoral level Ph.D. student administered this assessment.

Autism Diagnostic Observation Schedule – Second Edition (ADOS-2). The ADOS-2 (Lord, Rutter, Dilavore, Risi, Gotham, & Bishop, 2012) is an assessment tool for the diagnosis of ASD. The ADOS-2 consists of four modules; the module used is decided based on the individual's age and use of oral language. A doctoral level Ph.D. student administered this assessment.

Pre-, Post-, and Follow-up Standardized Measures

Repetitive Behaviour Scale-Revised (RBS-R). The RBS-R (Bodfish et al., 1999; Appendix B) is an assessment that measures the severity of repetitive behaviours. There are 43 items in total, which parents rate on a Likert-type scale ranging from 0 (*behaviour does not occur*) to 3 (*behaviour occurs and is a severe problem*). The questions are divided into six subscales including: stereotyped behaviour, restrictive behaviour, compulsive behaviour, self-injurious behaviour, ritualistic behaviour, and sameness behaviour. Consistent with previous research, only the sameness, ritualistic, and compulsive subscales were utilized. Further, these subscales were chosen as they measure the types of repetitive behaviours being targeted in treatment. Assessments took place at pre-treatment, post-treatment, and 7-to-9 months following treatment.

Child Yale-Brown Obsessive Compulsive Scale (CY-BOCS). The CY-BOCS (Goodman et al., 2006) is a 10-item clinician-rated semi-structured interview used to assess the severity of OCD symptoms experienced during the one-week period prior to the assessment. The CY-BOCS is used to rate the severity of both obsessions and compulsions on a five-point Likert-

type scale. In the present study, the CY-BOCS was administered at both pre- and post-assessments. However, given the difficulty with introspection experienced by individuals with ASD and to remain consistent with previous research, only the 5-item Compulsion score was used in the present study.

Child Obsessive-Compulsive Impact Scale – Revised Parent Version (COIS-RP). The COIS-RP (Piacentini, et al., 2007; Appendix C) is a 33-item parent report measure which assesses functional impairment over the past month related to obsessive-compulsive symptoms. Parents completed these questionnaires at baseline and post-treatment assessment sessions.

Behavioural Assessments Completed During Treatment

Parent OCB Rating Scale. Information for the Parent OCB Rating Scale (Vause et al., 2015) came from both the pre-assessment (e.g., RBS-R, CY-BOCS) and the initial baseline home visit. Questionnaires included a minimum of one question for each of the behaviours (more if deemed necessary) that were tracked throughout therapy (e.g., "Today, how long did it take [participant] to brush his teeth?"). Questions were presented on a 5-point Likert scale ranging from 1 (*desired OCB severity*) to 5 (*baseline OCB severity*). Parents completed these questionnaires daily during baseline, treatment, and follow-up.

CAPSI Therapy. CAPSI Therapy is a web-based program, described in the Introduction of this thesis, which incorporates mastery learning to teach or assess any number of skills, abilities, and knowledge. In the present study, parents were asked to complete six assignments between sessions 3 and the end of treatment. These assignments were each 3 questions in length and were graded by the CBT therapist. Although not utilized within the present study, CAPSI Therapy also offers the option for peer reviewing. Questions for each assignment were randomly

assigned from a bank of questions. In the present study, the questions were related to the material taught to the parents during their weekly parent training sessions.

Parent Interview for Assessing Function (PIAF). The PIAF (Guertin et al., 2016) is a behavioural assessment measure that contains 36 open-ended questions that consider antecedents, motivating operations, settings, and consequences associated with behaviour. The functions assessed include: (a) social positive reinforcement in the form of attention, (b) social positive reinforcement in the form of tangibles, (c) social negative reinforcement (i.e., escape/avoidance), and (d) automatic positive or negative reinforcement (Martin & Pear, 2019). The PIAF was completed for each of the behaviours prior to it entering the active treatment phase. This information was used when creating a plan for how the parent should respond when the behaviour occurred in the future.

Antecedent, Behaviour, Consequence Narrative Recording. ABC data were collected when feasible during weekly online sessions when compulsions occurred in front of the camera and during the initial baseline home visit and combined with results from the PIAF to determine hypothesized functions. This information was used when creating a plan for how the parent should respond when the behaviour occurred in the future.

Procedure

Data Collection

Data collected included standardized measures, parent report questionnaires (i.e., the Parent Rating Scale), six online CAPSI parent assignments, and two caregiver interviews. Standardized assessments and the Parent OCB Rating Scale both occurred at pre-treatment, post-treatment, and 7 to 9 months following treatment. The online CAPSI assignments were self-

paced and happened throughout treatment. The caregiver interviews occurred 15 to 18 months following the completion of treatment.

Pre-treatment

Participants and their parent(s) attended two assessment sessions. All assessments were administered by PhD graduate students. During the first session, the demographics questionnaire, WASI-II, and the ADOS-2 were completed. The second session included the administration of the COIS-RP, RBS-R, and the CY-BOCS. In addition, the ADI-R was completed over the phone. Following the assessment sessions, the assessor provided the CBT therapist (who was also the principal investigator) with a list of OCBs that the child was currently engaging in. This list of OCBs was obtained through the CY-BOCS (Goodman et al., 1986) and RBS-R (Bodfish et al., 1999). An initial in-person meeting was scheduled with the CBT therapist (Appendix D), child, and parent(s) in order to gather information to create their individualized Parent OCB Rating Scale. In combination with parent and child input, the initial list of OCBs was narrowed down to the top 10 behaviours (e.g., excessive handwashing, checking locks), which were tracked using the Parent OCB Rating Scale and depending on time, potentially targeted during therapy. The questions were presented on a Likert scale ranging from 1 (*desired OCB severity*) to 5 (*baseline OCB severity*). Upon receiving these individualized questionnaires, parents collected data for approximately 2 weeks prior to the commencement of therapy. The therapist made sure that the parents fully understood the questions before counting the data collection as baseline data. Descriptions of each of the five OCBs treated are provided in Tables 1 and 2 for Participants 1 and 2, respectively.

During treatment

Throughout treatment, parents were asked to collect data daily using the Parent OCB Rating Scale. This deidentified information was sent to the researcher electronically on a daily basis. Parents were also asked to complete six online CAPSI assignments while therapy was ongoing.

Post-treatment

Following treatment, participants and their parents attended another assessment session. During this session, the CY-BOCS, RBS-R, and COIS-RP were administered.

Follow-up

Follow-up data was collected for both children 7- to 9-months after their last treatment session. At this time, parents were asked to complete the RBS-R, and seven days' worth of the Parent OCB Rating Scale.

Table 1

Operational Definitions of Participant 1's Obsessive Compulsive Behaviours

OCB	Operational Definition
Evening Routine	Any instance when Participant 1 engaged in the following routine without any deviations in the order of the events listed (i.e., walked up the stairs with the cat in his arms, turned the cat around on the last step, took cat in the bathroom and set him on the floor, got into the shower on right side, washed his hair, asked his mother to check his hair, washed his body, got out of the shower on the left side).
Checking Locks	Any instance when Participant 1 placed his hand on the front doorknob, from inside or outside of the house, and pulled without entering or exiting the house.
Avoiding Knives	Any instance when Participant 1 refused to touch a knife or use a knife to cut an item.
Hoarding	The total number of bins of seemingly useless items that Participant 1 refused to part with.
Feeding Fish	Any instance when Participant 1 either fed his fish or asked his mother to feed his fish, at the exact same time each day.

Note. The target behaviours are listed in the order that they were treated; OCB = obsessive compulsive behaviour.

Table 2

Operational Definitions of Participant 2's Obsessive Compulsive Behaviours

OCB	Operational Definition
Handwashing	Any instance of Participant 2 washing his hands.
Avoiding Doorknobs	Any instance of Participant 2 either asking someone else to open a door for him or using a part of his body or clothing other than his hand (e.g., sleeve, foot).
Avoiding Touching the Garbage	Any instance of Participant 2 either asking someone else to open the garbage pail for him or using a part of his body or clothing other than his hand (e.g., sleeve, foot).
Saying "Sorry"	Any instance of Participant 2 saying "sorry".
Bathroom	Any instance of Participant two entering the bathroom.

Note. The target behaviours are listed in the order that they were treated; OCB = obsessive compulsive behaviour.

Caregiver Follow-up Interviews

The two parents who attended the weekly CBT sessions with their children were asked to participate in semi-structured interviews 15-18 months post-treatment. In addition, Participant 1's grandmother attended the interview with his mother. Throughout this paper, Participant 1's mother and grandmother are referred to as Mother 1 and Grandmother 1, respectively, and Participant 2's mother is referred to as Mother 2.These interviews were approximately 30 to 40 minutes in length and included questions related to their child's short-term and long-term successes and challenges with the treatment program and the impact that the COVID-19 pandemic has had on their child's OCBs. This last aspect was not planned, but serendipitously took advantage of a naturally occurring phenomenon (the pandemic) to examine the impact of this phenomenon on arguably related behaviour.

Online Delivery

The online delivery included two broad components: (1) a weekly virtual WebEx therapy session where the child, at least one parent, and the therapist met for up to one hour; (2) CAPSI Therapy. The latter was utilized as part of the parent-training component. Parents were asked to complete 6 unit assignments based on material learned during parent training phone calls.

CBT Treatment Package

The present study utilized a manualized CBT treatment package titled "*I Believe in Me, not OCB*" that includes both a child's workbook (Vause et al., 2013b) and a clinician's manual (Vause et al., 2013a). This treatment package builds on the work of March and Mulle (1998) and is specifically adapted to meet the needs of children with ASD (e.g., repetitive, emphasizes visuals, incorporates children's interests). This package was initially developed and tested using a group face-to-face format and was adapted for Internet-delivered individualized therapy, for

the purposes of the present study. As a result of the manual being delivered individually, each of the nine sessions took up to one hour rather than the 2-hour weekly sessions that took place when done as a group. This treatment package involved a number of treatment components (e.g., awareness training). Each of these components are outlined below.

Awareness Training (AT)

The first two-and-a-half treatment sessions focused on building rapport, discussing rules, introducing the concepts of CBT and OCB (Appendix E), rating anxiety associated with OCBs using a thermometer (Appendix F), and mapping perceived control over OCBs (Appendix A). Given that the children had ASD, topics such as interference were taught in a concrete way (Appendix G). Repetition is also an important component of this treatment package. For instance, children physically mapped their OCBs with sticky notes on a 3-section scale: (a) I'm the boss, (b) sometimes I'm the boss and sometimes OCB's the boss, or (c) OCB's always the boss. These maps were revisited and revised throughout the course of treatment as progress was made (see Appendix A).

Individualized Treatment of OCBs

This phase of treatment is considered to be the active treatment component. Starting in session 3, the participant, the participant's family, and the therapist began actively working on specific OCBs. One OCB is added for each participant in session 3 and then zero to two OCBs are added each session, thereafter, depending on family comfort and progress. Target behaviours were selected from the 10 behaviours on the Parent OCB Rating Scale. The target behaviour(s) were chosen with input from the family (i.e., behaviours that are negatively impacting their quality of life), as well as looking for a stable baseline. The following four sections provide additional details regarding how OCBs are targeted using this treatment package.

Function-based Assessment and Intervention

The therapist attempted to determine the perceived functions (e.g., attention, tangible, escape) of each OCB that would be addressed, in order to better instruct the caregivers how they should respond when the behaviour occured (Martin & Pear, 2019). For instance, if a behaviour is hypothesized to be maintained by attention, giving that behaviour additional attention would likely increase the frequency of the behaviour. The therapist assessed the functions of the OCBs using a combination of the PIAF and ABC narrative recording (when possible). The PIAF was administered one-week prior to the OCB being actively treated (i.e., introduced to ERP). The therapist relayed the information gathered from these assessments to the parents during the weekly parent training meetings.

ERP and Positive Reinforcement

Together the child, parent, and therapist developed a plan where the child gradually exposed themself to the anxiety-provoking situation without engaging in the compulsion (e.g., touching a door handle without washing their hands). These plans were written on a 'Stairs of Learning' worksheet (Appendix H) and a reinforcement schedule was negotiated between the parent and child during sessions. These plans would include at least one planned exposure per day, for each OCB that they are currently working on. While parents were encouraged to use immediate reinforcement when possible, delayed reinforcement was used as well. Each participant was also provided with a bag of 9 treats. They were given points throughout the session and allowed a treat from the bag once they reached 10.

Cognitive and Behavioural Strategies

Once the specific OCB was selected for introduction, in addition to a treatment plan (e.g., ERP and positive reinforcement) being developed, the child was also taught how to "boss back

OCB". This was done by using a variety of externalizing statements (e.g., hit the road OCB), positive self-statements (e.g., I can boss back OCB), as well as challenging assumptions (e.g., "washing my hands too often makes my hands bleed and washes away the good germs" or "my mom does not wash her hands after touching a pencil and she does not get sick more than I do."). Other more concrete strategies such as pro/con lists were utilized, as well as activities to increase motivation as needed. The extent to which cognitive restructuring was utilized depended on the individual child. In situations where the child was not able to articulate a specific intrusive thought (i.e., obsession), additional behavioural strategies were used.

Relapse Prevention

During the last session, the therapist, participant, and their parent discussed relapse prevention. Specifically, the CBT therapist reviewed the strategies that were the most effective for that child, as well as possible times when OCBs may re-emerge. In addition to discussing it in session, this topic was also reviewed during the weekly parent training session.

Parent Training

Parent training took place weekly over the phone. Parent training lasted approximately 30 minutes per week, and included topics such as: reinforcement, functions maintaining behaviour, cognitive restructuring, and relapse prevention. During parent training time, parents and the therapist discussed specific strategies for treating the behaviours that the child was currently working on. This included discussing plans for how to respond to the behaviours in light of the perceived function found using the PIAF. This was also a time when the parent and the therapist were able to problem-solve challenges that arose throughout the week. After weeks 3 to 8 of parent training, parents were asked to complete weekly assignments using CAPSI Therapy. Each assignment was three questions in length and was graded by the therapist as either a "pass" or a

"restudy". Although these assignments were self-paced, the therapist prompted the parents during the weekly parent training sessions to complete their CAPSI assignments.

Results

Parent OCB Rating Scale

Figure 1 shows the results of Participant 1's CBT treatment across five OCBs, using a multiple baseline design. As expected, no change was observed during the AT phase of treatment for the first four OCBs (i.e., evening routine, checking locks, avoiding knives, and hoarding). The fifth OCB (i.e., feeding fish) showed an increase in variability prior to ending the AT phase. The evening routine, checking locks, avoiding knives, hoarding, and feeding fish were introduced into the individual treatment phase during sessions 3, 4, 5, 6, and 7, respectively. As expected, all five OCBs demonstrated an improvement after being introduced into the individual treatment phase. This drop was immediate for checking locks, avoiding knives, and feeding fish. The change was more gradual for Participant 1's evening routine and hoarding OCBs. All five of Participant 1's OCB's decreased to desired post-treatment levels by the end of the ninth week of treatment. In addition, all OCBs maintained some improvement 7-months following treatment, with 80% of the OCBs remaining at post-treatment levels. Table 3 further summarizes these results by providing Parent OCB Rating Scale values for each OCB, across the four treatment phases (i.e., baseline, AT, individual treatment, and 7-month follow-up). Given the gradual nature of treating OCB's using this treatment manual, the means provided in Table 3 were calculated using the last three data points of each phase.

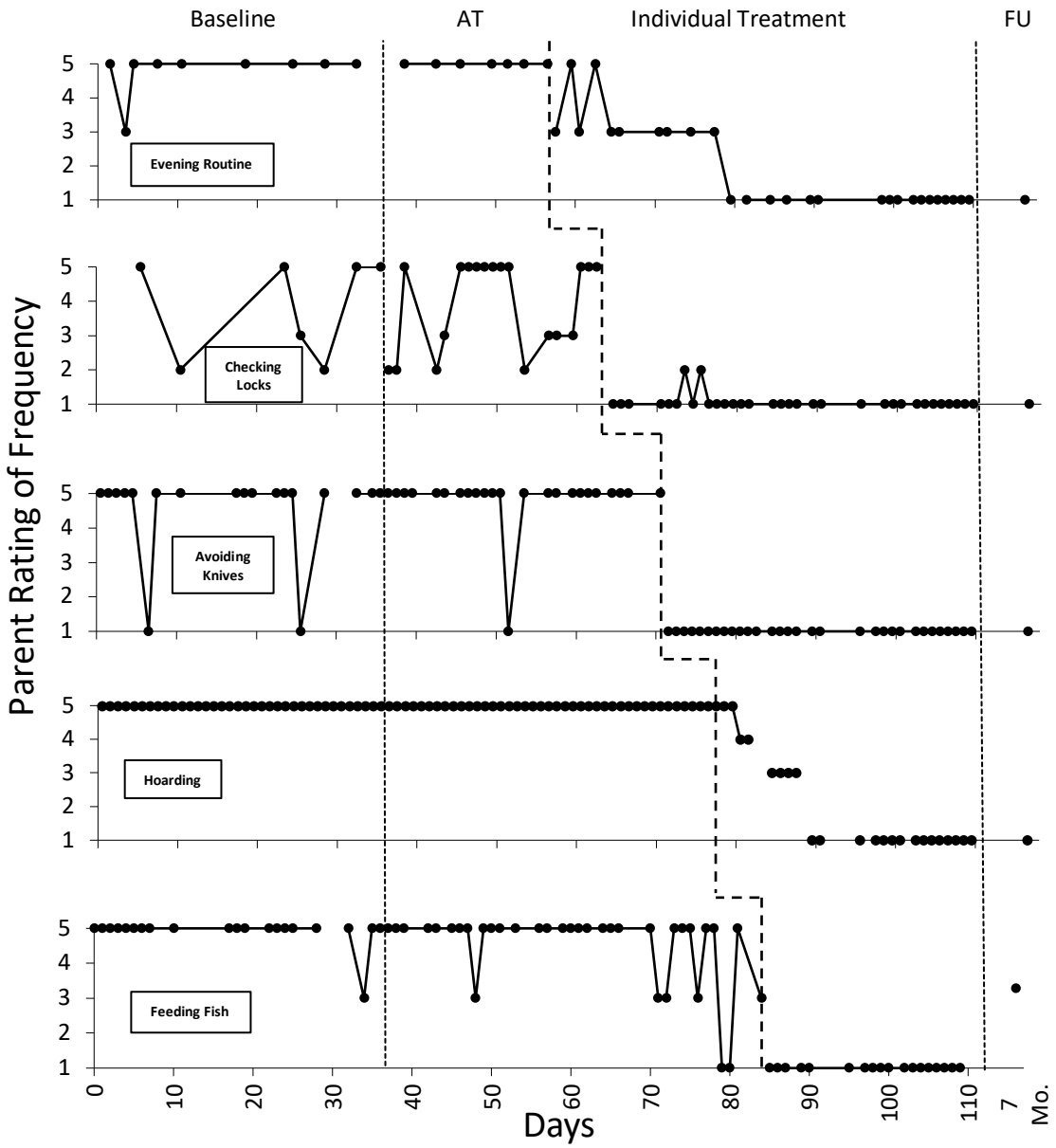

Figure 1. Parent rating of the frequency of five behaviours for Participant 1 across baseline, awareness training (AT), individual treatment, and 7-months follow-up.

Table 3

Participant 1's Mean OCB Severity Ratings Across Baseline, Awareness Training (AT), Individual Treatment, and 7-month Follow-up

Behaviour	Baseline	AT	Treatment	FU
Evening Routine	5	5	1	1
Checking Locks	4	5	1	1
Avoiding Knives	5	5	1	1
Hoarding	5	5	1	1
Feeding Fish	4.33	3	1	3

Note. AT = Awareness Training; Treatment = Active treatment component including Exposure Response Prevention; FU = Follow-up. Values were generated by calculating the mean of the last three data points of each treatment phase, for each OCB. Scores range from 1 (*desired OCB severity*) to 5 (*baseline OCB severity*).

Figure 2 shows the results of Participant 2's CBT treatment across five OCBs, using a multiple baseline design. As anticipated, there was minimal change observed during the AT treatment phase. However, some improvement was observed during the AT phase for handwashing and repeatedly using the bathroom. Handwashing, avoiding doorknobs, avoiding the garbage, saying 'sorry', and repeatedly using the bathroom were introduced into the individual treatment phase during sessions 3, 5, 5, 7, and 8, respectively. All five behaviours demonstrated a reduction in scores during the individual treatment phase when compared to both the baseline and AT phases. This decrease was relatively immediate for avoiding doorknobs, avoiding touching the garbage, and repeatedly saying "sorry", and more gradual for excessive handwashing, and using the bathroom. All five OCBs demonstrated an improvement by the end of treatment, with 80% of OCBs decreased to desired levels. Additionally, all five OCBs maintained some or all of their progress when assessed 9-months following treatment. Further, 60% of Participant 2's OCBs were at desired levels at 9-months post-treatment. Table 4 further summarizes these results by providing values for each OCB, across the four treatment phases (i.e., baseline, AT, individual treatment, and 9-month follow-up). Given the gradual nature of treating OCB's using this treatment manual, the means provided in Table 4 were calculated using the last three data points of each phase.

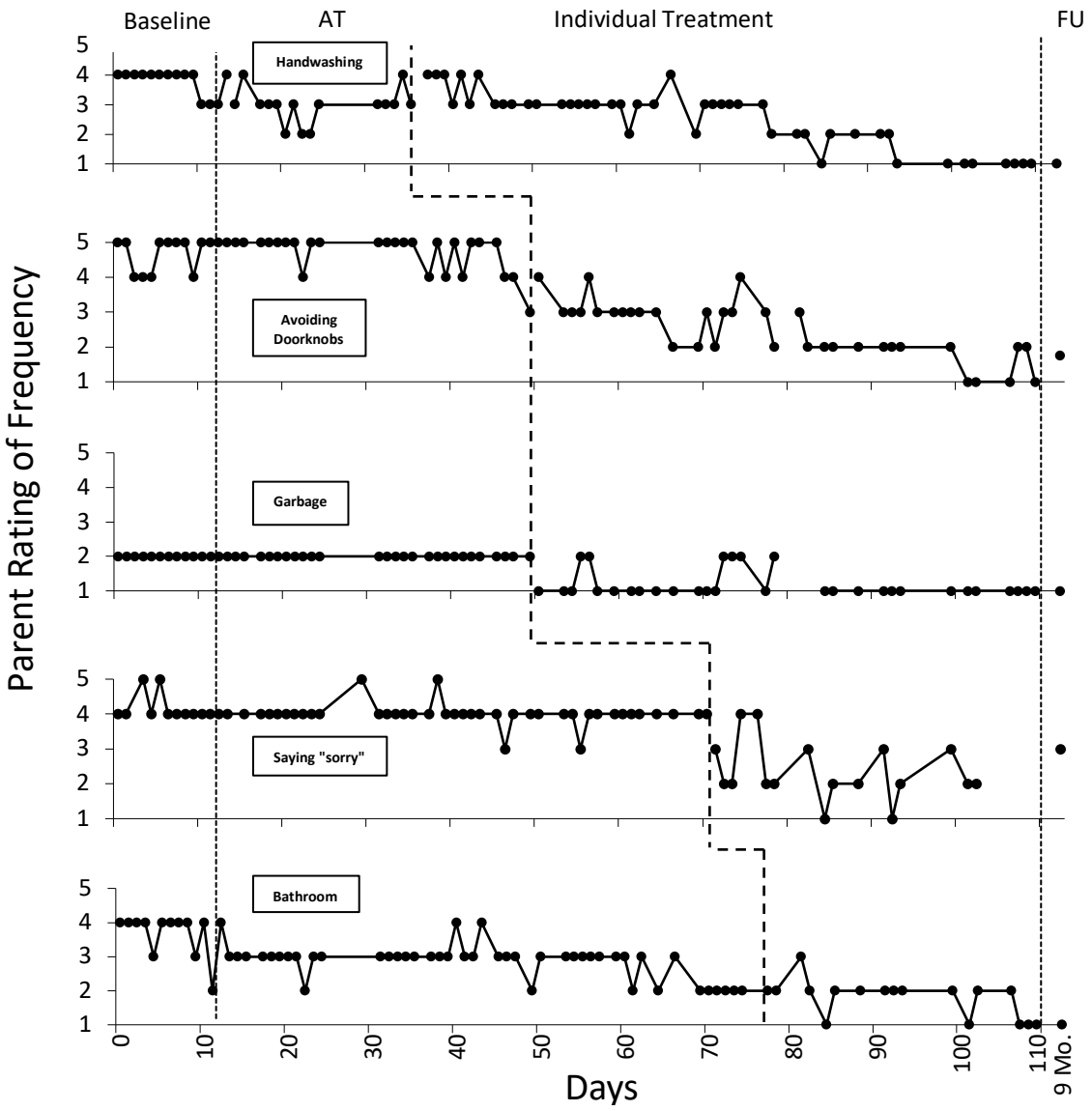

Figure 2. Parent rating of the frequency of five behaviours for Participant 2 across baseline, awareness training (AT), individual treatment, and 9-months follow-up.

Table 4

Participant 2's Mean OCB Severity Ratings across Baseline, Awareness Training (AT), Individual Treatment, and 7-month Follow-up

Behaviour	Baseline	AT	Treatment	FU
Handwashing	3	3.33	1	1
Avoid Doorknobs	5	4.33	1.67	2
Avoid Garbage	2	2	1	1
Saying "sorry"	4	4	2.33	3
Bathroom	3.33	2	1	1

Note. AT = Awareness Training; Treatment = Active treatment component including exposure response prevention; FU = Follow-up. Values were generated by calculating the mean of the last three data points of each treatment phase, for each OCB. Scores range from 1 (*desired OCB severity*) to 5 (*baseline OCB severity*).

Pre/Post Results

Both participants completed a number of treatment outcome measures prior to treatment, post-treatment, and 7 to 9 months following treatment. Table 5 summarizes Participant 1's results from these assessments across the three treatment phases (pre-treatment, post-treatment, and follow-up). A reduction was observed between pre-treatment and post-treatment across all measures. The RBS-R 7-month follow-up shows an increase from post-treatment; however, this score remains well below pre-treatment levels.

Table 6 summarizes the results for Participant 2 across the two treatment phases. Note that Participant 2's parents did not complete the RBS-R at follow-up. At post-treatment, a minimal decrease was reported on the RBS-R as well as the CY-BOCS compulsions subscale. However, a significant increase on the COIS-RP was reported.

Table 5

Treatment Response for Participant 1 Across Pre-treatment, Post-treatment, and 7-month Follow-up

	Pre	Post	FU
Total score for RBS-R (sameness, ritualistic, and compulsive subscales)	41	10	17
RBS-R 1-100 score	75	50	NA
Total score for CY-BOCS - compulsions	17	10	NA
Total score for COIS-RP	59	31	NA

Note. Pre = Pre-treatment; Post = Post-treatment; FU = Follow-up; RBS-R = Repetitive Behaviors Scale – Revised; CY-BOCS = Children's Yale-Brown Obsessive Compulsive Scale; COIS-RP = Child Obsessive-Compulsive Impact Scale – Revised Parent

Table 6

Treatment Response for Participant 2 Across Pre-treatment, Post-treatment, and 7-month Follow-up

	Pre	Post	FU
Total score for RBS-R (sameness, ritualistic, and compulsive subscales)	17	13	NA
Total score for CY-BOCS - compulsions	13	11	NA
Total score for COIS-RP	15	28	NA

Note. Pre = Pre-treatment; Post = Post-treatment; FU = Follow-up; RBS-R = Repetitive Behaviors Scale – Revised; CY-BOCS = Children's Yale-Brown Obsessive Compulsive Scale; COIS-RP = Child Obsessive-Compulsive Impact Scale – Revised Parent

CAPSI Results

Parents were asked to complete six CAPSI Therapy assignments throughout treatment, corresponding to material taught during the parent training components in sessions 3 to 8. Both parents were prompted to complete assignments throughout treatment. Participant 1's mother completed and passed all six assignments, without any restudies. Participant 2's father submitted two CAPSI assignments but received restudies on both due to one or more of the three questions being left blank.

The possible questions that the parents could receive varied from asking them to provide a list of answers to asking them to provide an example describing how they used a specific skill with their child. For instance, when Participant 1's mother was asked, "why is it important to work on OCBs in all settings?", she responded "To allow the person to be adaptable in different situations as well as cope in different situations". Given the significant time commitment needed for participants and their families to fully commit to this study, as well as previous feedback that parents found the data collection onerous, no pre-post assessment on parent knowledge were completed.

Caregiver Interviews

Participant 1's mother (i.e., Mother 1) and grandmother (i.e., Grandmother 1), and Participant 2's mother (i.e., Mother 2) all participated in semi-structured interviews with the CBT therapist 15- to 18-months post-intervention. Mother 1, Grandmother 1, and Mother 2 all shared their thoughts and experiences related to the strengths and weaknesses of the treatment program. They also described whether their children were able to maintain their progress after their treatment, as well as the impact that the COVID-19 pandemic has had on their child and family more generally.

Successes and Benefits of the Program

When asked about their overall feelings regarding the treatment program, the three caregivers responded positively. Mother 2 described "definite improvements" and stated, "we were happy with the whole thing", while Mother 1 and Grandmother 1 shared their feelings that the program was "effective". Grandmother 1 described her grandson as having learned "good coping skills" for his anxiety and they all described the consistency, structure, exposures, and weekly Internet-delivered sessions as having the greatest impact on their children. Grandmother 1 also added that "the inclusion of [Participant 1] and making him accountable" was vital to his overall success. Specifically, Grandmother 1 and Mother 1 both shared that they felt that this was partly achieved when the therapist would give Participant 1 weekly homework assignments, and then review them at the start the following session. They described this increased independence and autonomy as having generalized to other areas of his life.

In addition to the benefits that their children experienced, all three caregivers, without prompting, described a number of benefits that they felt that they had received from participating in the program. Mother 2 stated that "both of us [i.e., Mother 2 and Father 2] have become more patient and understanding with it … [we] understand that it's not his fault". Grandmother 1, Mother 1, and Mother 2 all described an increase in awareness regarding OCBs as well as their roles in reinforcing the cycle of anxiety. Specifically, Grandmother 1 stated, "we realized that the amount of things that we were doing for him wasn't beneficial for him in the long run." She also noted that their experience with the program "taught us to step back".

Challenges with the Program

Although Mother 2 stated that "there's not really anything [about the program] that I would change", she did share that Participant 2 did not like doing his exposures (specifically

"touching things") or having to talk about his OCBs weekly. When Grandmother 1 and Mother 1 were asked, they responded that Participant 1 did not have any challenges with the program. However, Mother 1 did note that given the social challenges faced by children with ASD, having some of the sessions in person may be a benefit.

Maintenance

Given the potential significance of the COVID-19 pandemic for OCBs, the caregivers were asked about maintenance of the program both prior to the pandemic and during the pandemic, separately. This section summarizes their responses for the pre-pandemic period. A discussion related to their experiences during the pandemic is presented below. Overall, all three caregivers reported that their respective children were able to maintain their progress between the end of treatment and the start of the pandemic. Mother 1 and Grandmother 1 shared that Participant 1 had both continued to maintain his progress and generalized the skills that he had learned in therapy to other areas of his life. Mother 2, Mother 1, and Grandmother 1 also all shared that they continued with the rewards and exposures post-treatment. Although all of the caregivers described success in maintaining their child's progress post-treatment, they also noted some challenges in doing so. Both families described "life" and "work" as getting in the way. Further, Mother 2 shared that "although [ex-husband] and I try to do the same thing, we are two separate houses".

Impact of COVID-19

The three caregivers all described COVID-19 as particularly challenging for their family. Mother 2 noted that they (i.e., herself and Participant 2's father) were able to maintain Participant 2's progress from the treatment until COVID-19 hit. She shared that his struggle with COVID-19 was "more gradual". "He was enjoying it at first … this is like his Super Bowl –

unlimited handwashing and covering his face". Mother 2 described feeling like the lack of structure and consistency contributed too his struggles. Similarly, Mother 1 found the change in routine challenging. Mother 2 also shared her feeling that exposures during the pandemic were particularly challenging stating, that "if you touch a door they want you to put on hand sanitizer".

Although the sample size is not large enough to make any large-scale generalizations, the caregivers from this study reported that OCBs related to germs and/or contamination were significantly more impacted by the COVID-19 pandemic compared to other OCB categories. Mother 2 described her son as "very paranoid about COVID" and stated that "COVID has made it even worse for the germs fear". She recalled recent incidents where Participant 2 "walk[ed] around the house with his shirt up over his nose" and expressed concern that she was breathing on him when she was standing close. Mother 2 shared that this concern is impacting school as well. Specifically, he recently did poorly in his cooking course because he was unwilling to touch the food. Although Participant 1 did not have any contamination OCBs, Mother 1 did note some anxiety related to COVID-19.

Both families described a number of other concerns which they connected to the COVID-19 pandemic. Although these concerns were not directly connected to their OCBs, the caregivers described them as indirectly having an impact on their ability to successfully maintain their child's treatment successes. Mother 2, Mother 1, and Grandmother 1 all described the lack of social interactions that their children have had since the pandemic began as a concern for them. Mother 1 noted that her son increasingly refused to engage with other people, including family members. Grandmother 1 shared that they "are both concerned about how it's going to be when the world gets back too normal" given his ASD diagnosis. Mother 2 added that "it's been extremely challenging. The online learning is a nightmare for him." Further, she shared that

Participant 2 has been much less independent with his virtual schoolwork than she had initially expected that he would be.

Discussion

A growing body of literature has evaluated the effectiveness of various CBT programs to treat OCBs in children and adolescents with ASD (IQ >70), finding statistically significant reductions in OCB (e.g., Farrell et al, 2012; Vause et al. 2020). For instance, Vause et al. (2020) found that the treatment package utilized in the present study yielded large effect sizes when delivered using an in-person group (up to four children) model. Comer et al. (2017) found similar results when treating OCD in typically developing children using an online format. However, there has not been any known previous research which has treated OCBs in children with ASD using an Internet-delivered format. The present study aimed to fill this gap in research. More specifically, the present study (a) evaluated the effectiveness of a manualized Internet-delivered treatment package to treat OCBs in two children with ASD and (b) interviewed three of the children's caregivers in order to better understand both the strengths and weaknesses of the program as well as the impact of the COVID-19 global pandemic on the children and their families.

There were a number of interesting results found in the present study. The primary measure was the daily report Parent OCB Rating Scale. Consistent with previous in-person research (Neil et al, 2017; Vause et al., 2020) of this same manualized treatment, we found reductions in all 10 behaviours that we treated across the two participants (see Figure 1 and Figure 2). Although this research is preliminary, it provides some evidence to suggest that Internet-delivered CBT may be an effective way to treat OCBs in 12- to 13-year-old males with ASD (IQ >70). Interestingly, the behaviour that was the most treatment resistant, remaining

present during post-treatment and 9-months following treatment, was a verbal OCB: specifically, Participant 2 saying "I'm sorry" repeatedly. Given the more cognitive, and less concrete nature of this OCB, it is possible that some children with ASD may struggle more with verbal OCBs. Conversely, the OCBs that the treatment appeared to be most successful with were OCBs that were more concrete with clear times and/or objects associated with them (e.g., checking locks, feeding fish, avoiding garbage).

Table 5 and Table 6 provided a summary of the standardized assessment scores for Participant 1 and Participant 2, respectively. Interestingly, both anecdotally and according to the high frequency of behaviours on the Parent OCB Rating Scale, Participant 2 was more impaired by OCBs than Participant 1. However, the standardized pre-assessment scores suggest otherwise. This is particularly important given the minimal improvement (and even increase) reported between pre-treatment and post-treatment on Participant 2's standardized measures. These results on the standardized measures are inconsistent with the Parent OCB Rating Scale (see Table 4). One possible explanation for this discrepancy is that the standardized pre-assessment underrepresents his level of impairment, and that the family's awareness increased during their time in treatment.

In addition to weekly parent training (over the phone), parents were asked to complete six CAPSI assignments. One challenge encountered was that one parent did not complete all of the assignments. Conaughton et al. (2017) described a similar struggle with lower compliance rates of asynchronous treatment components for families of children with ASD. This may be partially due to the self-paced nature of these assignments but may have also been compounded by the complex living situation of this family. Interestingly, the child of the caregiver who completed all of the CAPSI assignments maintained more of their treatment gains 7-months following

treatment. It is impossible to know whether this success can be attributed to the completion of the CAPSI assignments, other variables such as living arrangements, or generally committing more time to the treatment. One possible way of addressing this (i.e., incomplete assignments) is to ask all parents to complete CAPSI assignments in the future, rather than just one parent per child. Some families may also benefit from due dates being given for each assignment (e.g., each CAPSI assignment is due by the beginning of the following session).

Overall, during the interviews the caregivers described being satisfied with the program, with one family describing it as "effective". While, both families shared that the program helped them to better understand OCB, Participant 2's mother described challenges with remaining consistent between households as contributing to their difficulty maintaining progress. Participant 2 made notably less improvements during treatment and had more difficulty maintaining his progress both post-treatment and during the pandemic. As noted above, Participant 2's father was also the parent who did not complete the CAPSI unit assignments. Perhaps this difference in custodial arrangements contributed to this difference in treatment outcome. Further, in future similar situations, this may warrant having both parents at sessions.

With respect to the COVID-19 pandemic, while Participant 1's mother described the change in routine due to the pandemic as a challenge, Participant 2's mother described Participant 2 as being in his element during the beginning of the pandemic due to the requirements to wear masks and wash hands frequently. However, over time, Participant 2's worries related to germs increased significantly, impacting both his home and school life. Interestingly, these differences are consistent with the OCB categories that each participant presented with during treatment. More specifically, Participant 2 presented with several OCBs related to germs and contamination, whereas Participant 1 presented with a number of OCBs

related to needing to follow a specific routine. Not surprisingly, OCBs related to germs and contamination appeared to increase throughout the virus pandemic. It is possible that this is at least partly due to the real threat of getting sick, and perhaps partly due to health organizations currently promoting the behaviours that we spent several weeks in therapy extinguishing (e.g., excessive handwashing, covering his face to avoid germs).

Benefits and Challenges of Online Therapy

It is noteworthy that, although delivering therapy in an online format has a number of advantages, such as increased accessibility and cost effectiveness, it also comes with a number of challenges. Access to high quality technology and stable internet access is not something that everyone has. Not having access to a computer or tablet can make Internet-delivered therapy inaccessible to many of the people and communities who need it the most. A poor internet connection can also result in cancelled sessions and situations where the participant and/or therapist are unable to see and hear each other. It can also be challenging to remove distractions for the participant when the therapy session is happening in their homes. Due to space limitations, many of our therapy sessions happened from the participant's living room or dining room table. It is ideal, but not always feasible, for the participant to have a distraction-free space for sessions.

It was also observed that it could initially be more challenging to develop a strong therapeutic relationship over the Internet and therapy tools could be more limited. For instance, we know that making concepts concrete is important when teaching children with ASD; however, many of these learning activities require additional material (e.g., Play-Doh to build and crush an 'anxiety monster'). Individual online therapy also lacks the social element that an in-person format provides. On one hand, a group of children can serve as an unnecessary

distraction for the individual group members, but on the other hand, having other group members with similar challenges can make participants feel less alone with their struggles. Lastly, because parents were not being seen weekly in person, it was observed that, at times, data collection was more inconsistent and required more prompts. This was true for both the daily parent questionnaires, as well as the weekly CAPSI assignments. In fact, one of the two parents did not complete all of the CAPSI assignment by the conclusion of the study.

Limitations

There are several limitations to the present study that should be mentioned. First, due to the COVID-19 pandemic starting during data collection, sampling had to be cut short and hence the sample size is small. Although a number of conclusions were drawn based on the multiple baseline research design and caregiver interviews, only tentative conclusions about the effectiveness of this treatment package when delivered using an Internet-delivered format could be made. The limited sample size also meant that the sample lacked diversity; in particular, we did not have any female participants and we had a very limited age range of participants (i.e., 12-13 years of age). As a result, we cannot comment on how effective this intervention could potentially be for younger children or females with ASD.

Second, although we discussed with parents and participants how to successfully generalize the skills learned into the classroom, we did not directly contact the school or formally assess whether the progress made during therapy had transferred to the school. We made the choice to not do this in the present study due to both time and resource limitations. Also, several of the sessions were completed over the summer when the participants were not attending school.

Third, due to limited resources, the caregiver interviews were completed by the principal investigator, who also was the CBT therapist for both families. This may have been a limitation as it is possible that the caregivers would be less likely to verbalize the parts of the study that they disliked when speaking to their child's CBT therapist.

Finally, we did not formally assess parent knowledge before or after the parent training component or the CAPSI weekly assignments. In the present study, we made the choice not to include an additional assessment due to previous feedback from caregivers that the assessment process was already fairly onerous in addition to the time commitment required for the therapy component. However, this type of assessment could provide valuable feedback on how effective the parent training component is and whether additional parent training sessions are warranted.

Future Research

There are at least four directions future research could take. First, given the largely positive results from the present study, a larger randomized controlled trial with a waitlist control group is warranted. This would allow for the use of higher order inferential statistical analyses to better understand the variance explained by variables such as sex, age, and OCB response class.

Second, given the large number of OCBs that many of these children have (as found on the RBS-R and CY-BOCS assessments), future research could include a longer CBT protocol to treat more behaviours per participant. The current manual only includes 9 sessions, whereas other CBT manuals often include 12 or more sessions.

Third, in the present study, CAPSI's peer review component was not utilized. This decision was made because there were not enough participants completing the sessions at approximately the same time. However, future research with more participants and therapists running sessions simultaneously should consider using the peer review component. This feature

may help parents to cement the parent training content. In addition, it may be useful to create a parent training manual that parents can read and refer back to, which could be uploaded to CAPSI.

Fourth, due to previous parent feedback in previous studies that the assessments for this study felt onerous to the parents, a pre/post assessment of parent knowledge was not included in the present study. However, given the significant role that parents of children and youth with ASD play, this type of an assessment may be warranted. This would allow future researchers to make changes to the parent training, as needed.

Conclusion

The high comorbidity rates found between ASD and OCB combined with the many acknowledged barriers to accessing mental health resources in Canada makes it particularly important to develop treatments that are easily accessible and effective. The present study provides preliminary evidence to suggest that Internet-delivered CBT may be an effective treatment option for children with ASD (i.e., IQ >70) and OCB. Future research should continue to explore the use of Internet-delivered treatments for this population with larger and more diverse characteristics.

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Appendix A

Mapping OCBs

Me Zone	OCD/ME Zone	OCD Zone

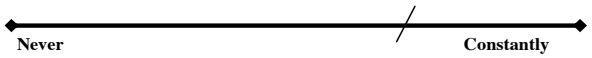
Appendix B

REPETITIVE BEHAVIOR SCALE – Revised (RBS-R)

Instructions:
Please rate this person's behavior by reading each of the items listed and then choosing the score that best describes how much of a problem the item is for the person. Be sure to read and score all items listed. Make your ratings based on your observations and interactions with the person over the last month. Use the definitions in the box given below to score each item.

0 = behavior does not occur
1 = behavior occurs and is a mild problem
2 = behavior occurs and is a moderate problem
3 = behavior occurs and is a severe problem

At the end of each section, there will be three questions asking you to rate that section's behaviors in terms of (a) how frequently they occur, (b) how upset the person becomes when repetitive behaviors are interrupted, and (c) how much the behaviors interfere with ongoing events. You will indicate the score by marking along each line, which represents a range of frequencies and severities. For example, if this person does those behaviors many times a day you may put the mark quite close to the right side:



I. Stereotyped Behavior Subscale

(DEFINITION: apparently purposeless movements or actions that are repeated in a similar manner)

1	WHOLE BODY (Body rocking, Body swaying)	0	1	2	3
2	HEAD (Rolls head, Nods head, Turns head)	0	1	2	3
3	HAND/FINGER (Flaps hands, Wiggles or flicks fingers, Claps hands, Waves or shakes hand or arm)	0	1	2	3
4	LOCOMOTION (Turns in circles, Whirls, Jumps, Bounces)	0	1	2	3
5	OBJECT USAGE (Spins or twirls objects, Twiddles or slaps or throws objects, Lets objects fall out of hands)	0	1	2	3
6	SENSORY (Covers eyes, Looks closely or gazes at hands or objects, Covers ears, Smells or sniffs items, Rubs surfaces)	0	1	2	3

Please answer the following questions about the behaviors described above (put a vertical mark (|) on the line to show your answer):

How **often** do they happen?
(If *Never, skip to Section II)*
Never — **Constantly**

How **upset** does this person get when interrupted?
Not at all — **Extremely**

How much do these behaviors **get in the way of ongoing events?**
Not at all — **Severe interference**

0 = behavior does not occur 1 = behavior occurs and is a mild problem 2 = behavior occurs and is a moderate problem 3 = behavior occurs and is a severe problem

II. Self-Injurious Behavior Subscale

(DEFINITION: movement or actions that have the potential to cause redness, bruising, or other injury to the body, and that are repeated in a similar manner)

7	HITS SELF WITH BODY PART (Hits or slaps head, face, or other body area)	0	1	2	3
8	HITS SELF AGAINST SURFACE OR OBJECT (Hits or bangs head or other body part on table, floor or other surface)	0	1	2	3
9	HITS SELF WITH OBJECT (Hits or bangs head or other body area with objects)	0	1	2	3
10	BITES SELF (Bites hand, wrist, arm, lips or tongue)	0	1	2	3
11	PULLS (Pulls hair or skin)	0	1	2	3
12	RUBS OR SCRATCHES SELF (Rubs or scratches marks on arms, leg, face or torso)	0	1	2	3
13	INSERTS FINGER OR OBJECT (Eye-poking, Ear-poking)	0	1	2	3
14	SKIN PICKING (Picks at skin on face, hands, arms, legs or torso)	0	1	2	3

Please answer the following questions about the behaviors described above (put a vertical mark (/) on the line to show your answer):

How **often** do they happen?
(If *Never, skip to Section II)*

Never ——— **Constantly**

How **upset** does this person get when interrupted?

Not at all ——— **Extremely**

How much do these behaviors **get in the way of ongoing events?**

Not at all ——— **Severe interference**

0 = behavior does not occur 1 = behavior occurs and is a mild problem 2 = behavior occurs and is a moderate problem 3 = behavior occurs and is a severe problem

III. Compulsive Behavior Subscale

(DEFINITION: behavior that is repeated and is performed according to a rule, or involves things being done "just so")

15	ARRANGING / ORDERING (Arranges certain objects in a particular pattern or place; Need for things to be even or symmetrical)	0	1	2	3
16	COMPLETENESS (Must have doors opened or closed; Takes all items out of a container or area)	0	1	2	3
17	WASHING / CLEANING (Excessively cleans certain body parts; Picks at lint or loose threads)	0	1	2	3
18	CHECKING (Repeatedly checks doors, windows, drawers, appliances, clocks, locks, etc.)	0	1	2	3
19	COUNTING (Counts items or objects; Counts to a certain number or in a certain way)	0	1	2	3
20	HOARDING/SAVING (Collects, hoards or hides specific items)	0	1	2	3
21	REPEATING (Need to repeat routine events; In / out door, up / down from chair, clothing on/off)	0	1	2	3
22	TOUCH / TAP (Need to touch, tap, or rub items, surfaces, or people)	0	1	2	3

Please answer the following questions about the behaviors described above (put a vertical mark (/) on the line to show your answer):

How **often** do they happen?
(If *Never, skip to Section II)*

Never ——————————— **Constantly**

How **upset** does this person get when interrupted?

Not at all ——————————— **Extremely**

How much do these behaviors **get in the way of ongoing events?**

Not at all ——————————— **Severe interference**

0 = behavior does not occur 1 = behavior occurs and is a mild problem 2 = behavior occurs and is a moderate problem 3 = behavior occurs and is a severe problem

IV. Ritualistic Behavior Subscale

(DEFINITION: performing activities of daily living in a similar manner)

23	EATING / MEALTIME (Strongly prefers/insists on eating/drinking only certain things; Eats or drinks items in a set order; Insists that meal related items are arranged in a certain way)	0	1	2	3
24	SLEEPING / BEDTIME (Insists on certain pre-bedtime routines; Arranges items in room "just so" prior to bedtime; Insists that certain items be present with him/her during sleep; Insists that another person be present prior to or during sleep)	0	1	2	3
25	SELF-CARE – BATHROOM AND DRESSING (Insists on specific order of activities or tasks related to using the bathroom, to washing, showering, bathing or dressing; Arranges items in a certain way in the bathroom or insists that bathroom items not be moved; Insists on wearing certain clothing items)	0	1	2	3
26	TRAVEL / TRANSPORTATION (Insists on taking certain routes/paths; Must sit in specific location in vehicles; Insists that certain items be present during travel, e.g., toy or material; Insists on seeing or touching certain things or places during travel such as a sign or store)	0	1	2	3
27	PLAY / LEISURE (Insists on certain play activities; Follows a rigid routine during play / leisure; Insists that certain items be present/available during play/leisure; Insists that other persons do certain things during play)	0	1	2	3
28	COMMUNICATION / SOCIAL INTERACTIONS (Repeats same topic(s) during social interactions; Repetitive questioning; Insists on certain topics of conversation; Insists that others say certain things or respond in certain ways during interactions)	0	1	2	3

Please answer the following questions about the behaviors described above (put a vertical mark (/) on the line to show your answer):

How **often** do they happen?
(If *Never, skip to Section II)*

Never ——————————— **Constantly**

How **upset** does this person get when interrupted?

Not at all ——————————— **Extremely**

How much do these behaviors **get in the way of ongoing events?**

Not at all ——————————— **Severe interference**

0 = behavior does not occur 1 = behavior occurs and is a mild problem 2 = behavior occurs and is a moderate problem 3 = behavior occurs and is a severe problem

V. Sameness Behavior Subscale

(DEFINITION: (resistance to change, insisting that things stay the same)

29	Insists that things remain in the same place(s) (e.g. toys, supplies, furniture, pictures, etc.)	0	1	2	3
30	Objects to visiting new places	0	1	2	3
31	Becomes upset if interrupted in what he/she is doing	0	1	2	3
32	Insists on walking in a particular pattern (e.g., straight line)	0	1	2	3
33	Insists on sitting at the same place	0	1	2	3
34	Dislikes changes in appearance or behavior of the people around him/her	0	1	2	3
35	Insists on using a particular door	0	1	2	3
36	Likes the same CD, tape, record or piece of music played continually; Likes same movie / video or part of movie / video	0	1	2	3
37	Resists changing activities; Difficulty with transitions	0	1	2	3
38	Insists on same routine, household, school or work schedule everyday	0	1	2	3
39	Insists that specific things take place at specific times	0	1	2	3

Please answer the following questions about the behaviors described above (put a vertical mark (/) on the line to show your answer):

How **often** do they happen?
(If *Never, skip to Section II)*

Never ——— **Constantly**

How **upset** does this person get when interrupted?

Not at all ——— **Extremely**

How much do these behaviors **get in the way of ongoing events?**

Not at all ——— **Severe interference**

0 = behavior does not occur 1 = behavior occurs and is a mild problem 2 = behavior occurs and is a moderate problem 3 = behavior occurs and is a severe problem

VI. Restricted Behavior Subscale

(DEFINITION: Limited range of focus, interest or activity)

40	Fascination, preoccupation with one subject or activity (e.g., trains, computers, weather, dinosaurs)	0	1	2	3
41	Strongly attached to one specific object	0	1	2	3
42	Preoccupation with part(s) of object rather than the whole object (e.g., buttons on clothes, wheels on toy cars)	0	1	2	3
43	Fascination, preoccupation with movement / things that move (e.g., fans, clocks)	0	1	2	3

Please answer the following questions about the behaviors described above (put a vertical mark (/) on the line to show your answer):

How **often** do they happen?
(If *Never, skip to Section II)*

Never ——————————— **Constantly**

How **upset** does this person get when interrupted?

Not at all ——————————— **Extremely**

How much do these behaviors **get in the way** of ongoing events?

Not at all ——————————— **Severe interference**

FINAL QUESTION: Overall, if you "lump together" all of the behaviors described in this questionnaire, how much of a problem are these repetitive behaviors (both for the person with autism, as well as how they affect the people around them)? Please rate on a scale from 1 to 100, where 1 = not a problem at all, and 100 = as bad as you can imagine:

Score from 1-100: _____

Appendix C

Child OC Impact Scale - Revised (COIS - RP)
Parent Report about Child

Name: _____ Age: _____ Date: _____

Please rate how much your child's obsessive compulsive symptoms (unwanted thoughts and/or rituals) have caused problems for him or her in the following areas over the past month. If a specific question does not apply, mark "Not at all".

In the past month, how much trouble has your child had doing the following things because of his or her OCD?	Not at all	Just a Little	Pretty Much	Very Much
1. Taking tests or exams	0	1	2	3
2. Being with a group of strangers	0	1	2	3
3. Leaving the house	0	1	2	3
4. Going shopping or trying on clothes	0	1	2	3
5. Making new friends	0	1	2	3
6. Going to a friend's house during the day	0	1	2	3
7. Writing in class	0	1	2	3
8. Eating in public other than a restaurant, like on a picnic, in the park, or at a friend's house	0	1	2	3
9. Doing fun things during recess or free time	0	1	2	3
10. Getting to school on time in the morning	0	1	2	3
11. Going on a date	0	1	2	3
12. Visiting relatives	0	1	2	3
13. Getting ready for bed at night	0	1	2	3
14. Getting along with his/her parents	0	1	2	3
15. Getting along with his/her brothers or sisters	0	1	2	3
16. Being with a group of people that he/she knows	0	1	2	3
17. Going on a family vacation	0	1	2	3
18. Having relatives visit	0	1	2	3
19. Doing chores that he/she is asked to do, like washing the dishes, taking the garbage out or cleaning his/her room	0	1	2	3

In the past month, how much trouble has your child had doing the following things because of his or her OCD?	Not at all	Just a Little	Pretty Much	Very Much
20. Concentrating on his/her work	0	1	2	3
21. Going to a restaurant or fast food place	0	1	2	3
22. Having a boyfriend/girlfriend	0	1	2	3
23. Going to temple or church	0	1	2	3
24. Going to school outings or field trips	0	1	2	3
25. Keeping friends he/she already has	0	1	2	3
26. Eating lunch with other kids	0	1	2	3
27. Having someone spend the night at his/her house	0	1	2	3
28. Being prepared for class, e.g., having his/her books, paper or pencils ready when needed	0	1	2	3
29. Spending the night at a friend's house	0	1	2	3
30. Bathroom or grooming (brushing his/her teeth or combing his/her hair) in the morning	0	1	2	3
31. Completing assignments in class	0	1	2	3
32. Doing homework	0	1	2	3
33. Getting dressed in the morning	0	1	2	3

Appendix D

NAME:_____

DATE:_____

AGENDA

INTRODUCTION

Introduce self, structure of therapy, and ask for availability for group.

REVIEW TOP FOUR BEHAVIOURS

Remember to operationally define "**severe"** when deciding on the 4 most severe, think about the amount of time spent doing them; distress while performing the behaviors or if the behaviors are not performed, and how much they interfere with doing things with friends and family.

Top Four **Compulsions** Identified By Independent Assessor		
1.		
Less Severe	Same	More Severe
If less severe or more severe, why?		
2.		
Less Severe	Same	More Severe
If less severe or more severe, why?		
3.		
Less Severe	Same	More Severe
If less severe or more severe, why?		
4.		
Less Severe	Same	More Severe
If less severe or more severe, why?		

Current most sever **Compulsions** (if different from above)
1.
2.
3.
4.

NAME:_____

DATE:_____

HAVE PARENTS CHOOSE THE SIX NEXT-MOST SEVERE BEHAVIOURS

Indicate to parents to also choose behaviours that they want to see changed.

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____

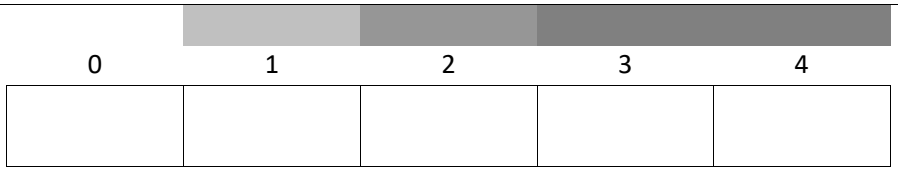
Of the remaining behaviours are they any that you don't want to see changed/treated

1. _____
2. _____
3. _____

DEVELOP ANCHORS FOR THE TOP TEN BEHAVIOURS INDICATED

Remember four is where the behavior is now, and zero where they want it to be. Try to collect it everyday, collecting data is very important, to know when and what the behavior looks like. Need to collect everyday, to see trends some behaviours change, some stay the same. We may not be able to treat all of these behaviours, but parents will learn techniques that they can use.

Behavior #1:



Behavior #2:

NAME:_____

DATE:_____

0	1	2	3	4

Behavior #3:

0	1	2	3	4

Behavior #4:

0	1	2	3	4

Behavior #5:

0	1	2	3	4

Behavior #6:

0	1	2	3	4

NAME:_____

DATE:_____

Behavior #7:

0	1	2	3	4

Behavior #8:

0	1	2	3	4

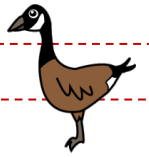
Behavior #9:

0	1	2	3	4

Behavior #10:

0	1	2	3	4

Appendix E



What is Obsessive-Compulsive Behaviour?

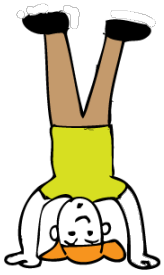
Sometimes your brain may send out wrong messages. This is called OCB. OCB is like Hiccups. It's not your fault at all. It just happens.

Sometimes we try lots of things to make hiccups go away but they just won't! Here are some things we often try:

Drinking water

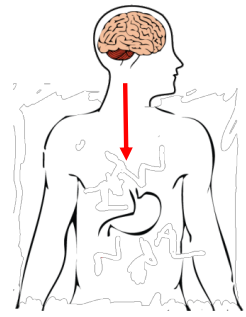
Holding our breath

Standing on our heads

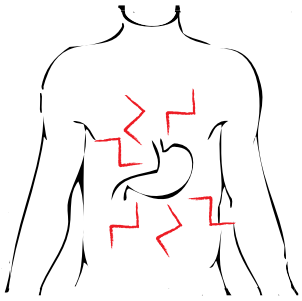


Here's a story to help you understand how OCB works:

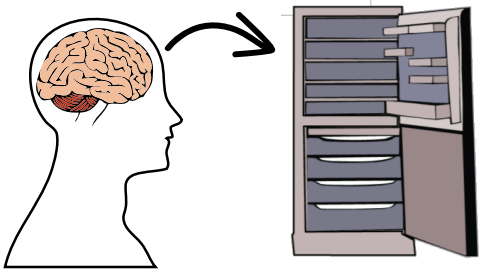
Your brain sends out lots of messages. Your brain may send a message to your stomach that you are hungry



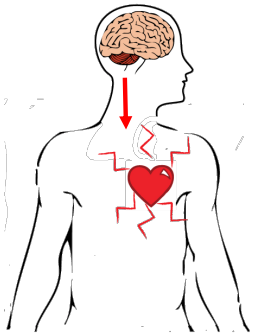
This might make your tummy grumble.



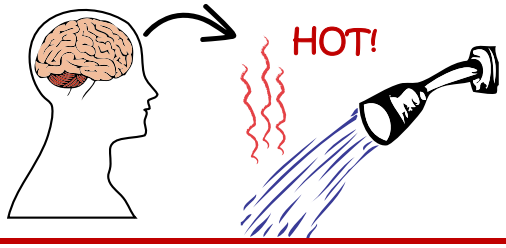
Then your brain may send a message for you to open the fridge so you can find something to eat.



Sometimes, the brain sends out incorrect messages. For example. Your brain might tell you to be scared of germs. This might make your heart beat faster.



Then your brain may send a message for you to take a shower in very hot water.



Having OCB does not mean that your brain is damaged. Lots of very smart people have OCB. OCB just means that sometimes your brain sends out incorrect messages.

In this group, you will learn a bunch of new things that will help you to recognize the incorrect messages that OCB sends.

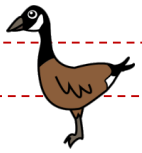
By believing in yourself and learning new strengths, you will learn how to tell OCB to go away. What are some other things that you can tell OCB to do?

Buzz Off! **Beat it!**

Go Away!

Write your own: _____

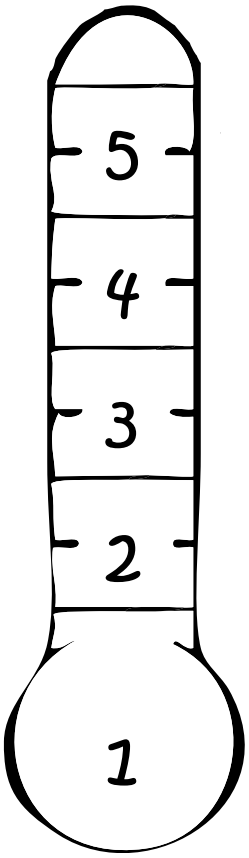
Appendix F



Fear Thermometer

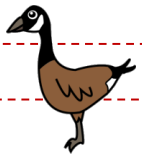
You can make your own thermometer! Colour and write things to help you remember how to use your thermometer. Your support team can help you think of ideas.

My Thermometer



Appendix G

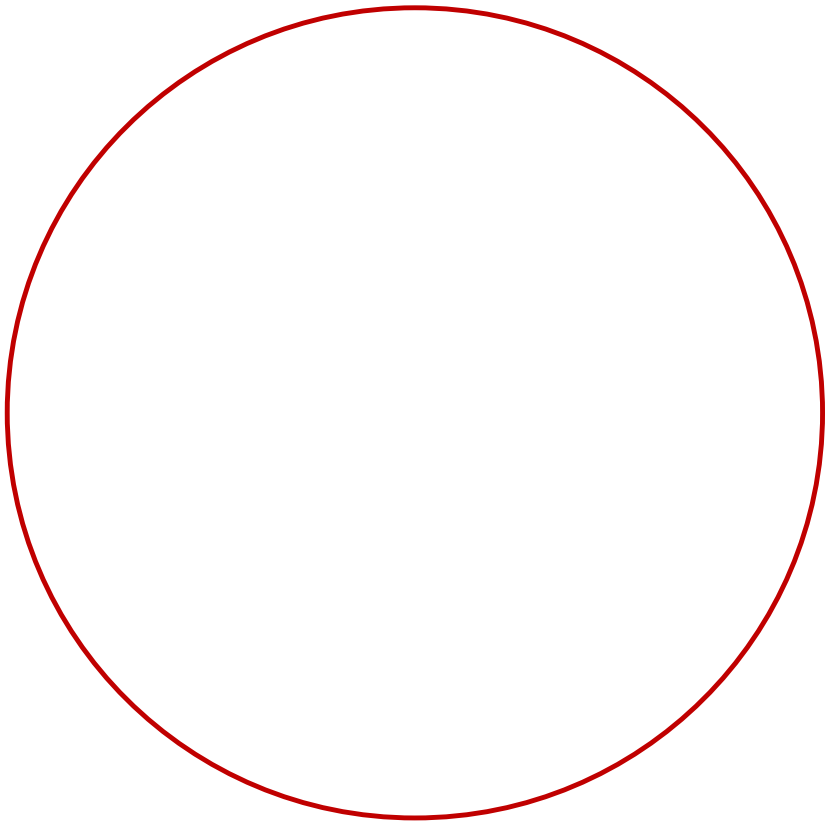
Quality of Life



Write or draw the things that you enjoy or that make you happy inside the circle.

Sometimes OCB can take up a lot of time in your life, and prevent you from doing things that you like to do. Draw, with the assistance of your support team, a circle that shows how much OCB interferes with the things that you enjoy or make you happy.

Beginning



Appendix H

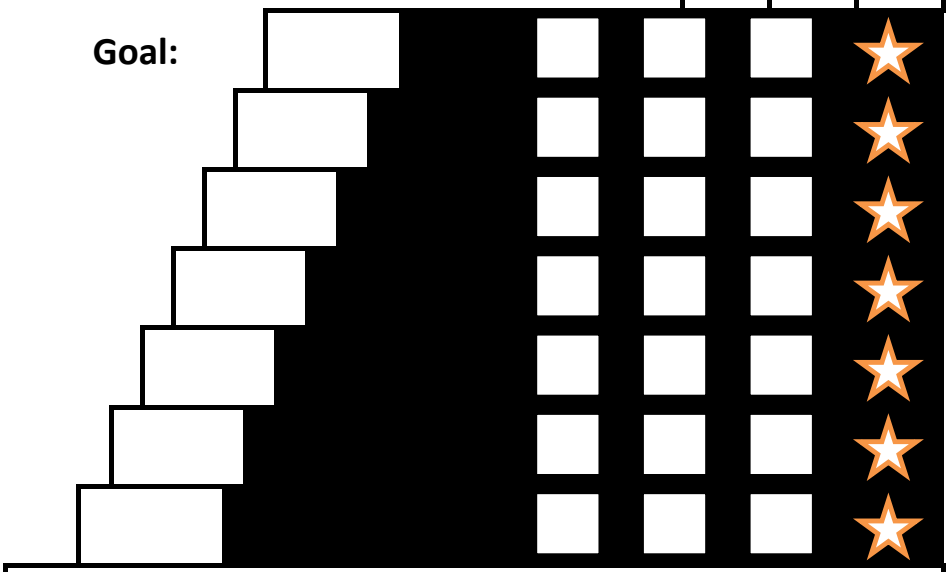
Stairs of Learning
Goal #1:

Things I will do to boss back OCB this week!

Check ✓ if you if used your techniques!

1. _____
2. _____
3. _____

Goal:



Instructions

- Place a ✓ in a box every time you were able to boss back OCB!