

Evaluation of Individual Function-Based Cognitive-Behavioural Therapy for Obsessive Compulsive Behaviour in Children with Autism Spectrum Disorder

Abstract

Children and youth with autism spectrum disorder (ASD) are at increased risk for obsessive compulsive disorder (OCD), but there are few studies evaluating interventions for this comorbidity. This study used a single-case experimental design to test the efficacy of adapted cognitive-behavioural therapy (CBT) combined with function-based behavioural strategies to treat OCD symptoms in two school-age children with ASD. Time series parent report data and standardized OCD measures revealed clinically significant decreases in OCD symptoms in both children as well as increased family quality of life and high consumer satisfaction. This study suggests that children with ASD may respond well to individualized CBT that incorporates functional assessment and interventions, and adaptations for unique learning styles and behavioural characteristics.

Children and youth with autism spectrum disorder (ASD) may show qualitative impairments in social interaction and communication, as well as present with restrictive and/or repetitive behavioural mannerisms (DSM-5, American Psychiatric Association (APA), 2013). Higher functioning individuals (those who are verbally fluent and have an IQ > 69; Thede & Coolidge, 2007) may be at greater risk for anxiety disorders, such as obsessive compulsive disorder (OCD), in comparison to individuals with ASD who are lower functioning, as well as non-ASD clinic samples and non-clinic samples (e.g., Gadow, Devincent, Pomeroy, & Azizian, 2005; Gilliot, Furniss, & Walter, 2001). A review of 31 studies (N = 2,121 individuals <18 years of age) assessed comorbidity of anxiety in ASD and revealed that 17.4% of individuals had OCD symptoms (Van Steensel, Bögels, & Perrin, 2011).

OCD is characterized by intrusive thoughts, images, or ideas (obsessions) and engagement in repetitive behaviours (compulsions) to reduce anxiety (APA, 2013). Researchers acknowledge the challenge in differentiating between OCD and repetitive and/or restrictive behaviours characteristic of ASD. The extent of diagnostic overlap between ASD and OCD, coupled with social-communicative issues and the inability of young children to demonstrate insight into obsessions and/or compulsions (APA, 2013) presents considerable challenges. It remains questionable as to whether ASD and OCD may be considered separate disorders (Wood & Gadow, 2010; Zandt, Prior, & Kyrios, 2007).

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Several controlled trials have evaluated treatments for pediatric OCD in otherwise typically developing individuals under 19 years of age. A meta-analysis (Watson & Rees, 2008) involving 161 participants indicated that cognitive-behavioural therapy (CBT), delivered in an individual or group format comprised of cognitive techniques and exposure plus response prevention was significantly superior to wait-list or placebo controls with a large effect size ($ES = 1.45$, 95% $CI = .68$ to 2.22). CBT also had greater pooled effect sizes than pharmacotherapy for OCD.

Only a few studies have evaluated psychosocial and pharmacological treatments for individuals with ASD (commonly higher functioning) and comorbid OCD symptoms. Adapted CBT has been used in three $N = 1$ case studies where all three children were treatment remitters (Lehmkühl, Storch, Bodfish, & Geffken, 2008; Reaven & Hepburn, 2003; Sze & Wood, 2007), and a number of anxiety disorder randomized controlled trials (RCTs) (Sukhodolsky, Bloch, Panza, & Reichow, 2013). However, only three modular family based studies (Fujii et al., 2012; Storch et al., 2013; Wood et al., 2009) included 1, 2, and 8 participants, respectively, with a primary diagnosis of OCD. Outcomes of specific disorder remittance (including OCD) were not disclosed in the latter two studies, and Fujii et al. showed treatment remittance of OCD symptoms in one participant. A recent open trial (Farrell, Waters, Milliner, & Ollendick, 2012) examined group CBT treatment for OCD symptoms in 43 youth with complex comorbid conditions including ASD ($N = 15$) and reported that approximately 40% of participants with ASD were treatment remitters (score < 14 and a 50% reduction on Child Yale-Brown Obsessive Compulsive Scale). Overall, CBT studies have reported positive preliminary findings. Pharmacological studies have examined serotonin reuptake inhibitors (SRIs) (e.g., McDougle et al., 1992; Sasayama et al., 2009) and other agents such as divalproex (Hollander, Dolgoff-Kaspar, Cartwright, Rawitt, & Novotny, 2001) to treat OCD symptoms in children and youth with ASD, and have shown mixed results. Clearly, more research is needed to determine efficacious treatments for this challenge.

Similar to previous case studies treating OCD symptoms in children with ASD (e.g., Lehmkühl et al., 2008; Reaven & Hepburn,

2003), the present study modified the March and Mulle (1998) CBT manual in accordance with participants' cognitive-developmental levels and individual learning styles (e.g., a lesser focus on cognitive restructuring and increased use of visual strategies). We used a single-case experimental design with time-series parent report data to systematically evaluate the effect of the individual treatment package on targeted behaviours, and preliminary use of functional behavioural assessment and intervention (Cooper, Heron, & Heward, 2007). A large body of research supports the use of function-based assessment to identify potential functions such as positive social attention or escape from task of challenging behaviours which individuals with developmental disabilities may display (Carr et al., 1999). A recent study used functional analysis methodology to successfully assess and treat arranging and ordering, but not OCD per se, in youth with ASD (Rodriguez, Thompson, Schlichenmeyer, & Stocco, 2012).

Materials and Methods

Participants

At time of entry, Jake and Mary (pseudonyms) were 10 years, 8 months and 8 years, 1 month, respectively. Both participants received no medications at entry nor for the duration of the study. Their biological mothers attended all individual treatment sessions. Both children entered the study with a community diagnosis of ASD from a physician or psychologist. Additionally, prior to participant acceptance, the Autism Diagnostic Interview-Revised (ADI-R; Rutter, LeCouteur, & Lord, 2003) was administered by an independent research-reliable MA level psychometrist as a confirmatory test of the community diagnosis, and both children met criteria for ASD. Due to resource limitations and time constraints, we were unable to administer the ADOS (Lord, Rutter, DiLavore, & Risi, 1999). The first author who has a Ph.D. in Clinical Psychology and over 17 years of experience in conducting mental health and cognitive assessment, completed all pre- and post-standardized assessments. Using the Wechsler Intelligence Scale for Children-IV (WISC-IV; Wechsler, 2004), Full Scale IQs were in the Low-Average range for both children. According to the Vineland Adaptive Behavioral Scales II (Vineland-II; Sparrow, Cicchetti & Balla,

2005), Jake and Mary presented as adequate in the communication domain. Regarding Vineland-II socialization and daily living skills domains, Jake presented as adequate and moderately-low, respectively; Mary presented in the low range for both domains. The OCD module of the Anxiety Disorders Interview Schedule (parent) (ADIS-P; Silverman & Albano, 1996) and the Children's Yale-Brown Obsessive Compulsive Scale (CY-BOCS; Goodman, Price, Rasmussen, Riddle, & Rapoport, 1986) indicated that both children met criteria for OCD (their CY-BOCS scores were in the *severe* range). A Quality of Life Questionnaire (Feldman, Condillac, Tough, Hunt, & Griffiths, 2002) indicated that OCD symptoms affected multiple domains of life for the child and his/her family members.

Measures

Autism Diagnostic Interview-Revised (ADI-R)

This standardized, semi-structured clinical interview is administered to caregivers of individuals with possible ASDs. It is consistent with DSM criteria focusing on content areas including: communication, social development and play, repetitive and/or restrictive behaviours, and general behavioural problems. The ADI-R has acceptable psychometric properties (Lord, Rutter, & Couteur, 1994).

Anxiety Disorders Interview Schedule for DSM-IV (Parent) (ADIS-P)

The ADIS-P (Silverman & Albano, 1996) is a semi-structured interview that permits diagnosis of childhood anxiety disorders. It has sound psychometric properties, showing good interrater and test-retest reliability (Silverman, Saavedra, & Pina, 2001). To substantiate OCD, the ADIS-P OCD module and CY-BOCS (Goodman et al., 1986) were administered.

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

The CY-BOCS (Goodman et al., 1986) is a semi-structured interview designed to determine time, distress, interference, resistance and control associated with obsessive and compulsive symptoms for children ages 6 through 17 years. This measure has acceptable psychometric properties

including internal consistency, convergent/divergent validity, inter-rater and test-retest reliability (Storch et al., 2004; Storch, Geffken, & Murphy, 2007). Ten items are included in the scoring algorithm and rated on a 5-point ordinal scale from 0 (*none*) to 4 (*extreme*). Anxiety scores are categorized as *mild* (score of 8–15), *moderate* (score of 16–23), *severe* (score of 24–31), or *extreme* (score of 32–40). The CY-BOCS was administered jointly to parent-child dyads. Responders were able to view the ten questions, and were then asked to rate in whole numbers or between whole numbers (e.g., between 1 and 2 = 1.5).

Quality of Life Questionnaire (QOL)

The QOL Questionnaire (Feldman et al., 2002) was completed by the parent, and consisted of eight questions rated on a 7-point Likert scale (1 = *minimally* to 7 = *extremely*) to determine the extent to which OCD in general affected various areas of the child and family members' lives. The eight areas included: learning, community involvement, forming friendships, degree of interference in daily activities and routines, family members' ability to invite friends to the home and/or attend social functions outside of the home, stress on family members, and whether the child's behaviour resulted in others responding negatively to him/her.

Consumer Satisfaction Questionnaire (CSQ)

The CSQ (Feldman et al., 2002) is a self-report measure that consisted of four questions to evaluate the consumer's perceived level of involvement, satisfaction with the therapy, development of coping strategies, and perceived effectiveness. At post-treatment, parents rated each area on a 7-point Likert scale (1 = *not at all satisfied* to 7 = *very satisfied*).

Target Behaviours

Target behaviours for Jake included: (1) excessively digging his fingernails into bars of soap to clean under his nails; (2) requesting his mother to "check" that his fingers were clean at mealtimes; and (3) requesting his mother to recite a nightly vocal ritual that listed off people, places and things that were "good" or "happy" to help him sleep, as well as several reassuring statements such as "you will not die from dehydration." See Table 1 for operational definitions of the three behaviours.

For Mary, (see Table 1) target behaviours included: (1) avoidance of materials with poison symbols (e.g., items in the garage, hairspray, cleaning products); and (2) bringing her garbage from school home (presumably because she was avoiding using the school garbage can). Note that with the exception of Jake's bedtime ritual (which was prompted by a fear of something bad happening to himself or others if not completed), for all remaining compulsions, the children reported contamination obsessions.

Setting

This study received approval from the University Research Ethics board, and written informed consent was obtained from both parents and children. Treatment sessions took place during the school year in a Research Centre that resembles an out-patient clinic setting, with a waiting room and various family and observation rooms. Sessions were primarily conducted by the second author (MA student in Applied Disability Studies), with weekly supervision provided by the first author and the student's supervisor (Associate Professor with a Ph.D. in Clinical Psychology). Each week, the student created an intervention plan that was reviewed and edited face-to-face with her supervisor. Training also included: reviewing literature, watching videos from previous sessions (of the participants as well as video of other clients), and engaging in role-playing pertinent to the upcoming session. The super-

visor was present for five of Jake's 15 (90 minute) treatment sessions, and three of Mary's 11 (60-90 minute) sessions, as well as booster sessions for both families. The supervisor gradually faded her presence over sessions, and then attended at the student's request (i.e., when more serious issues arose).

Procedure

Data Collection

Regarding parent report data, both mothers rated their child's individual behaviours (e.g., "Overall, how much did Jake ask you to smell his fingers today?") on a scale from 1 (*not at all*) to 10 (*very, very much*). For Jake, we included two additional questions to assess his behaviour using permanent product. For example, Jake's mother examined a bar of soap at night to observe whether indentations of fingernail marks were visible. Also, for his bedtime ritual, she was provided with an audio-recorder to capture duration of vocal rituals and statements (and the researcher recorded each duration).

Research Design

A multiple baseline design across behaviours and participants was used (Cooper, Heron & Heward, 2007) to evaluate the effects of our multimodal treatment on parent report of target behaviours. For each participant, we applied the

Table 1. Operational Definitions for Target Behaviors

<i>Compulsion</i>	<i>Operational Definition</i>
JAKE	
1. Digging fingernails into soap	Any instance of fingernails touching bar of soap (so it is visible to the naked eye)
2. Requesting for his mother to smell his fingers	Any instance where Jake verbally requests or places fingers into his mother's face for her to smell them
3. Bedtime Ritual	Any instance where Jake requests to hear the bedtime ritual (mom listing people, places and things that were "good" and "happy" and reassurance statements)
MARY	
1. Avoidance of poison symbols	Any instance where Mary refuses to touch an object or enter an area because of a poison symbol on a visible product
2. Bringing home garbage from school	Any instance where Mary brings home her garbage items from school

treatment to target behaviours that were hierarchically ordered in severity, as well as related OCD symptoms in the same response class (e.g., contamination-related behaviours). For Jake, permanent product data were evaluated simultaneously with parent report. Three phases were included in the design: (1) baseline; (2) psychoeducation and mapping (PM); and (3) function-based assessment and intervention (FBAI), cognitive training (CT), exposure and response prevention (ERP) plus positive reinforcement. The first component of treatment, PM, was applied collectively to target behaviours, and the second set of components (i.e., FBAI, CT, ERP plus positive reinforcement) was applied individually to target behaviours. This second set of components was considered the active treatment phase since ERP has been repeatedly noted as the active intervention in symptom reduction for OCD (e.g., McLean et al., 2001).

Treatment Package

Treatment was based on the March and Mulle (1998) protocol including: psychoeducation/mapping, cognitive training, (graded) exposure and response prevention (ERP), and relapse prevention with follow-up booster sessions. Adaptations and additions for ASD and cognitive-developmental level included: (1) a protracted cognitive component; (2) increased use of visuals; (3) family-focused treatment (Barrett, Farrell, Pina, Peris, & Piacentini, 2008); (4) function-based behavioural assessment and intervention; and (5) positive reinforcement (e.g., verbal praise, tangibles, and reward systems) for adherence to the therapy exercises and homework in the home setting.

General Psychoeducation/Mapping (PM)

This was completed in two to three sessions. It allowed for a familiarity of all obsessions and compulsions, understanding interference, and communicating that OCD was not the child's "fault" and could be externalized (whereby the child is the "boss" and has the ability to control OCD with a support team assisting him/her). Obsessions and compulsions were written down, triggers of behaviours were identified, and a "fear thermometer" was used to rate the severity of each behaviour (e.g., how distressed the child would become if he/she could not engage in a given compulsion). In comparison

to Jake, Mary appeared to experience difficulty in using the fear thermometer. Both children benefitted from the use of visual aids, and with parental assistance, they were able to verbally discuss their urges to complete compulsions. In addition to PM, the March and Mulle (1998) protocol specifies that parents should verbally praise the child for engaging in behaviours other than vocalizing about obsessions and/or performing compulsions.

Protracted CT and ERP Tailored to Target Behaviours

Beginning with one compulsion that each child could resist performing some of the time, we built on externalizing statements learned in PM (e.g., "I'm the boss of you, OCD!") by restructuring thoughts (e.g., in the case of Jake's finger smelling, explaining to him that his mother could not tell if his hands were clean by smelling his fingers). We used simple concrete statements in an attempt to "disprove OCD" and decrease personal responsibility of causing bad things to happen (in this case, becoming contaminated or causing harm to self/others). Vocal statements were printed on written cards that the children personalized with drawings and stickers. In Mary's case, given the limited observed benefit of cognitive restructuring for the first behaviour, we focused on use of externalizing and positive self-statements for remaining behaviours.

ERP involves exposure to the feared thought/situation, and preventing the child from engaging in the behaviour. For Jake's bedtime ritual, his mother implemented stimulus fading. In session, the therapist made suggestions to the parent regarding gradually cutting out parts of the bedtime ritual involving people, places and things. Regimented statements were eliminated (e.g., "You will not die from dehydration."), and the final step was making the goodnight statement ("good night, love you, see you in the morning") flexible by generating and practicing various statements until he accepted statements like "good night" or "see you tomorrow."

Family-Focused Training

As reviewed in Barrett et al. (2008), "family focused" training describes protocols that involve systematic parent training within ther-

apy. During sessions, parents learned treatment protocols, and acted as “coaches” for their children in session and at home. In addition to collecting daily data on behaviour, they assisted their children in completing homework which involved practicing coping strategies such as externalizing statements (“Buzz off OCD!”) and then using these statements when refraining from performing part or all of the compulsion.

Function-Based Assessment and Intervention

For each behaviour, prior to beginning protracted CT and ERP, the Questions About Behavioral Function (QABF) (Matson & Vollmer, 1995) was administered. It includes five items to examine each of four recognized functions including: attention, sensory/non-social, escape, tangible, as well as five questions to examine physical health/discomfort as a setting event. Each item is rated on a four point scale ranging from 0 (*never*) to 3 (*often*). The QABF shows good preliminary psychometric properties with individuals with developmental disabilities (Matson, Bamburg, Cherry & Paclawskyj, 1999).

Parent report for both children was combined with in-session therapist observation of obsessive-compulsive behaviour and perceived antecedents and consequences. Parent report and therapist observation indicated that several of both Jake’s and Mary’s compulsions involved seeking reassurance, which may have served a social attention function. Function-based intervention included differential reinforcement of alternative behaviour (DRA), planned ignoring and redirection (Cooper et al., 2007). For example, when Jake asked his mother to smell his fingers, this behaviour may have served the function of gaining access to parental attention. As such, parents were instructed to ignore (i.e., remove possible attention reinforcement) and redirect Jake to engage in a coping strategy. The parents delivered this direction in a neutral voice when Jake engaged in the behaviour. If Jake engaged in an alternative coping strategy, his parents praised him (i.e., provided attention for the alternative behaviour). Jake also received praise and preferred tangibles for sitting down at mealtime and participating in an appropriate conversation, as an identified replacement behaviour to reassurance seeking. Given that physical health/discomfort (e.g., becoming sick with a cold) was

endorsed as a setting event for this behaviour by the parent on the QABF, parents were instructed to continue the protocol when Jake was ill.

Self-Monitoring and Reinforcement

Jake was shown how to self-monitor (using a checklist) his success with exposures. In contrast, Mary’s mother assumed the task of monitoring her daughter’s behaviours. Both children received various forms of positive reinforcement for practicing coping strategies (e.g., reviewing positive self-talk) as well as completing exposures at home. Reinforcement included verbal praise as well as tangibles (e.g., stickers, tokens, checkmarks and extra time to play video games).

Relapse Prevention and Booster Sessions

Relapse prevention involved a discussion of the “waxing and waning” nature of OCD symptoms, the importance of applying learned strategies to behaviours that resurface, problem-solving new behaviours and ensuring that exposures are completed in all settings (March & Mulle, 1998). Following treatment, Jake and Mary were seen for four and two booster sessions, respectively, to work on behaviours that had resurfaced and, for Jake, one new behaviour (e.g., avoidance of wiping after defecating). During booster sessions, previous strategies were reviewed, exposures were discussed, and preferred tangibles were selected. Jake also received help for other challenges (e.g., fear of trying new things, social skills) that were not part of OCD. In addition to face-to-face sessions, the primary therapist used periodic email correspondence to communicate with both parents.

Treatment Integrity

A checklist for each treatment component (adapted from March & Mulle, 1998) was created, and fidelity checks were conducted by a trained naive observer who watched videotaped sessions. Treatment integrity (TI) checks were completed for approximately 60% of sessions, whereby the second author selected treatment of two behaviours for Jake and one behaviour for Mary. TI was calculated by dividing the number of agreements (i.e., treatment components implemented) by the number of agreements plus disagreements and multiplying by 100. For both children, TI was 100%.

Results

Evaluation of Time Series Data and Standardized Measures

Jake

See Figure 1 for a multiple baseline design across participants and behaviours. Parent behaviour ratings (primary axis) and for Jake, permanent product data (secondary axis) are plotted. For both children, PM alone did not appear to have a treatment effect. When the second phase (FBAI, CT, ERP plus positive reinforcement) was applied to digging fingernails in soap, the behaviour decreased but remained variable, and then dropped to near zero levels in treatment and follow-up. Baseline data was not collected for smelling fingers as it was not reported as a severe problem until PM. In PM, this behaviour showed a similar pattern to fingernails in the soap; however, a lack of baseline data precludes clear interpretation of the impact of the intervention. During the first month of follow-up when Jake was reportedly ill, the two contamination-related behaviours resurfaced. Behaviours returned to near zero-levels following his recovery, and remained over 4-month follow-up. Regarding the bedtime ritual, when Jake's mother self-initiated ERP, parent report of how much she perceived the ritual occurred (but not duration of bedtime ritual) indicates a decrease. When the remaining components were added to ERP, the behaviour remained low and both parent report and duration showed a decrease to zero levels over 4-month follow-up. Overall, a positive correlation between parent report and observed duration (measured by parent via audio recordings), $r = 0.72$, $n = 24$, $p < .001$, partly substantiates the parent's ratings about the bedtime ritual.

Mary

Within 1 month of treatment, Mary's avoidance of items with poison symbols decreased to near zero levels and remained low during 3-month follow-up. The second behaviour (bringing home garbage from school) decreased to zero levels and remained stable for approximately one month. During follow-up, it resurfaced and Mary's mother reported possible triggers such

as a peer report of a dead fish in the garbage at school. With therapist assistance during booster sessions, her mother reinstated learned treatment components. When a particular reinforcer (i.e., attending a movie with a therapist) was introduced in June, the behaviour immediately decreased to zero levels and remained after withdrawing the reinforcer. During treatment and follow-up, garbage was not brought home on 40 out of 59 days (68% of the time).

Results on ADIS, CY-BOCS and Secondary Outcome Measures

At post-test, for Jake and Mary, the ADIS – parent report (Silverman & Albano, 1996) indicated parent interference scores and clinician severity ratings (CSRs) of 2 and 1, respectively, which is subclinical (Silverman & Ollendick, 2005). Jake's pre to post CY-BOCS score decreased from 25 (*severe*) to 14.5 (*mild*); Mary's score decreased from 29 (*severe*) to 9.5 (*subclinical*) (Storch et al., 2007). Jake and Mary's pre to post Quality Of Life Impact Questionnaire (Feldman et al., 2002) showed a decrease in ratings of the negative effects of OCD symptoms on family and individual quality of life, from 31.5 to 16, and 28 to 9, respectively (maximum negative score = 56). Parents reported high satisfaction with the treatment with an overall rating of 26 and 28 (maximum score = 28).

Discussion

Using a single-case experimental design and pre-post standardized measures, this study showed that a combined treatment package utilizing adapted CBT and FBAI components can reduce contamination-related obsessive-compulsive behaviours and symptom severity in children with ASD. Parent report data indicated that improvements were maintained over a 3 to 4 month follow-up. Parents reported an increased quality of life for their children and families and were highly satisfied with the intervention. Using an experimental design and FBAI components, this study extends positive findings of case studies treating OCD symptoms in children with ASD through adapting the March and Mulle manual (1998) or using a comparable treatment package (Lehmkuhl et al., 2008; Reaven & Hepburn, 2003; Sze & Wood, 2007). Previous literature has emphasized the need

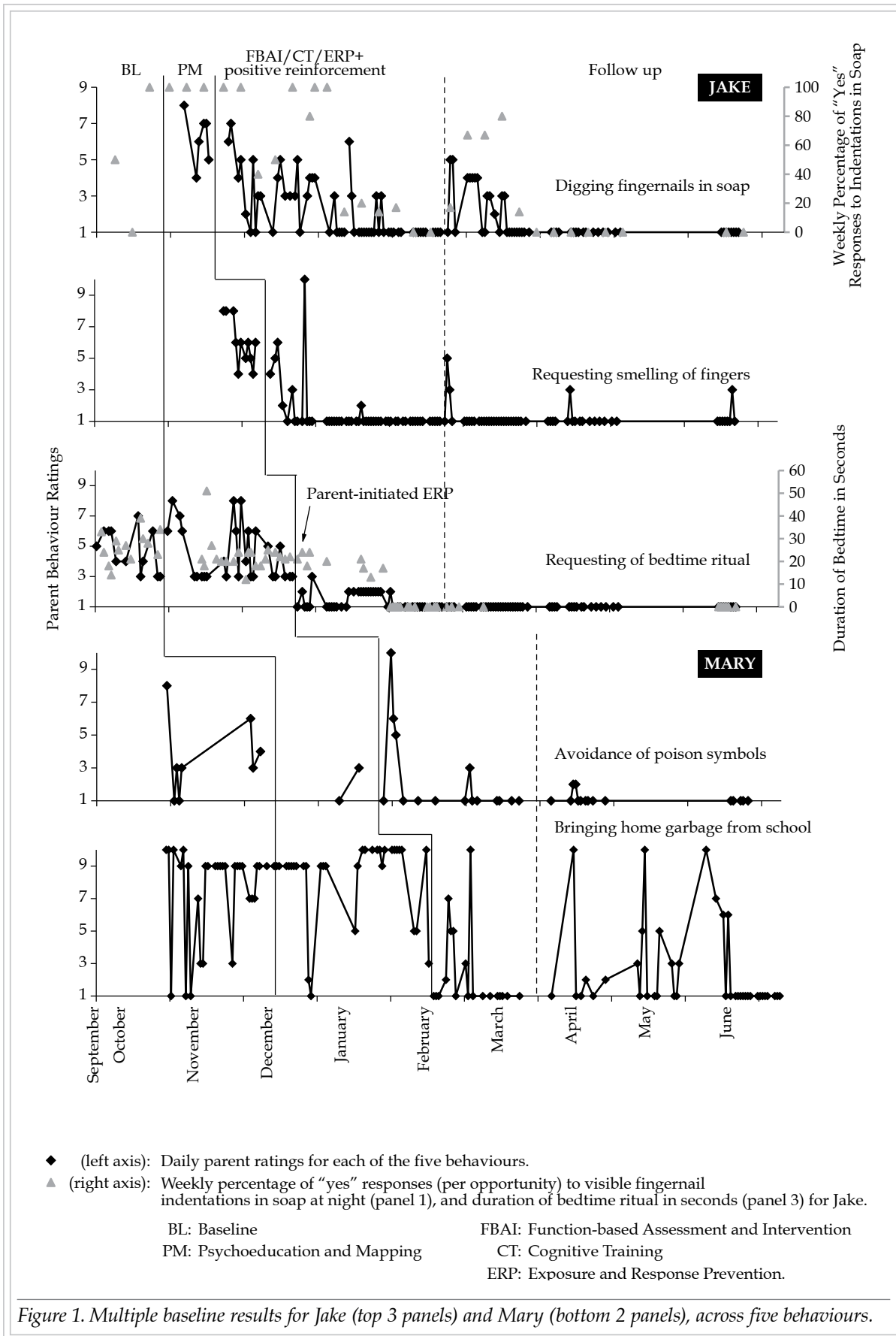


Figure 1. Multiple baseline results for Jake (top 3 panels) and Mary (bottom 2 panels), across five behaviours.

to examine variables such as secondary gain (March & Mulle, 1998), and with use of the FBAL, this study makes a preliminary attempt to do a comprehensive assessment of potential maintaining variables beyond anxiety reduction.

As reported in past case studies, it is important to consider the range of cognitive and developmental levels of participants with ASD. To accommodate the low-average cognitive functioning and unique learning styles of participants in this study, several adaptations were made. First, parents attended all treatment sessions, and were responsible for reviewing coping strategies and carrying out treatment elements within the home. Also, a protracted cognitive component was used where we focused on limited cognitive restructuring, with a strong concentration on coping statements. In line with previous research, additions to the treatment protocol included incorporation of visuals to supplement auditory material, use of self-monitoring, and positive reinforcement contingent on treatment compliance (Lehmkuhl et al., 2008; Reaven & Hepburn, 2003; Sze & Wood, 2007).

This is the first published CBT study to systematically address possible social functions maintaining compulsions such as parental attention in children with ASD. Future studies should conduct analog functional assessments to experimentally verify functions when feasible (Thompson & Iwata, 2007). Component analysis studies are needed to systematically tease apart the relative contributions of different components of our treatment package. For instance, using an experimental design, it did not appear that PM alone showed a treatment effect; changes were evident when multiple components in the second phase (FBAL, CT, ERP plus positive reinforcement) were introduced. However, we cannot conclude which components were active ingredients, and whether these effects could have been achievable without PM first.

There are some recognized limitations to this study. First, results have limited generalizability as the study consisted of only two participants. Second, pre- and post-assessments were not conducted by an independent assessor who was blind to the treatment components. Third, the lack of baseline data for parent ratings of Jake's request to smell fingers is an obvious limitation. A fourth limitation involved variation

in the data for Mary's behaviour of bringing home garbage as data was variable throughout phases (accompanied by data points at zero levels in baseline) and therefore warrants cautious interpretation of a treatment effect. Fifth, it is important to acknowledge that parent report data is susceptible to observer drift. This was likely the case for Jake's bedtime ritual, where during parent-initiated ERP, there was a lack of correspondence between parent report and recorded duration of the ritual when his mother initiated ERP (although the overall data showed a high correlation). Where possible, future researchers should explore options to simultaneously collect parent report and objective (probe) data with inter-observer reliability. It should be noted however that some private OC behaviours may not be conducive to observation (the child would not perform the behaviour if he/she knew someone was watching) which would make this task difficult in some cases.

Conclusion

The present research, using a single-case experimental design, provides evidence towards validating an adapted function-based CBT treatment for OCD symptoms in children with ASD. Replication is needed with single-case experimental designs, component analyses and randomized controlled trials. Additional research should also focus on validating treatments for individuals who present with varying autism phenotypes and other anxiety disorders.

Key Messages From This Article

People with disabilities: If you experience obsessive-compulsive behaviour, you deserve to be able to access therapy that is a good fit for you as a person.

Professionals: Assisting children with disabilities in coping with obsessive-compulsive behaviour involves use of evidence-based practice and tailoring treatment to fit their unique learning styles.

Policymakers: Increased policies are needed that specify use of evidence-based practice and individualizing treatment to meet the unique needs of children with ASD and other disabilities.

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