

PARENTAL OUTCOMES FOLLOWING PARTICIPATION IN A COGNITIVE
BEHAVIOURAL THERAPY PROGRAM FOR CHILDREN
WITH AUTISM SPECTRUM DISORDER

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Abstract

Parents of children with Autism Spectrum Disorder (ASD) can experience significant stress, anxiety and depression, which can affect parenting and the parent-child relationship. There is evidence that parent involvement in child-focused therapy may indirectly improve parent mental health, though parent outcomes are rarely measured in this context. The current study examined changes in parent mental health, parenting, and expressed emotion, following participation in a randomized controlled trial of cognitive behavioural therapy for children with ASD. Participants included 44 children (8-12 years of age, at least average IQ) and their caregivers. Post-intervention, small treatment effects occurred in the treatment group in parent self-report of mindful parenting, depression, and use of adaptive emotion regulation strategies, compared to waitlisted parents. Small to moderate treatment effects also occurred across all parents in perceptions of their children, mindful parenting, and use of adaptive emotion regulation strategies. These results have implications for intervention development and evaluation.

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Parental Outcomes Following Participation in a Cognitive Behavioural Therapy Program for Children with Autism Spectrum Disorder

Autism Spectrum Disorder (ASD) is a neurodevelopmental disorder characterized by deficits in social communication and social interaction, as well as restricted or repetitive patterns of behaviour, interests or activities (American Psychiatric Association, 2013). For children with ASD, in addition to these core features, rates of emotional and behavioural problems are high, with many experiencing a range of internalizing and externalizing psychiatric symptoms (Totsika, Hastings, Emerson, Lancaster, & Berridge, 2011). Prevalence rates for psychiatric comorbidities vary, but it is estimated that approximately 70% percent of children with ASD will meet criteria for at least one co-occurring psychiatric disorder (Leyfer et al., 2006; Simonoff et al., 2008; Totsika et al., 2011).

Cognitive behavioural therapy (CBT) has been shown to be an effective treatment for anxiety in children with ASD who do not have an intellectual disability (Sofronoff, Attwood, & Hinton, 2005; Ung, Selles, Small, & Storch, 2014). As dysregulation of emotion typically characterizes mood and anxiety disorders (Gross & Thompson, 2007), many authors suggest that treatment for children with ASD should be expanded to a broader range of emotion difficulties by addressing emotion regulation deficits (Sofronoff, Beaumont & Weiss, 2014; Weiss, 2014). However, although CBT has been shown to be a promising treatment for many children with ASD, there is significant variability in terms of treatment success (Vasa et al., 2014), and little research to identify the variables that are predictive of treatment outcomes.

Parent Involvement

The family context may be an important variable influencing the success of children with ASD in CBT interventions. For typically developing children receiving interventions for anxiety, a number of studies have determined parent-child interventions to be more efficacious than child-only interventions, when parents are not directly involved (Barrett, Dadds, & Rapee, 1996; Bodden et al., 2008; Kendall, Hudson, Gosch, Flannery-Schroeder, & Suveg, 2008; Mendlowitz, Manassis, Bradley, Scapillato, Mieziotis, & Shaw, 1999; Siqueland, Rynn, & Diamond, 2005; Spence, Donovan & Bechman-Toussaint, 2000; for a detailed review see Brendel & Maynard, 2014). For instance, Mendlowitz and colleagues (1999) provided a group intervention for child depression, anxiety and coping with three treatment conditions: child-only group, parent-child group, and parent-only group. Children in the parent-child group were observed to utilize more active coping strategies following the intervention, compared with children in the child-only group. Further, involved parents in the parent-child condition rated their children as significantly more improved in terms of their emotional wellbeing than parents of children in the child-only group (Mendlowitz et al., 1999). The authors suggested that parents in the parent-child condition were better able to act as “co-therapists” for their children outside of the therapy context and monitor their child’s use of coping strategies compared to parents of children in the child-only condition (Mendlowitz et al., 1999).

More recently, the influence of parent involvement has been studied in therapy for children with ASD. In this population, parents may be even more important for their child’s therapy than parents of typically developing children, as children with ASD are likely to be more reliant on their parents (Reaven, 2011). Further, parents may play a key role in helping children generalize new skills acquired in the therapy context to other settings, which is a key challenge

experienced by children with ASD (Reaven, 2011). Puleo and Kendall (2011) examined CBT outcomes in children with anxiety, with and without ASD symptomatology, though none diagnosed with ASD. They demonstrated that children with moderate ASD symptoms experienced significantly greater gains in a family CBT program than in individual CBT. Specifically, though children with moderate ASD symptomatology were less likely to improve than children with no ASD symptoms in the individual CBT condition, there was no difference found between these two groups of children in the family CBT condition. Therapists reported that children in the family intervention were more involved in therapy and completed more exposure tasks, possibly accounting for this observed difference. Sofronoff, Attwood and Hinton (2005) found that for children with high functioning ASD participating in CBT, child anxiety levels decreased more when children participated in an intervention that included their parents, compared to those in a child-only intervention. Notably, parents in the parent-involved condition indicated that their involvement helped them feel more competent in assisting their children, and empowered from speaking to other parents.

Parent Outcomes

Parent involvement may result in improvements in parents' own functioning following participation in their children's treatment (Conner, Maddox, & White, 2013; Karst, et al., 2015; Reaven et al., 2015; Silverman, Kurtines, Jaccard, & Pina 2009; Sofronoff et al., 2005). There are three broad parent outcomes that may be particularly important to evaluate following CBT for children: parent mental health, parenting approaches, and parent perspectives toward their children. Past research has demonstrated that these areas of functioning tend to be particularly challenging for parents of children with ASD. Further, some preliminary research points to the potential for these parent variables to change over the course of child interventions. Finally,

research on children with ASD has implicated these variables specifically as having significant effects on child functioning outside of the therapy context, as well as being potential determinants of CBT efficacy.

Parent Mental Health

Mental health problems, including symptoms of depression, anxiety and stress, as well as poor coping skills, have been noted for many parents of children with ASD. Compared to parents of typically developing children, parents of children with ASD experience higher stress levels and more severe symptoms of anxiety and depression (Bitsika & Sharpley, 2004; Davis & Carter, 2008; Estes et al., 2009). In fact, the level of chronic stress in parents of children with ASD has been shown to surpass that experienced by parents of children with other developmental disabilities (Cachia, Anderson & Moore, 2015). Many authors suggest the association between parent mental health problems and stress and child psychopathology is bidirectional. One element of the cycle is that, in children with developmental disabilities, high levels of parental stress have been shown to impact child social development (Neece & Baker, 2008), increase behaviour problems (Baker, McIntyre, Blacher, Crnic, Edelbrock & Low, 2003), and lead to poor psychosocial health (Webster, Majnemer, Platt & Shevell, 2008). Over time, as high parental stress contributes to child problems, increased child problems subsequently can exacerbate parent stress (Neece, Green & Baker, 2012).

Although parent outcomes are not often measured in the context of therapy for their children, there is some evidence suggesting that parent mental health may be indirectly affected over the course of therapy for children with ASD. Reaven and colleagues (2015) implemented a group intervention for children ages 7-18 years with ASD for anxiety (Facing Your Fears), and found that although the intervention did not target parent anxiety directly, parents of children

who responded to treatment reported decreases in their own anxiety, which was assessed by a parent-report measure (the State-Trait Anxiety Inventory; STAI). Similar results were found by Conner and colleagues (2013), who implemented a CBT intervention for adolescents with anxiety disorders and found that parents of children who were considered treatment responders reported significant decreases in their own anxiety on the STAI. Other studies have demonstrated that parent reported decreases in stress are associated with their reports of youth changes in anxiety in CBT for youth with ASD (Weiss, Vecili, & Bohr, 2014). Improvements in parent mental health through parent interventions, such as mindfulness-based stress reduction, have also been shown to affect reports of child characteristics, including improvements in children's self-control (as reported by mothers, secondary informants, and teachers), empathy and engagement (as reported by mothers and teachers), and communication, responsibility and cooperation (as reported by teachers; Lewallen & Neece, 2015). Lewallen and Neece propose that the mechanism behind this relationship is that addressing parent mental health increases parent-child closeness and promotes consistent parenting in discipline situations.

Parenting Approaches

The parenting strategies of parents of children with ASD may be an important focus when examining parent outcomes following participation in their child's CBT. Parental responses to children's emotional expression influence children's abilities to regulate and cope with their emotions (Sanders et al., 2015), and the way in which parents respond to child emotions is a key component of parenting. Two different parenting constructs are particularly relevant for parents of children with ASD: negative parenting practices, and the ability to parent mindfully.

Negative parenting practices. Parents of children with developmental disabilities who

experience high stress levels also commonly use negative and controlling authoritarian parenting styles (Woolfson & Grant, 2006). It has been suggested that when parents rely on directive-critical parenting strategies (focusing on obedience, making critical comments, and using directive commands) and exhibit low levels of warm-sensitive parenting, their children tend to be more dependent on them, which negatively affects the development of child emotional self-regulation ability (Eisenberg et al., 2010; Mathis & Bierman, 2015) and independent problem-solving skills (Calkins & Johnson, 1998). Of note, harsh parenting practices may negatively affect children with developmental disabilities appreciably more than typically developing children (Lewallen & Neece, 2015). For children with ASD specifically, inherent social and communication challenges can lead parents to engage in a more protective parenting style (Reaven, Blakeley-Smith, Nichols, Dasari, Flanigan, & Hepburn, 2009). For instance, parents may display “excessive protection”, in which they limit a child’s exposure to anxiety-provoking situations by enabling avoidant behaviour, even when a child may have skills to manage the situation. This further perpetuates child anxiety by limiting opportunities to create and practice coping strategies (Reaven et al., 2009).

There is some evidence to suggest that parenting behaviours may change following interventions for typically developing children, although this research has yet to be conducted with families of children with ASD. In particular, Silverman and colleagues (2009) implemented a CBT intervention with parent involvement for typically developing children with anxiety disorders ages 7 to 16 years, and found that children’s appraisals of their parent’s positive and negative behaviours showed significant improvement post-treatment. This result was found in both an intervention condition where parents were actively involved in their children’s treatment and one where parents were only minimally involved. In contrast, in families of children with

developmental disabilities, interventions for parents have been shown to affect child characteristics. In particular, following a mindfulness based stress reduction intervention for parents, multiple-informants reported improvements in child self-control, which were found to be partially accounted for by changes in parent discipline practices (Lewallen & Neece, 2015).

Mindful parenting. Mindfulness can be defined as the awareness that results from intentionally and non-judgementally paying attention to one's experiences in the present moment (Kabat-Zinn, 2003). The construct of mindful parenting involves applying this internal process of mindfulness to the interpersonal interactions that occur during parenting (Duncan, 2007). Parenting mindfully requires intentionally and non-judgmentally paying attention to one's child, and using a gentle and compassionate approach to reflect on oneself and one's parenting ability (Bögels, Lehtonen, & Restifo, 2010). The use of a mindful parenting approach has been associated with improved parent-child interactions in a number of different mental health and community settings (Bögels, et al., 2010). Using mindfulness personally may allow parents to feel more relaxed, allowing for greater awareness during parent-child interactions (Singh et al., 2014). Mindful parenting may also serve to reduce stress in parents of children with ASD, improving their ability to parent effectively (Cachia, Anderson & Moore, 2015). When mindful parenting skills are taught to parents of children with ASD, it has been shown that children's externalizing behaviours decrease (Singh et al., 2006; Bögels et al., 2008; Neece, 2014), and improvements are seen in child attention problems and self-control (Bögels et al., 2008). In terms of parent outcomes, participation in family-based mindfulness interventions has been shown to decrease parental stress, decrease dysfunctional parenting and increase quality of life (de Bruin, Blom, Smit, van Steensel, & Bögels, 2014). In a single-subject design study with three mothers of children with ASD, participation in a parent intervention for mindful parenting resulted in

greater personal satisfaction with their interactions with their children and with their parenting skills (Singh et al., 2006).

Parent Perspectives Toward Child

Expressed emotion (EE) refers to the amount of emotion displayed by one family member towards another and is a way of observing parent perspectives toward their children (Greenberg, Seltzer, Hong, & Orsmond, 2006). EE is often measured using a five-minute speech sample (FMSS), in which a parent's speech about his or her child is coded for criticism, emotional over-involvement, warmth and positive comments (Magana et al., 1986). High EE, including either high levels of criticism or high emotional over-involvement, has been shown to be more prevalent in mothers of children with intellectual disabilities compared to typically developing children (Laghezza, Mazzeschi, Di Riso, Chessa, & Buratta, 2010). EE has been measured in families of children with ASD using a revised version of the original FMSS coding scheme, the autism-specific five-minute speech sample (AFMSS), in order to more appropriately evaluate EE in families of children with ASD (Benson et al., 2011).

High EE in parents has been shown to predict worsening of medical and psychiatric disorders over time in typically developing individuals (Greenberg et al., 2006). In mothers of adolescents and adults with ASD, higher EE is associated with higher levels of child maladaptive behaviour as well as a greater severity of autism symptoms over time (Greenberg et al., 2006). As well, high EE has been shown to predict higher levels of externalizing behaviours in children with autism (Bader & Barry, 2014) and is correlated with externalizing behaviours in children with other developmental disabilities (Hastings, Daley, Burns, & Beck, 2006). Low EE has also been associated with positive parenting, parent social support, family cohesion, and child social competence (Benson et al., 2011)

Although EE has been found to be a moderator of treatment efficacy in typically developing children (Garcia-Lopez, del Mar Díaz-Castela, Muela-Martinez, & Espinosa-Fernandez, 2014), this has never been examined in therapy for children with ASD. In addition, as EE is purported to be bidirectionally related to maladaptive behaviours and symptom levels in children with ASD (Greenberg et al., 2006), reductions in EE may be related to child gains in treatment.

Current Study

The impact of parent involvement in child interventions has been shown to be important for typically developing children and children with ASD. Research suggests that some parent variables are particularly salient for parent-child interactions in families of children with ASD and thus may contribute more to therapy efficacy. However, there is a need to move beyond simply identifying variables of interest, toward using randomized controlled trials to determine whether they can be altered over the course of therapy, while controlling for time effects. In addition, although there is some evidence to support the premise that parents experience positive changes over the course of their child's therapy, few studies have investigated parent outcomes following participation in their children's CBT in any population, and the literature about this in the ASD population is particularly sparse. Filling this gap in the research is important in order to better understand variability in treatment outcomes for children with ASD and to create programs that best utilize parent involvement to improve children's functioning. As well, the potential benefits for parents participating in their children's therapy on their own wellbeing is worth further investigation.

The current study examines parent change following participation in a parent-involved CBT program focused on improving emotion regulation in children with ASD. The Secret Agent

Society: Operation Regulation (SAS:OR) is a ten-session, manualized, individual CBT intervention for children with high-functioning ASD. Sessions involve education, vivo practice, planning for home and school, and positive reinforcement. Although the therapy is individual and child-focused, a parent attends each session and sits alongside the child the entire time, following along in his or her own parent workbook. The parent also provides support to the child and therapist in-session, and helps the child transfer skills learned to home and school environments. In the context of the SAS:OR intervention, I will address three key research questions and test specific hypotheses for each:

- 1) Is the SAS:OR intervention efficacious in improving parent outcomes?
 - a. Hypothesis: Parents randomized to the SAS:OR intervention will show significantly greater changes in scores on measures of mental health, parenting, and EE, compared to parents assigned to the wait-list control condition, when controlling for baseline scores.
- 2) Do parents demonstrate improved parent outcomes following child participation in the CBT intervention?
 - a. Hypothesis: Parents will show significant improvements in scores on two self-report measures of mental health from pre- to post-intervention.
 - b. Hypothesis: Parents will show significant improvements in scores on two self-report measures assessing parenting approaches from pre- to post-intervention.
 - c. Hypothesis: Parents will show significant improvements in scores on a behavioural measure that assesses parent EE from pre- to post-intervention.
- 3) Are parent changes related to child changes in therapy?
 - a. Hypothesis: Parent changes from pre- to post-intervention on measures of mental

health, parenting, and EE will be significantly correlated with a measure of parent-reported child improvements in psychopathology pre-post treatment.

- b. Hypothesis: Parent changes from pre- to post-intervention on measures of mental health, parenting, and EE will be significantly correlated with clinician scores for child improvements in psychopathology pre-post treatment.

Method

Participants

Participants included 44 children with ASD (93.2% male), eight to 12 years of age ($M = 9.68$, $SD = 1.33$). Children had at least average IQ, which ranged from 79 to 140 ($M = 102.64$, $SD = 14.60$). Each child had one parent (77.3% mothers) attend his or her therapy sessions, and that participating parent also completed the research measures. The demographic and clinical characteristics of parent-child dyads can be found in Table 1.

Table 1

Participant Demographics by Group

	Overall sample <i>N</i> = 44 <i>M</i> (<i>SD</i>) or <i>N</i> (%)	Treatment Immediate <i>n</i> = 23 <i>M</i> (<i>SD</i>) or <i>N</i> (%)	Waitlist Control <i>n</i> = 21 <i>M</i> (<i>SD</i>) or <i>N</i> (%)	
Child age	9.68 (1.33)	9.74 (1.39)	9.62 (1.28)	$t(42) = .30, p = .77$
Child sex				$\chi^2(1) = .46, p = .60$
<i>Female</i>	3 (6.8%)	1	2	
<i>Male</i>	41 (93.2%)	22	19	
Parent age	44.11 (3.98)	43.56 (4.30)	44.75 (3.58)	$t(41) = -.97, p = .34$
Parent sex				$\chi^2(1) = .03, p = 1.00$
<i>Female</i>	34 (77.3%)	18 (78.3%)	16 (76.2%)	
<i>Male</i>	10 (22.7%)	5 (21.7%)	5 (23.8%)	
Child ethnicity ^a				$\chi^2(3) = 4.67, p = .20$
<i>Chinese</i>	3 (6.8%)	3 (13.0%)	0 (0%)	
<i>South Asian</i>	1 (2.3%)	0 (0%)	1 (4.8%)	
<i>White</i>	24 (54.5%)	12 (52.2%)	12 (57.1%)	
<i>Other</i>	7 (15.9%)	5 (21.7%)	2 (9.5%)	
<i>Missing</i>	9 (20.5%)	3 (13.0%)	6 (28.6%)	
Child FSIQ-2	102.64 (14.60)	105.04 (14.85)	99.74 (14.12)	$t(40) = 1.18, p = .25$
Child SCQ Total Score	21.18 (3.87)	21.74 (3.84)	20.57 (3.89)	$t(42) = 1.00, p = .32$
Child SRS-2 Total T-score	74.05 (8.79)	72.52 (8.63)	75.71 (8.87)	$t(42) = -1.21, p = .23$
Count of ADIS Diagnoses	2.82 (1.73)	2.48 (1.59)	3.19 (1.83)	$t(42) = -1.38, p = .18$
ADIS Clinical Severity	3.93 (1.69)	3.87 (1.87)	4.00 (1.52)	$t(42) = -.25, p = .80$
CGI Severity Rating	4.02 (1.61)	3.83 (1.61)	4.24 (1.61)	$t(42) = -.85, p = .40$

^a additional categories of ethnicity were listed and were not endorsed

Inclusion criteria. In order to be included in the study, children had to be between the ages of eight to 12 and have IQ scores at least in the average range (>79). IQ was verified using the vocabulary and matrix reasoning subtests of the Wechsler Abbreviated Scale of Intelligence-2nd Edition (WASI-II; Wechsler, 2011) to obtain the FSIQ-2 score. Parents were required to provide documentation of their child's diagnosis of ASD from a qualified health care practitioner based on DSM criteria; and diagnosis was confirmed using two commonly used tools, the Social Communication Questionnaire (SCQ; Rutter, Bailey, & Lord, 2003) and the Social Responsiveness Scale (SRS; Constantino & Gruber, 2012). If the child fell below the cut-offs,

the Autism Diagnostic Observation Schedule (ADOS; Lord et al., 2000) was used to confirm ASD status. Lastly, families had to be available to participate in all 10 sessions as well as pre- and post-intervention research appointments.

Measures

Parent Expressed Emotion. Expressed emotion was measured using the autism-specific five-minute speech sample (AFMSS; Benson, Daley, Karlof, & Robison, 2011), in which a parent is asked to speak for five minutes about their child. Interviews were audio-recorded and transcribed. EE was coded by the first author and a research assistant, both trained using the AFMSS coding manual (Daley & Benson, 2008).

Responses on the AFMSS are evaluated using four global scales: parent's initial statement about the child (rated as positive, negative or neutral), quality of the relationship (rated as positive, negative or neutral), emotional over-involvement (parent behaviour described as over-protective, self-sacrificing or lacking objectivity; rated as low, moderate or high) and warmth (tone of voice, spontaneity, concern and empathy; rated as low, moderate or high). As well, two frequency counts are obtained: number of critical comments (negative assertions about the child) and number of positive comments (statements of praise, approval or appreciation). These categories and counts are used to derive a score for overall EE, which is rated as low, moderate or high.

A high overall EE score is obtained if at least one of the four global scales has a negative score, and parents provide more critical than positive comments; a low score is obtained if no negative scores are obtained and there are more positive than critical comments. Moderate or 'borderline' EE is coded if there is at least one negative global rating on the initial statement, warmth, emotional over-involvement or quality of relationship scales, *or* if there are more

critical than positive comments.

The AFMSS has demonstrated good to excellent inter-rater reliability ($ICC = 0.77-0.95$) and code-recode reliability ($\rho = 0.81-1.00$; Benson et al., 2011). In the current study, inter-rater agreement on the AFMSS for overall EE was acceptable across 25% of samples ($\kappa = 0.64, p = .004$). A ratio of parents' positive comments about their children relative to their total number of emotionally salient comments (positive and critical comments combined) was also created. Intra-class correlations between raters for ratio of positive comments to total comments was good (Cronbach's $\alpha = 0.89$).

With the exception of the EOI subscale, which has been found to be unrelated to other AFMSS components and overall EE, inter-correlations between AFMSS subscales and Overall EE have been shown to be statistically significant and to range from low to moderate, suggesting that while each subscale taps into the same underlying construct (EE), they each provide separate information ($\rho = -.28-.48$; Benson et al., 2011). Inter-correlations between AFMSS subscales and total EE in the current study were as follows: Spearman's $\rho = -.30$ (warmth), $.19$ (relationship), $.34$ (initial statement), $-.60$ (positive comments), and $.26$ (critical comments). Inter-correlations between EOI and overall EE were unable to be calculated due to low variability in EOI in the current sample.

As suggested by Benson et al., (2011), overall EE was dichotomized into Low versus Borderline/High. For the current sample, 75% of parents fell in the Low range for overall EE, and 25% were Borderline/High. There was very low variability in four of the five subscales that would contribute to a score of Borderline/High overall EE: Only 4.5% of the sample (2 participants) had negative initial statements, 4.5% had relationships rated as negative, 4.5% had low warmth, and no participants had moderate or high EOI. Therefore, these subscales were not

included in the analysis.

The AFMSS subscale with the most variability was the frequency of positive and negative comments. In the current sample, 15.9% of parents had more negative than positive comments, which would contribute to a score of Borderline/High overall EE. The rest of the sample had either an equal number of positive and negative comments, or more positive than negative comments. Accordingly, the AFMSS variables included in the final analysis were overall EE and ratio of positive comments to total comments.

Parenting approaches. Negative parenting practices were measured using the Parenting Scale (PS; Arnold, O’Leary, Wolff, & Acker, 1993). This 30-item parent-report questionnaire measures the probability of a parent using particular strategies in a number of discipline situations. All item responses are provided on a seven-point scale in which the respondent indicates a response somewhere between two opposite end points (e.g., *"When my child misbehaves..."* 1 = I do something right away to 7 = I do something about it later). The measure has three scale factors: Hostility (use of physical/verbal force), Laxness (permissive or inconsistent discipline), Over-reactivity (emotional or harsh discipline), as well as miscellaneous items that are added to the total score. The PS has good internal consistency for its subscales ($\alpha = 0.78-0.85$; Arnold et al., 1993; Rhoades & O’Leary, 2007) and for the total score ($\alpha = 0.84$; Arnold et al. 1993). Internal consistency estimates for the PS subscales in the current study ranged from Cronbach’s $\alpha = 0.66 - 0.75$, and 0.78 for total. For the current sample, out of a possible 1 to 7, mean scores for Hostility ranged from 1 to 4.67 ($M = 1.59, SD = .83$), for Laxness 1.20 to 4.60 ($M = 2.54, SD = .87$), for Over-reactivity 1.00 to 5.20 ($M = 3.30, SD = 1.12$), and for total PS 1.93 to 4.48 ($M = 3.02, SD = .55$).

Parents' approach to mindful parenting was measured with the Interpersonal Mindfulness in Parenting Scale (IEM-P; Duncan, 2007). The IEM-P is a 10-item parent-report measure that assesses parenting cognitions, attitudes and behaviours in four domains: (1) present-centered attention and emotional awareness during parenting interactions (e.g., *"I find myself listening to my child with one ear because I am busy doing or thinking about some- thing else at the same time"* and *"I notice how changes in my child's mood affect my mood"*); (2) openness and non-judgmental receptivity to their children's thoughts and emotions (e.g., *"I listen carefully to my child's ideas, even when I disagree with them"*); and (3) ability to regulate their own reactivity to their child's behaviour (e.g., *"I often react too quickly to what my child says or does"*). Parents provide responses on a five-point scale, from 1 (*never true*) to 5 (*always true*). In parents of typically developing youth, the IEM-P scale has demonstrated adequate internal consistency ($\alpha = 0.62$; Coatsworth, Duncan, & Greenberg, 2010). In parents of individuals with ASD, the IEM-P has demonstrated excellent internal consistency for the overall scale ($\alpha = 0.92$) and acceptable to good scores for subscales ($\alpha = 0.64-0.82$; Beer et al., 2013). In the current study, internal consistency estimates for some of the IEM-P subscales were very low (Cronbach's $\alpha = .16$ for non-judgment; and $.27$ for awareness/attention). The overall mean scale score internal consistency was acceptable (Cronbach's $\alpha = 0.58$), and consequently, was the only variable included in the analysis, providing an estimate for total mindful parenting. For the current sample, out of a possible 10 to 50, total IEM-P at baseline ranged from 28 to 45 ($M = 36.8$, $SD = 3.5$).

Parent mental health. Parent psychopathology and stress were measured using the Depression Anxiety & Stress Scale (DASS-21, Lovibond, 1995). This 21-item self-report measure has seven items per subscale that are rated on a four-point scale (0 = Never to 3 =

Almost Always) resulting in scores for Depression (D), Anxiety (A) and Stress (S) that can fall into the ranges of normal (D=0-9, A=0-7, S=0-14), mild (D=10-13, A=8-9, S=15-18), moderate (D=14-20, A=10-14, S=19-25), severe (D=21-27, A=15-19, S=26-33) or extremely severe (D=24+, A=20+, S=34+). For the current sample, 75% of parents fell into the normal range for depression, 15.9% into the mild range, and 9% moderate and higher. For anxiety, 79.5% fell into the normal range, 13.6% mild, and 6.8% moderate or higher. For stress, 70.5% of parents obtained normal scores, 20.5% mild scores, and 9.1% moderate or higher. The DASS-21 has demonstrated good to excellent internal consistency with a typically developing sample of adults in the United Kingdom ($\alpha = 0.88$ for depression, $\alpha = 0.82$ for anxiety, $\alpha = 0.90$ for stress and $\alpha = 0.93$ for total score). Internal consistency estimates for the DASS-21 subscales in the current study ranged from Cronbach's $\alpha = 0.74 - 0.90$, and 0.91 for the total score.

Parents' abilities to cope with emotions were also assessed using Cognitive Emotion Regulation Questionnaire-Short Version (CERQ-Short; Garnefski & Kraaij, 2006), which assesses individuals' cognitive emotion regulation strategies during stressful life events. It is an 18-item self-report questionnaire with subscales encompassing nine emotion regulation strategies: Acceptance, Blaming Others; Catastrophizing, Focus on Thoughts/Rumination, Positive Reappraisal, Positive Refocusing; Putting into Perspective, Refocus on Planning and Self-Blame. Each item is rated on a five-point scale, from 1 (*almost never*) to 5 (*almost always*), with total subscale scores indicating how often the individual uses that strategy. The current study uses all nine subscales, which have internal consistency that were acceptable to excellent (Self-Blame $\alpha = 0.68$, Blaming Others $\alpha = 0.77$, Rumination $\alpha = 0.79$, Catastrophizing $\alpha = 0.81$, Positive Refocusing $\alpha = 0.80$, Planning $\alpha = 0.79$, Positive Reappraisal $\alpha = 0.81$, Putting into Perspective $\alpha = 0.79$, and Acceptance $\alpha = 0.73$; Garnefski, Kraaij, & Spinhoven, 2002). Internal

consistency estimates for the CERQ-Short subscales in the current study ranged from Cronbach's $\alpha = 0.51 - 0.86$, and 0.69 for the total score. For the current sample, out of a possible 2 to 10, mean scores for each CERQ subscale were as follows: Acceptance ($M = 6.88, SD = 1.90$), Blaming Others ($M = 3.34, SD = 1.14$), Catastrophizing ($M = 3.86, SD = 1.72$), Rumination ($M = 5.68, SD = 1.93$), Positive Reappraisal ($M = 7.00, SD = 1.79$), Positive Refocusing ($M = 4.07, SD = 1.37$), Putting into Perspective ($M = 6.34, SD = 1.84$), Planning ($M = 7.58, SD = 1.30$), and Self-Blame ($M = 4.59, SD = 1.64$).

Child mental health. Child internalizing and externalizing problems were assessed using the Externalizing and Internalizing subscales of the parent-report Behavior Assessment Scale for Children (BASC-2; Reynolds & Kamphaus, 2004). Internalizing and externalizing problems include items from clinical scale scores: aggression, anxiety, conduct problems, depression, somatization and withdrawal. There is currently no large-scale study involving youth with ASD from which psychometric data has been collected; however, the BASC-2 is often used in studies with children with ASD (Mahan & Matson, 2011; Volker et al., 2010).

Psychopathology severity and post-treatment improvement were assessed by an evaluator blind to treatment condition using the Clinical Global Impression Scale – Severity and Improvement (CGI-S and CGI-I; Guy, 1976). The evaluator, who is not involved in treatment provision or data collection, reviewed copies of the child's BASC-2 score summaries and their Anxiety Disorders Interview Schedule for DSM-IV: Parent Version (ADIS-P; Silverman & Albano, 1996) booklets to assess severity of psychopathology (from 0 “no illness” to 6 “serious illness”). The evaluator also documented observed changes between Time 1 and Time 2 and provides an improvement score (from 0 “*very much improved*” to 6 “*very much worse*”). For the current sample at baseline, 13.6% fell into either the “no illness”, “borderline”, or “mild illness”

(0-2) categories, 20.5% were “moderately ill” (3), 22.7% “markedly ill” (4), and 43.2% rated as “severe” or “serious illness” (5-6), $M = 4.02$, $SD = 1.61$.

Procedures

Recruitment & screening. This study was approved by York University’s Research Ethics Board. Participants were recruited via referrals from the community, word of mouth from past participants, autism service e-newsletters and website postings. Interested parents were invited to participate in a telephone screening interview. If screening criteria were met, study procedures were explained, and parents were asked to briefly discuss their child’s challenges with anxiety and/or anger. Parents were then directed to complete the SCQ (Rutter, Bailey, & Lord, 2003) and SRS-2 (Constantino & Gruber, 2012) online. Ninety-eight potential study participants then underwent an in-person screening appointment to confirm that inclusion criteria were met. During this appointment, parental consent and child assent was obtained. Research assistants administered the WASI-II (Wechsler, 2011) to the child to verify IQ. As well, the child was given a questionnaire to assess their willingness to participate fully in the program. Parents participated in the ADIS-P structured interview to assess the presence of child psychopathology (Silverman & Albano, 1996). However, although the SAS:OR intervention targets emotion regulation abilities, which are understood to underlie mental health conditions, the intervention is meant to be preventive in nature. For this reason, a clinically significant score on any measure of psychopathology was not required for children to be included in the study. As well, parents were not required to have clinically significant scores on any measure for study inclusion.

Design. As shown in the CONSORT diagram (Figure 1), once it was determined that inclusion criteria were met, baseline (Time 1) data was collected for 59 participants; 39 were excluded due to not meeting inclusion criteria or declining to participate for other reasons.

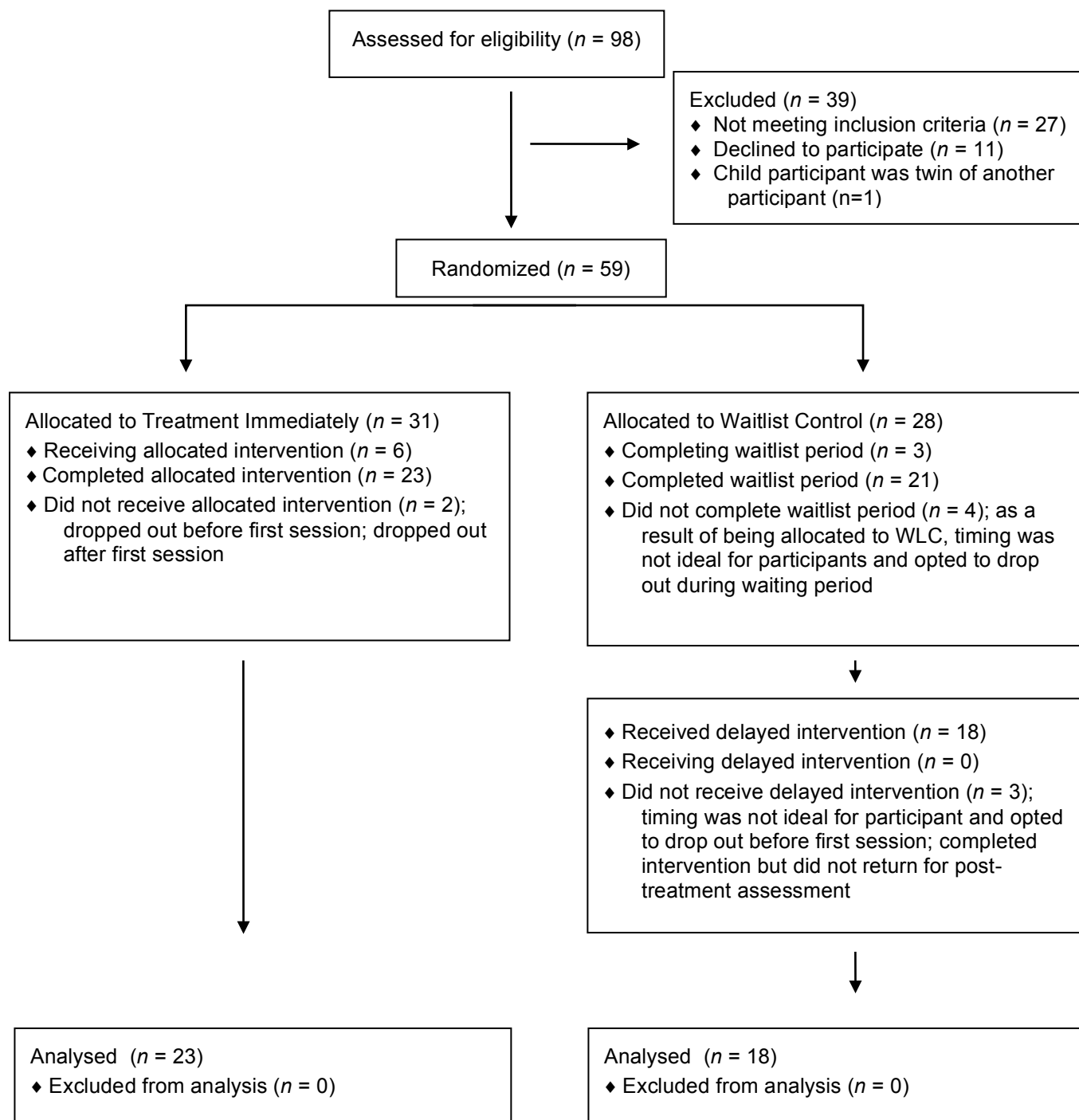


Figure 1. CONSORT flow diagram of participants

Baseline data collection included parents completing the PS, CERQ-Short, DASS-21 and IEM-P online. The AFMSS was obtained during an in-person appointment, and the ADIS-P

interview was completed a second time if the baseline appointment fell more than two weeks after the screening appointment.

Following the baseline appointment, the 59 families were randomized into either the treatment immediate (TI) or waitlist control (WLC) group; The TI group commenced therapy within the week, and the WLC group was instructed not to participate in any other CBT therapy. Children in both groups were free to continue or alter medication regimen or participate in any other service receipt. In the TI group, one family dropped out prior to the first session, one following the first session; in the WLC group, four families dropped out prior to the first session as a result of being allocated to the waitlist group or because of timing issues (see Figure 1).

All child and parent measures were administered again following treatment completion for the TI group and 10-14 weeks post baseline for the WLC to account for the variability in TI Time 2 assessment (Time 2; post-intervention for TI, post-wait period for WLC). For the WLC group, number of days between Time 1 and Time 2 ranged from 63 to 84 ($M = 73.95$ days, $SD = 5.35$). For the TI group, number of days between Time 1 and Time 2 ranged from 63 to 120 ($M = 83.18$ days, $SD = 14.12$ days). The WLC group completed the delayed intervention and then was assessed for a third time (Time 3; post-intervention). Both treatment groups participated in a follow-up appointment 10 weeks following their last therapy session (Time 3 for TI, Time 4 for WLC). As the WLC participants received the treatment following the initial waiting period, there was no follow-up comparison possible between TI and WLC.

Families were reimbursed for parking or public transportation costs at research testing appointments. Children received a small age-appropriate prize following the completion of both therapy and testing appointments.

Intervention. Therapy was provided by graduate students trained in the SAS:OR intervention. The training consisted of one full day involving a didactic session covering material from the manuals and observations of videos of model SAS:OR sessions. Training was followed by a mock session that was videotaped and evaluated to determine therapist readiness to begin providing therapy. Therapist treatment fidelity to the SAS:OR treatment manual was assessed as part of an earlier study on the feasibility of the SAS:OR intervention that included the first 13 participants of the 44 in the current study (Thompson, Burnham Riosa & Weiss, 2015). Overall, the SAS:OR intervention showed high acceptability and clinical utility, and therapists were able to maintain a high level of treatment fidelity (Thompson, et al., 2015). Specifically, a random selection of 26 session videos were coded by two independent observers, and the number of appropriately-delivered components was divided by the total number of components in the manual for each session and multiplied by 100, with overall treatment integrity being 89.6% across coded sessions (Thompson, et al., 2015). For the remaining participants involved in the current study, therapist treatment fidelity to the manual was maintained by having therapists complete checklists containing all session components, and supervisors additionally ensured fidelity by observation of therapy videos during clinical supervision.

Data Analysis

IBM SPSS version 23 was used for all statistical analyses. Statistical significance was evaluated at the alpha .05 level.

Analysis 1. Analysis of covariance (ANCOVA) was calculated to test the hypothesis that parents randomized to the TI condition would show greater changes than parents assigned to WLC condition. Time 2 scores in parent mental health, parenting approaches and EE were treated as dependent variables, while Time 1 (baseline) scores were entered as the covariate.

Child externalizing problems at baseline, as measured by the BASC-2, was entered as a second covariate in each analysis, in order to control for differences in children's baseline scores. For the ordinal EE variable, a binomial logistic regression was computed.

Analysis 2. Paired samples *t*-tests were calculated to test the second set of hypotheses that the entire group of parents (TI and WLC combined) would show improvements in mental health, parenting approaches, and perspectives toward their child over time, from pre- to post intervention.

Analysis 3. A correlational analysis was calculated to test the third set of hypotheses that parent change would be related to parent and clinician reports of child improvements pre-post treatment. Pearson product-moment correlations were calculated to determine associations among change scores for parent and child variables. For ordinal data, Spearman rho correlations were calculated. All change scores were calculated so that higher scores indicated greater improvement.

Results

Preliminary analyses

Group differences at baseline. Groups did not differ at baseline in terms of SCQ or SRS scores, FSIQ-2, or child clinical functioning as measured with the ADIS-P and CGI-S (see Table 1). There was one difference found with respect with child functioning, whereby children in the WLC group had higher externalizing scores on the BASC-2 ($M = 62.81$, $SD = 9.42$) than the TI group ($M = 55.83$, $SD = 7.53$; $t(42) = -2.73$, $p = .009$). Parents in TI and WLC groups did not differ at baseline with respect to any DASS-21, CERQ, PS, or IEM-P subscales.

Analysis 1: SAS:OR Treatment effects

Parent mental health. At Time 2, ANCOVA revealed significant differences between

groups in parent-reported Depression (see Table 2), after controlling for Time 1 scores and child externalizing scores, $F(1, 38) = 5.61, p = .02$, partial $\eta^2 = .13$. Scores did not differ between groups on the Anxiety or Stress scales or overall DASS-21. On the CERQ, the TI group scored higher at Time 2 than WLC on the Acceptance subscale ($F(1, 40) = 4.22, p = .046$, partial $\eta^2 = .10$) and Positive Refocusing subscale ($F(1, 40) = 6.05, p = .02$, partial $\eta^2 = .13$). No other significant differences were found for other CERQ subscales, although there was a trend toward Putting into Perspective being higher for TI, compared to WLC, at Time 2. Overall mean CERQ scores differed at Time 2, $F(1, 40) = 9.07, p = .004$, partial $\eta^2 = .19$.

Table 2

Group differences in Time 2 Scores, Controlling for Baseline and Child Externalizing Scores – Parent Mental Health

Variable	Treatment Immediate Time 2 Mean (SD); n = 23	Waitlist Control Time 2 Mean (SD); n = 21	$F (df1, df2)$	p	Partial η^2
Cognitive Emotion Regulation Questionnaire					
Acceptance	7.43 (1.78)	6.52 (1.97)	4.22 (1, 40)	.046	.10
Blaming Others	3.43 (1.27)	3.43 (.93)	0.33 (1, 40)	.57	
Catastrophizing	3.35 (1.34)	4.43 (1.75)	1.93 (1, 40)	.17	
Rumination	5.57 (1.73)	6.48 (1.69)	1.38 (1, 40)	.25	
Positive Reappraisal	7.13 (1.74)	6.71 (2.05)	2.49 (1, 40)	.12	
Positive Refocusing	4.30 (1.72)	3.52 (1.72)	6.05 (1, 40)	.02	.13
Perspective	6.35 (1.87)	6.05 (1.88)	3.05 (1, 40)	.09	.07
Planning	7.41 (1.44)	6.90 (1.87)	2.54 (1, 40)	.12	
Self-Blame	4.70 (1.87)	4.76 (1.80)	.46 (1, 40)	.50	
Total	3.53 (.35)	3.26 (.46)	9.07 (1, 40)	.004	.19
Depression Anxiety & Stress Scale					
Total Depression	1.82 (2.24)	2.75 (3.27)	5.61 (1, 38)	.02	.13
Total Anxiety	1.48 (1.90)	2.81 (4.09)	.85 (1, 40)	.36	
Total Stress	4.61 (2.33)	6.24 (4.53)	0.25 (1, 40)	.62	
Overall Total	7.68 (5.02)	10.65 (9.34)	2.68 (1, 38)	.11	

Parenting. At Time 2, there were no significant differences between TI and WLC groups

on overall negative parenting, or on any subscales of the Parenting Scale (see Table 3). However, on the IEM-P, groups significantly differed at Time 2 in overall mindful parenting ($F(1, 40) = 5.96, p = .02, \text{partial } \eta^2 = .13$).

Table 3

Group differences in Time 2 Scores, Controlling for Baseline and Child Externalizing Scores – Parenting

Variable	Treatment Immediate Time 2 Mean (SD); n = 23	Waitlist Control Time 2 Mean (SD); n = 21	$F (df1, df2)$	p	Partial η^2
Parenting Scale					
Hostility	1.47 (.58)	1.67 (.88)	1.52 (1, 39)	.23	
Laxness	2.61 (.77)	2.64 (.74)	1.58 (1, 40)	.22	
Over-reactivity	3.43 (1.01)	3.52 (1.05)	0.00 (1, 40)	1.00	
Total	2.97 (.49)	3.09 (.59)	2.09 (1, 40)	.16	
Interpersonal Mindfulness in Parenting					
Total	37.43 (3.85)	36.90 (3.00)	5.96 (1, 40)	.02	.13

Parent expressed emotion. The TI group ($M = .84, SD = .32$) did not differ in their ratio of positive comments compared to the WLC group ($M = .70, SD = .30$), $F(1, 38) = 1.98, p = .17$. A binary logistic regression was performed to test the effects of randomization group, baseline overall EE, and child externalizing problems on the likelihood that parents had borderline/high overall EE scores at Time 2. The overall logistic regression model was significant, $\chi^2(3) = 11.75, p = .008$. The model explained 38.7% (Nagelkerke R^2) of the variance in Time 2 EE score, measured by the AFMSS, and correctly classified 86.0% of cases. However, group membership did not significantly add to the prediction of Time 2 EE scores, when controlling for baseline child externalizing problems and baseline EE scores, Wald $\chi^2(1) = .46, p = .50$.

Analysis 2: Parent functioning outcomes

Parent mental health. Pre to post-intervention, there were no significant reductions on

any subscales of the DASS-21, or on total DASS-21 score (see Table 4). There were no significant changes in any scales of the CERQ, although there was a trend toward improvement in Positive Reappraisal ($t(40) = -1.83, p = .07$) and Positive Refocusing ($t(40) = -1.93, p = .06$; Table 4). Overall parent emotion regulation (CERQ overall mean score) improved from pre- to post- intervention, $t(40) = -2.49, p = .02, d = -.27$.

Table 4

Paired t-Tests from Pre- to Post-Intervention for Entire Sample – Parent Mental Health

Variable	Pre-Intervention Mean (SD) n = 41	Post- Intervention Mean (SD) n = 41	$t(df)$	p	<i>Cohen's d</i>
Cognitive Emotion Regulation Questionnaire					
Acceptance	6.80 (1.93)	7.00 (1.84)	-0.75 (40)	.46	
Blaming Others	3.46 (1.10)	3.24 (1.18)	1.24 (40)	.22	
Catastrophizing	4.00 (1.70)	3.68 (1.54)	1.41 (40)	.17	
Rumination	5.88 (2.00)	5.51 (1.80)	1.55 (40)	.13	
Positive Reappraisal	6.76 (1.89)	7.05 (1.84)	-1.83 (40)	.07	-.15
Positive Refocusing	3.59 (1.47)	4.05 (1.61)	-1.93 (40)	.06	-.30
Perspective	6.05 (1.84)	6.34 (1.97)	-1.12 (40)	.27	
Planning	7.30 (1.71)	7.28 (1.44)	0.11 (39)	.92	
Self-Blame	4.49 (1.66)	4.63 (1.81)	-0.61 (40)	.54	
Total	3.37 (.41)	3.48 (.38)	-2.49 (40)	.02	-.27
Depression Anxiety & Stress Scale					
Total Depression	2.85 (3.46)	2.28 (3.16)	1.67 (38)	.10	
Total Anxiety	2.12 (3.28)	1.92 (2.60)	0.70 (40)	.49	
Total Stress	5.51 (3.87)	5.21 (3.41)	0.83 (40)	.41	
Overall Total	9.74 (8.24)	8.87 (7.43)	1.32 (38)	.20	

Parenting. Following the intervention, there were no significant changes on any individual subscales of the Parenting Scale, though there was a trend toward overall scores on this measure being lower post-intervention ($t(40) = 1.92, p = .06, d = .21$; see Table 5). Parents significantly improved from pre- to post-intervention on total mindful parenting on the IEM-P ($t(40) = -2.99, p = .005, d = -.34$).

Table 5

Paired t-Tests from Pre- to Post-Intervention for Entire Sample - Parenting

Variable	Pre-Intervention Mean (SD) n = 41	Post-Intervention Mean (SD) n = 41	<i>t(df)</i>	<i>p</i>	<i>Cohen's d</i>
Parenting Scale					
Hostility	1.58 (.83)	1.47 (.62)	1.57 (38)	.12	
Laxness	2.61 (.78)	2.50 (.73)	1.29 (40)	.21	
Over-reactivity	3.35 (1.07)	3.37 (1.11)	-0.61 (40)	.54	
Total	3.04 (.55)	2.92 (.55)	1.92 (40)	.06	.21
Interpersonal Mindfulness in Parenting					
Total	36.61 (3.20)	37.73 (3.30)	-2.99 (40)	.005	-.34

Parent expressed emotion. Following the intervention, there were no significant changes on any of the AFMSS subscales. However, there was a trend toward ratio of parents' positive comments increasing from pre- to post-intervention, $t(38) = -2.03, p = .05; d = .29$; see Table 6.

Table 6

Pre- to Post-Intervention Differences for Entire Sample – Expressed Emotion

Variable	Pre-Intervention Mean (SD) n = 41	Post-Intervention Mean (SD) n = 41	<i>Z or t(df)</i>	<i>p</i>	<i>Cohen's d</i>
Overall Expressed Emotion ^a	0.22 (.42)	0.15 (.36)	-1.13	.26	
Ratio of Positive Comments ^b	0.72 (.26)	0.81 (.33)	-2.03 (38)	.050	-.29

^a Wilcoxon Signed Ranks Test

^b Paired Student *t*-Test

Analysis 3: Associations with child functioning

Parent mental health. At post-intervention, unexpectedly, parent improvement in Acceptance on the CERQ was correlated with *less* improvement in child externalizing symptoms on the BASC-2 ($r = -.32, p = .04$). There was a trend toward Putting into Perspective being

correlated with overall child clinical change according to clinician judgment on the CGI ($r = .27$, $p = .09$; see Table 7). Reductions in child internalizing symptoms on the BASC-2 were related to parent reductions in Catastrophizing ($r = .41$, $p = .008$) on the CERQ, overall mean CERQ score ($r = .47$, $p = .002$) and trending toward changes in Putting into Perspective ($r = .26$, $p = .099$). Total Depression on the DASS-21 was also related to reductions in child internalizing problems ($r = .34$, $p = .04$), and there was a trend toward a relation between change in parent-reported Depression on the DASS-21 and overall child clinical change ($r = .29$, $p = .08$).

Table 7

Pearson Correlations Between Child Changes and Changes in Parent Mental Health

Parent Changes	Child Changes		
	CGI Severity	Internalizing Problems	Externalizing Problems
Cognitive Emotion Regulation Questionnaire			
Acceptance	.22	.10	-.32*
Blaming Others	.05	.13	.16
Catastrophizing	-.13	.41**	-.08
Rumination	-.24	.14	.01
Positive Reappraisal	.15	.22	-.08
Positive Refocusing	.25	.13	-.06
Perspective	.27 ⁺	.26 ⁺	.00
Planning	.09	.16	-.21
Self-Blame	.03	.01	.04
Total	.22	.47**	-.17
Depression Anxiety & Stress Scale			
Total Depression	.28 ⁺	.34*	-.07
Total Anxiety	-.15	-.09	-.29
Total Stress	.11	.11	-.02
Overall Total	.17	.14	-.23

⁺ $p < .10$; * $p < .05$; ** $p < .01$

Parenting. Improvement in child internalizing symptoms on the BASC-2 was correlated with improvement in parent Hostility ($r = .43$, $p = .007$) and Laxness ($r = .42$, $p = .007$) on the Parenting Scale, and overall PS score ($r = .35$, $p = .03$; see Table 8). Overall child clinical change according to clinical judgment on the CGI was associated with a trend toward change in parent

Hostility ($r = .28, p = .09$) and parent Laxness ($r = -.30, p = .06$), although the relation between Laxness and child clinical change was in the opposite direction than expected. Improvements in mindful parenting were not correlated with any child changes.

Table 8

Pearson Correlations Between Child Changes and Changes in Parenting

Parent Changes	Child Changes		
	CGI Severity	Internalizing Problems	Externalizing Problems
Parenting Scale			
Hostility	.28 ⁺	.43**	.16
Laxness	-.30 ⁺	.42**	.04
Over-reactivity	.01	.24	-.05
Total	-.11	.35*	.06
Interpersonal Mindfulness in Parenting			
Total	.09	-.04	-.04

⁺ $p < .10$; * $p < .05$; ** $p < .01$

Expressed Emotion. Improvement in parents' ratio of positive comments about their child on the AFMSS was associated with improvements in child internalizing problems on the BASC-2 ($r = .36, p = .02$; see Table 9). Reduction in overall EE was not associated with any child changes.

Table 9

Correlations Between Child Changes and Changes in Parent Expressed Emotion

Parent Changes	Child Changes		
	CGI Severity	Internalizing Problems	Externalizing Problems
Overall Expressed Emotion ^a	.15	.16	.09
Ratio of Positive Comments ^b	.13	.36*	.17

^a Spearman's rho

^b Pearson's r

⁺ $p < .10$; * $p < .05$; ** $p < .01$

Discussion

Given the high occurrence of comorbid mental health problems in children with ASD, it is critical to develop and test interventions targeted specifically toward this population. However, the significant variability with respect to treatment success following CBT for children with ASD suggests that research is needed to identify variables that contribute to good treatment outcomes. Osborne and colleagues (2008) found that in some cases, parenting stress reduces the positive effects of early teaching intervention participation for young children with ASD. In that study, when participants were divided into four groups based on parent stress level (low/high) and intervention time-intensity (low/high), those children in the low parental stress group experienced greater intellectual, educational and adaptive behavioural gains when intervention time-input was higher, whereas those in the high parental stress group did not experience any additional benefit from higher intervention-time input. That study highlights the important impact that parent mental health can have on children's treatment gains. In addition, an examination into the ways in which the wellbeing of parents of children with ASD might be improved following their children's interventions is worth investigation in its own right. For these reasons, there has been a call to routinely examine parent and family outcomes as part of evaluations of interventions for children with ASD (Karst & Van Hecke, 2012).

This study is the first to focus primarily on parent outcomes following child participation in CBT. We examined parent outcomes in three domains: parent mental health, parenting, and expressed emotion, in order to test whether parents reported their own improvements following participation in a child-focused CBT intervention. The randomized waitlist controlled design of the study also allowed a test of whether the SAS:OR intervention had a direct effect on these variables, while controlling for the effects of time and child externalizing problems. It was

expected that parents would show improvements in self-reports of mental health, parenting, and expressed emotion post-intervention, that parent changes would be related to parent- and clinician-reports of child changes post-therapy, and that parents randomized to the SAS:OR intervention would show greater improvements than those in the waitlist control condition.

Findings partly supported these hypotheses, revealing that following participation in their children's CBT, small treatment effects occurred with regard to the treatment group parents' self-report of mindful parenting, depression, and use of adaptive emotion regulation strategies, compared to parents in the waitlist control group. There were also small to moderate treatment effects occurring across all parent participants with regard to perceptions of their children, mindful parenting, and use of adaptive emotion regulation strategies. Given that no aspect of the intervention directly targeted parenting, the parent-child relationship, or parent mental health, these results are notable and worth discussion and further study.

Parent Mental Health

This type of investigation is unique in that it examines multiple aspects of parent mental health post-treatment. In other studies evaluating child interventions, when parent outcomes are included in the design, they typically include either change in parent anxiety (i.e. Reaven Washington, Moody, Stern, Hepburn & Blakeley-Smith, 2015) or stress (i.e. Weiss, Viecili & Bohr, 2014) post-intervention, but parent mental health outcomes more broadly are less often explored. In this study, contrary to expectation, there were no significant changes in parent-reports of anxiety or stress post-intervention. One proposed reason for the difference in the current study is that these parents were, on average, a non-clinical sample, with initial levels of stress and anxiety being quite low. Since less than 10% of parents fell into the moderate or high

range at baseline, and some parents endorsed very few symptoms, there may have been less opportunity for these scores to change.

There was, on average, a one-point difference in self-reported symptoms of depression between parents who had completed the intervention and those who had not yet done so, while controlling for time effects, indicating that the SAS:OR intervention had a direct impact on this change. Parent depression as an outcome has not been measured before in the context of CBT for children with ASD. One randomized controlled trial of a social skills program for 18 children with ASD found no significant pre-post differences in parental depression, as measured with the Beck Depression Inventory, though included only a total of 9 participants in the paired samples *t*-test (Solomon, Goodlin-Jones & Anders, 2004). In the current study, when treatment and control groups were combined, there was also no difference found post-intervention in parental depression. It is possible that the results of both studies were affected by relatively small participant numbers, as *t*-tests on smaller samples have only sufficient power to detect large effects.

On another indicator of mental health, use of emotion regulation strategies, parents who had participated in the intervention scored higher on Acceptance (accepting the events one has experienced), Positive Refocusing (thinking about pleasant matters instead of focusing on the negative event) and overall mean emotion regulation (more frequent use of adaptive and less frequent use of maladaptive strategies) than the control group, suggesting that SAS:OR had a direct impact on the frequency at which parents reported using these strategies. When groups were combined, parents had significantly higher use of positive emotion regulation strategies overall post-intervention. Many models of positive parental coping exist that highlight how crucial they are to wellbeing in parents of children with ASD. For instance, Hastings and

colleagues (2005) used factor analysis to identify key coping dimensions pertinent to parenting a child with autism, and found that one of their proposed dimensions, positive coping (including use of humour, positive reframing, and acceptance), was associated with lower levels of depression in their sample of mothers and fathers. In another study that looked at the effectiveness of coping styles in parents of children with developmental disabilities, positive reappraisal was the coping strategy most highly associated with parents' perceptions of their own and their child's wellbeing (Glidden, Billings & Jobe, 2006). The results of the current study suggest that psychological mechanisms of emotional wellness may improve as a result of successful participation in child cognitive behavioural treatment.

Parenting

One area of interest in the literature on supporting parents of children with ASD involves mindful parenting. Until now, mindful parenting has never been examined within the context of child psychotherapy, unless it is assessed in a trial in which parents also receive a mindfulness intervention (i.e. Oord, Bögels, & Peijnenburg, 2012). In the current study, there were differences seen between treatment and control groups, following intervention and wait list respectively, for overall mindful parenting. Further, when groups were combined, there were improvements from pre- to post intervention on mindful parenting overall. The SAS:OR intervention helps children use cognitive and behavioural strategies to manage anger, sadness and anxiety. Therapists also utilize techniques used in mindfulness practice, including body scans, breathing awareness exercises, and thought imagery (i.e. imagining thoughts floating away). Although these strategies are taught to child participants, their parents practice these activities in session alongside their children and are asked to do so at home as well. In programs that teach mindfulness strategies to parents of children with ASD and other development

disabilities, it has been found that parenting stress decreases post-intervention (Neece, 2014; Singh et al., 2014), which has been proposed to reduce parental reactivity and improve the parent-child relationship, making other aspects of parenting easier as well (Bögels, Lehtonen & Restifo, 2010). It may be that when parents participate in these mindfulness activities with their children, in a way that is supported by a therapist, they subsequently engage in more mindful parenting, intentionally and non-judgmentally paying attention to their child and compassionately reflecting on their own parenting ability.

There were no significant improvements seen for negative parenting, as measured with the Parenting Scale, either when comparing conditions at Time 2, or when looking at groups combined. This could be due to very low levels of negative parenting practices endorsed by parents at baseline. For instance, for hostile parenting, out of a possible score of 7 (reflecting highest level of hostility), parents scored an average of 1.59. With low scores on these measures at baseline, change in these outcomes post-intervention may be less detectable.

Expressed Emotion

The current sample displayed relatively little variability with respect to expressed emotion. Very few parents described negative parent-child relationships or made negative initial statements, or had low warmth toward their child. No parents had high emotional over-involvement. These are the subscales that would contribute to borderline or high expressed emotion. This lack of variability is reasonable in the context of the current sample, which was a treatment-seeking sample of parents with relatively low levels of mental health difficulties. This lack of variability though also likely contributed to low level of change in parent expressed emotion from pre to post intervention or between TI and WLC groups. In other studies of expressed emotion with families of typically developing children and children with psychiatric

disorders, both higher maternal depression (Tompson, Pierre, Boger, McKowen, Chan, & Freed, 2010) and parental psychopathology more generally (Hibbs, Hamburger, Lenane, Rapoport, Kruesi, Keysor, & Goldstein, 1991) have been related to higher levels of expressed emotion. It is possible that the low reported levels of parental depression, stress and anxiety in the current sample resulted in lower parental EE.

One component of expressed emotion that was shown to change following intervention completion was the ratio of parents' positive comments about their children, in relation to overall comments in the speech sample. Prior to intervention completion, approximately 72% of parents' comments were positive, whereas following the intervention, 81% of parents' comments were positive. Although not significantly different when controlling for externalizing problems, parents in the treatment group made more positive comments (84%) at Time 2 than WLC participants, who made only 70% positive comments. Studies that include measures to assess resilience in families of children with disabilities have provided evidence for a model in which when parents are able to perceive, appraise and make meaning of their child's disability, they are better able to use family resources to cope (Bayat, 2007; Hastings & Taunt, 2002). It may be that supporting children through the challenges of a 10-week intervention allow parents to better perceive or reflect on their children's strengths.

Associations with Child Changes

Examining the associations between post-intervention parent changes and child changes provided context and meaning to the observed effects of the intervention on parents. In this sample, parent reports of reductions in children's internalizing problems, which include anxiety, depression and somatization (Reynolds & Kamphaus, 2004), were associated with several parent

changes. Overall, the correlations found between parent change and child change are considered small to moderate, ranging from .26 to .47.

In the expected direction, it was found that reductions in parent Catastrophizing, increases in overall use of adaptive emotion regulation strategies, and reductions in parent depression were associated with improvements in parent-reported child internalizing problems. These observations align with other research examining the relation between child internalizing problems and parent depression and emotion regulation. In typically developing children, maternal depression is strongly related to parent report of child internalizing problems (Coyne & Thompson, 2011; Goodman, Rouse, Connell, Broth, Hall, & Heyward, 2011; Silk, Shaw, Forbes, Lane, & Kovacs, 2006). Coyne and Thompson (2011) found that factors related to emotion regulation, including parents' perceived locus of control, were also associated with child internalizing problems. They also identified that the relation between parent depression and parent reports of child internalizing problems was mediated by parents' perceived locus of control, suggesting that as mothers' depressive symptoms increase, those who feel more in control in their parenting role observe less negative mood/internalizing problems in their children. Our study provides further support for relations between child internalizing symptoms, and parent mental health and emotion regulation, and further research could provide more insight into whether the above model is similar for families of children with ASD.

Children who had parent-reported reductions in internalizing problems also tended to have parents who improved with respect to other parenting dimensions, including Hostility, Laxness, and overall negative parenting. This is in line with a recent study that found that among 615 parents of typically developing children, higher levels of negative parenting practices were associated with higher levels of youth internalizing and externalizing problems (Parent, McKee,

Rough & Forehand, 2015). Parent and colleagues also found associations between higher levels of mindful parenting, using the same IEM-P measure used in the current study, and lower levels of child internalizing and externalizing problems. The current study did not reveal any associations between child changes and changes in mindful parenting, which is possibly a result of a lower sample size in the current study, or the fact that Parent used a different measure of child psychopathology, the Brief Problem Checklist (Parent et al., 2015).

In the present investigation, parent-reported improvements in child internalizing problems were associated with improvements in parents' overall speech about their child: those parents who tended to report more positive comments at post intervention about their child also tended to report that their children's internalizing problems decreased. Although positive and critical comments were coded for valence rather than for content, it was observed that many critical comments that parents made about their children were about the effect of child anxiety and externalizing problems on themselves and the family, and it would be expected that the amount of critical comments would change if parents observed improvements in these areas.

Contrary to expectation, it was found that there was a relationship between parents' increased use of Acceptance post-treatment and *less* change in child externalizing problems. In fact, this association was the only observed between parent change and child externalizing problems. Acceptance, in this context, is a cognitive coping strategy that can be used to internally manage emotions associated with negative or unpleasant events. It involves accepting the events one has experienced and resigning oneself to what has happened (Garnefski, Kraaij & Spinoven, 2002). Overall, acceptance is considered to be a functional coping strategy for most situations (Garnefski et al., 2002), and in the case of parents of children with ASD, greater use of acceptance, along with other cognitive reframing techniques, has been shown to be associated

with higher levels of parental wellbeing (Benson, 2010). It seems that use of acceptance mediates the relation between child behavioural problems and parental distress, whereby the deleterious effect of child problems on parental distress is attenuated by greater use of acceptance by mothers and fathers (Jones, Hastings, Totsika, Keane, & Rhule, 2014; MacDonald, Hastings and Fitzsimons, 2010; Weiss, Cappadocia, MacMullin, Vecili, & Lunsy, 2012). Given that these types of behaviours are a consistent predictor of maternal outcomes (Abbeduto, Seltzer, Shattuck, Krauss, Orsmond, & Murphy, 2004) and can transact with parent stress over time (Lecavalier, Leone, & Wiltz, 2006), it is imperative that parents find ways to cope with such problems. In the current study, it may be that following participation in an intervention that involves teaching and practice around cognitive coping strategies, parents who observe less change in their children's behaviour problems become better able to draw upon their own internal resources and engage in acceptance of their child's challenging behaviours.

Limitations

The current study has multiple limitations. First, although many statistical analyses allow for a thorough exploration into the nature and strength of possible treatment effects, multiple analyses also increase the possibility of type I error. At the same time, although 44 is a relatively large sample size for an RCT of this duration, it may not have been large enough for the *t*-tests used to have sufficient power to detect smaller effects. Given that only small to medium effect sizes were found in this study, a larger sample would likely allow for greater sensitivity to detect change. However, given that no aspect of this particular intervention actually targeted any aspect of parent functioning, parenting, or the parent-child relationship, large effect sizes were not expected.

Additionally, although Clinical Global Impression was included as an objective measure of child functioning and of clinically-significant improvement, it was associated with few parent changes in this study. Most relations observed were between parent self-reports of their own changes, and parent-report of child internalizing problems. When the same method (i.e. one respondent filling out questionnaires) is used to assess multiple variables and determine associations between them, the potential for shared method variance arises, which can lead to an overestimation of the degree to which those variables are related. On the other hand, given that the same patterns were not seen for child externalizing problems, this issue may not have been overly impactful. Nonetheless, given that there were also no measures of parent functioning other than self-report, future research could benefit from employing different methodologies as well, such as observer-rated reports of child emotion regulation ability or parenting behaviour during structured tasks.

Finally, follow-up with participants is an important aspect of determining whether and how treatment effects are sustained over time. Since waitlisted dyads participated in treatment after the initial wait period and follow up data was not collected for those participants who did not complete treatment, 10-week follow up data from the TI group cannot be compared to that of a group who did not participate in treatment.

Future Directions

Exploring whether treatment effects extend past post-treatment is critical. It would be beneficial to follow up longitudinally with families to determine whether there is a long-term benefit to participation in this brief intervention. Further, given that the exploration into associations between parent and child changes relied on correlational data, a longitudinal design could explore the directionality of associations between child and parent variables, determining,

for instance, whether parents exhibit improvements because their child's internalizing problems improve, or whether this relationship operates in the opposite direction. In addition, given that there is little work on parent outcomes following participation in their child's therapy, future research could explore the quality of therapy sessions in more depth, in order to better elucidate what mechanism of the intervention is most important for parent change. Given that in the SAS:OR intervention parents are expected to act as coaches, or "co-therapists", helping to support their children during therapy and assist them in transferring skills learned to other environments, qualitative interviews could also be used to explore with parents what this experience was like for them and how therapists and session content might be most helpful toward this aim.

Finally, this particular sample was a motivated subset of parents who had elected to participate in a research trial and who had relatively low levels of depression, anxiety and stress. In other treatment settings, parents and families might be dealing with additional stressors that impact their mental health, parenting strategies, and levels of expressed emotion. Future research could determine whether the observed effects are specific to self-selected parents with low levels of mental health difficulties, such as those in the current sample, or whether families with additional stressors might also experience the same benefits when their children participate in CBT.

Conclusion

This study was the first to evaluate parent outcomes following the participation of their children with autism spectrum disorder in a cognitive behavioural therapy program. We found that parents can experience changes in multiple domains of functioning following involvement in their children's treatment. These results support the efficacy of the SAS:OR program for

indirectly affecting parents. These effects on parents have implications for using parent-report of child change as a basis for evaluating child improvement. It is possible that when parents are asked about their child's functioning following intervention participation, parents could be providing better reports as a result of their own mental health and coping improving. The results as a whole suggest changes in parent functioning should be taken into account when relying on parent reports of child functioning.

It should be emphasized that treatment effects for parents were small overall, and the mechanism of observed change is not well understood at this point. Nonetheless, future research could help determine which aspects of parent involvement in child CBT are most helpful to both children and families, in order to provide better insight into the therapeutic factors that contribute to therapy gains and overall wellbeing for children with ASD and their families. This study provides support for the usefulness of a broader assessment approach when testing the efficacy of interventions for children, and suggests that an evaluation of the impact of a program is incomplete without the inclusion of measures that explore the impact of the intervention on other systems that impact the child.

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