Therapeutic Alliance in Cognitive Behaviour Therapy for Children with Autism

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Abstract

This study aimed to determine child pre-treatment variables, therapist behaviours and treatment outcomes associated with early and late therapeutic alliance in cognitive behaviour therapy for children with autism. Data were collected from 48 children with autism (91.7% male) who demonstrated average verbal IQ. Therapists included 22 post-doctoral fellows or graduate trainees (90.9% female). Therapeutic alliance and therapist behaviours were measured using observational coding of early and late sessions. Pre-treatment and outcome measures included multiple informant reports of child emotional and behavioural functioning. Results indicate some relation between emotion regulation and symptom severity, and the quality of alliance. Early therapist behaviours were associated with late therapeutic bond. Pushing the child to talk early on predicted later task-collaboration. Early therapeutic alliance did not predict treatment change. Late task-collaboration predicted improvements in emotion regulation. Future research should further examine the role of task-collaboration as a mechanism of treatment change for children with autism.

Keywords: autism, children, therapeutic alliance, cognitive behaviour therapy

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Background

Autism Spectrum Disorder is a neurodevelopmental condition characterized by social and communication deficits, and restricted, repetitive behaviors and interests, typically present in early childhood (American Psychiatric Association 2013). Most recent prevalence estimates report 1 in 66 Canadian children aged 5-17 years have a diagnosis of autism, with significantly greater occurrences in males (23.9 per 1,000) compared to females (6.0 per 1,000; Ofner et al., 2018). In accompaniment with core challenges, children with autism frequently experience associated internalizing and externalizing problems. It is estimated that 70% of children with autism meet criteria for at least one comorbid psychiatric disorder, and approximately 40% meet criteria for two or more (Leyfer et al., 2006; Simonoff et al., 2008). Beyond a formal psychiatric diagnosis, children with autism often exhibit behavioural problems, such as strong emotional outbursts and tantrums, aggressive behaviour towards others, and non-suicidal self-injury, which may be explained by an overarching struggle with emotion regulation (Mazefsky, Pelphrey & Dahl, 2012; Mazefsky & White, 2014; Weiss, 2014). In order to address these behavioural and affective disturbances, various psychosocial interventions have been adapted and implemented with children with autism.

For children who are able to communicate verbally, cognitive behaviour therapy (CBT) has been shown to be efficacious in reducing psychiatric symptoms (Danial & Wood, 2013). In particular, CBT interventions have largely focused on treating anxiety symptoms among children and adolescents with autism, yielding small to medium effects, dependent upon informant (i.e., child self-report vs. parent-report vs. clinician-report; Weston, Hodgekins & Langdon, 2016). Preliminary results of CBT intervention trials focusing on emotion regulation have shown similar results, with children exhibiting greater emotion regulation following therapy completion

(Scarpa & Reyes, 2011; Thomson, Burnham Riosa & Weiss, 2015). A recently completed randomized-controlled trial of CBT targeting emotion regulation in children with autism has also demonstrated significant improvements in emotion regulation, and in associated psychiatric comorbidities (Weiss et al., 2018). Although findings have been promising thus far, only a portion of individuals with autism who take part in therapeutic interventions demonstrate significant gains (Vasa et al., 2014). The question then is *why*? Amassing research has shed light on *what* works in reducing emotional and behavioural challenges, but in order to refine and maximize treatment effects for children with autism, focus needs to be directed towards understanding mechanisms of therapeutic change.

Common Factors of Therapy

Therapeutic factors are organized into four broad categories (Miller, Duncan & Hubble, 1997): (1) therapeutic techniques, (2) expectancy and hope, (3) extratherapeutic factors, and (4) relationship factors. Therapeutic techniques refer to the individual therapist's theoretical orientation, as well as the specific methods, strategies and skills employed in session with their clients. This would include the use of specific cognitive behavioural techniques such as identifying and restructuring cognitive distortions. Though often considered to be the most important aspect in explaining therapeutic effects, specific techniques do not solely contribute to treatment success (Ahn & Wampold, 2001; Messer & Wampold, 2002).

There has been a longstanding belief that therapeutic change can be explained by factors that are common across treatment modalities. Rosenzweig (1936) proposed that these shared factors serve as mechanisms of change, which differ from specific techniques that are suspected of contributing to treatment success. This notion has carried forward for almost a century, and has been evidenced through amassing empirical support (Drisko, 2004; Luborsky et al., 2002;

Messer & Wampold, 2002). Client expectations and hope, and extratherapeutic and relationship factors are considered to be common across treatment modalities, and have been found to explain a significant portion of variation in therapeutic outcomes. Expectancy and hope refer to the client's belief in the efficacy of the treatment and their hopefulness for improvement. This is often described in clinical trials as expectancy or placebo effects, which undoubtedly influences the client's level of involvement in treatment, and ultimately treatment outcome (Lewin, Peris, Bergman, McCracken & Piacentini, 2011; Messer & Wampold, 2002; Westra, Dozois & Marcus, 2007). Extratherapeutic factors, which include client-specific characteristics (e.g., presenting problem, personality traits), environmental resources (e.g., family support, available services), as well as session-related behaviours such as the quality of their participation, are considered the most important contributor to therapeutic outcome (Miller, Duncan & Hubble, 1997). However, these extratherapeutic factors are often elements beyond the therapist's control. Instead, the therapist needs to adapt and work flexibly with the individual client to form a strong working relationship in which personal growth can be stimulated (Rogers, 1979). This leads to the final common factor outlined by Miller and colleagues (1997) – *relationship factors*; more specifically, the therapeutic alliance.

Therapeutic Alliance. The therapeutic alliance has been described by Messer and Wampold (2002) as "truly pan-theoretical" (p. 23) as it is recognized as an important contributor to treatment outcome across numerous therapeutic modalities, for a variety of clinical populations (Horvath & Luborsky, 1993; Lambert & Barley, 2001). It has alternatively been referred to as the therapeutic relationship, working alliance, or working relationship, which are used interchangeably in the text to follow.

Historical Background. In outlining the conceptual origins and development, Hovath and Luborsky (1993) note that consideration of the therapeutic alliance traces back to Freud's (1913) psychodynamic perspective on beneficial transference, and his later work on the importance of client-therapist attachment in the healing process. Subsequent psychodynamic theorists proposed several ideas around this original conceptualization, with ongoing debate as to whether alliance and transference were related or distinct constructs. Still, the majority of theorists recognized the importance of defining the alliance within the context of psychoanalysis and considering its role in the therapeutic process.

Emphasis on the importance of the therapeutic alliance in the treatment process was also made within the client-centered approach to therapy. Rogers (1957) argued that empathic understanding, congruence and unconditional positive regard portrayed by the therapist towards the client were both necessary and sufficient conditions of therapeutic success. He asserted that "as the person is accepted and prized [by the therapist], he or she tends to develop a more caring attitude toward him or herself; as the person is empathically heard [by the therapist], it becomes possible for him or her to listen more accurately to the flow of inner experiences" (Rogers, 1980, p. 116). In order to foster treatment gain, the therapist must form a therapeutic atmosphere and relationship with the client through empathy, acceptance and congruence. Research has demonstrated a strong association among the therapist-offered conditions and therapeutic alliance, suggesting they may occur in parallel, or that one may serve as a causal factor to the other. However, there are conceptual and theoretical differences between the two with alliance being more strongly associated with to therapeutic outcome (Horvath & Luborsky, 1993). Similar findings have been demonstrated in therapies for children, with therapist interpersonal skills, such as empathy and positive regard, and therapeutic alliance being moderately related to

each other, and separately associated with treatment outcome (Karver, Handelsman, Fields & Bickman, 2006).

The therapeutic alliance has also been conceptualized as a dynamic process, dependent upon the phase of therapy in which the client is in. Luborsky (1976) delineated two types of the helping alliance: Type 1 being present early in therapy, based on the client's perception of support or help provided by the therapist; and Type 2 being more apparent later on in treatment, demonstrated through attainment of treatment goals by working together. Research has shown that the implications of therapeutic alliance on treatment outcome varies over the course of therapy. In therapies for adults, the quality of alliance early on in the therapeutic process (e.g., within the first third of therapy) better predicts treatment outcome than the quality of alliance later on (e.g., in the last third of therapy; Horvath et al,. 2011). Some research with children has shown the reverse pattern of influence, with late therapeutic alliance being more strongly associated with outcome, compared to early alliance or an average rating of alliance across all sessions (McLeod, 2011; Ormhaug, Jensen, Wentzel-Larsen & Shirk, 2014; Shirk and Karver, 2003). However, significant differences between early and late alliance with children have been inconsistent (McLeod, Southam-Gerow & Kendall, 2017).

Bordin (1979) further expanded on the definition of therapeutic alliance, describing it as a working relationship between therapist and client. Unique to previous conceptualizations of therapeutic alliance, he considered the active role the client plays in the therapeutic process and the transactional nature of this relationship; the quality of the therapeutic alliance does not rely solely on the therapist, but simultaneously on attributes specific to the client (Bordin, 1994). He added that the relationship is based upon collaboration on therapeutic tasks within the therapy session, mutually agreed upon objectives or goals of therapy, and a positive bond that includes

mutual trust, acceptance and confidence (Horvath & Luborsky, 1993). Based on Bordin's conceptualization, a substantial body of research has aimed to empirically evaluate the therapeutic alliance (Elvins & Green, 2008), and determine its implications for treatment outcomes. The majority of research in this area has focused on therapy with adults, which do not capture developmentally relevant variables, such as cognitive, behavioural and emotion capacities, that may have noteworthy implications in therapy involving children (Zack, Castonguay & Boswell, 2007). It is important to recognize that the way therapeutic alliance is conceptualized in research with adults may not directly apply within the context of child-focused treatments. However, many of the tools used to assess therapeutic alliance in therapy with children consider the bond, tasks, and goals, as outlined by Bordin (McLeod, 2011).

Research in Child Populations. There has been a growing body of research that has examined the association between therapeutic alliance and treatment outcome in various forms of therapy for children. Results from recent meta-analyses studies have shown to vary from no relation to a moderate relation between therapeutic alliance and treatment outcome in child-focused therapies ($r = .02$ to .55; Karver et al., 2006; McLeod, 2011; Shirk, Karver & Brown, 2011). In the most recent, and largest meta-analysis to date, McLeod (2011) examined 38 studies that assessed alliance-outcome associations in child-focused therapy. Inclusion criteria were based on previous meta-analyses looking at effects of therapeutic alliance in both child and adult populations. The 38 studies that met inclusion criteria were completed between 1992 and 2009, with the majority ($n = 30$) being completed after 2003 (upper limit of year range for previous meta-analysis). Collectively, the studies included 2800 youth between 7 and 17 years of age ($M = 13.30$, $SD = 3.02$), being treated for problems with substance abuse ($n = 13$ studies), internalizing problems ($n = 8$ studies), externalizing problems ($n = 5$), or eating disorders ($n = 2$

studies), or a combination of these problems (n = 10 studies),. Across studies, there were 45 different treatment groups (n = 20 behavioural; 25 non-behavioural) with therapy durations between 7 and 49 weeks (M = 16.38, SD = 8.21). Only 14 of these therapy programs were clearly child-focused. Overall, results indicated a small, positive relation between therapeutic alliance and treatment outcome (r = .14), accounting for approximately 2% of outcome variance. This association was smaller than estimates previously reported in research with children (Karver et al., 2006) and adults (Martin, Garske & Davis, 2000). Since 2011, there have been studies published that found a stronger relation between therapeutic alliance and outcome in child-focused therapies (Kazdin & Durbin, 2012; Marker, Comer, Abramova & Kendall, 2013; Ormhaug et al., 2014).

Child characteristics have been shown to moderate the strength of the relation between therapeutic alliance and outcome. McLeod (2011) found that alliance and outcome were more strongly associated for children under the age of 13, compared to children 13 years and older. There was also a stronger relation between alliance and outcome for children who actively sought treatment, versus those who were recruited, those who were court-ordered, and those in studies who did not report referral source. The strength of this association may also be moderated by child clinical characteristics, with a larger effect being found for children with a combination of challenges and externalizing problems, compared to children with internalizing and substance abuse problems. Social skills and interpersonal factors have too been shown to be a significant predictor of the quality of therapeutic alliance, with better social competence, and more security in social relationships being positively associated with alliance (Kazdin & Durbin, 2012; Levin, Henderson & Ehrenreich-May, 2012). Though it is unclear whether this moderates the relation between alliance and outcomes, this could have important implications in therapy for children

with autism. Generally, treatment characteristics do not appear to influence the relation between therapeutic alliance and outcome. Therapy type (i.e., behavioural vs. non-behavioural), therapy format (i.e., child-focused vs. family focused vs. parent-focused), and therapist credentials (i.e., professional vs. graduate student vs. paraprofessional) are not found to moderate the strength of the association between alliance and treatment outcomes (Karver et al., 2006; McLeod, 2011). However, relevant to the current research study, a more recent study has shown that therapeutic alliance was positively associated with treatment outcome within CBT, but had no relation for a comparison group receiving non-behavioural therapy (Ormhaug et al., 2014).

Beyond child and treatment-specific factors, researchers have examined differences in the alliance-outcome association as a function of reporting source. In their meta-analysis, Shirk and Karver (2003) note that children may not be equipped with the social and cognitive skills needed to assess their own therapeutic alliance. Ceiling effects may also be observed in child-reports of alliance because ratings are only provided by a subgroup of children who remain in treatment (Accurso & Garland, 2015). It has been argued that reports on process and outcome variables from the same source may potentially bias results, as evidenced by the higher effect sizes observed in studies with a single informant, compared to those with multiple informants (Horvath & Symonds, 1991; McLeod, 2011). Although the therapeutic alliance is undoubtedly a subjective experience for both client and therapist, objective techniques for assessing this relationship, such as through independent observer-reports, may serve to a be a more equitable methodological approach.

Research in Autism Populations. Only four studies have looked at therapeutic alliance between child and therapist in therapy for children with autism, two of which were unpublished theses. The first of these unpublished studies examined parents' perceptions of the therapeutic

alliance formed between their child and the child's therapist in a CBT trial targeting symptoms of obsessive-compulsive disorder in children with autism (Houlding, 2014). Based on a limited qualitative inquiry, results highlighted the importance of therapeutic alliance (specifically the child-therapist bond) for continued attendance, how specific therapist qualities (i.e., collaborating, being fun, giving praise, reducing frustration) and taking the time to work the child contributed to a strong alliance, and how resistance to the therapeutic experience can be indicative of the quality of the therapeutic relationship. However, this study does not inform on the association between therapeutic alliance in treatment outcomes for this population. The second unpublished manuscript examined differences in the quality of therapeutic alliance between children with and without autism, who had anxiety disorders, and evaluated whether therapeutic alliance predicted change in anxiety severity following cognitive behaviour therapy (Klebanoff, 2015). Findings from this study indicated that therapeutic alliance did not differ between children with and without autism when rated by children, but significantly differed when rated by the therapist. For the autism group, early-alliance, as reported by the child, was not associated with reduced anxiety, while therapist-reported alliance was, though the size of this effect is unclear. There are two notable limitations with this study: (1) therapeutic alliance was only consistently assessed between groups at the third therapy session, meaning that analyses were based on a single measure of alliance, at one phase of the therapy process, and (2) groups did not receive the same therapy program; children with autism received modified CBT, confounding any differences in the development and nature of therapeutic alliance between children with and without autism.

Preliminary evidence suggests that it is possible to establish therapeutic alliance with youth with autism, and that alliance in therapy for this population can be reliably measured using

an observational coding scheme. In a recent peer-reviewed study, researchers conducted a piloted randomized controlled trial (RCT) involving 36 adolescents with autism (Murphy et al., 2017). The study compared the efficacy of non-directive, supportive counselling, to a CBT program adapted for adolescents with autism, in reducing anxiety. The authors included the Therapy Process Observational Coding Scheme – Alliance Scale (TPOCS-A; McLeod & Weisz, 2005), an observational measure of alliance, as an index of treatment fidelity. Results indicated that, for both treatment conditions, independent observer ratings of therapeutic alliance were comparable to those given in previous therapy studies that involved youth without autism (McLeod & Weisz, 2005). A second recently published study examined the relation between therapeutic alliance and treatment response in cognitive behaviour therapy targeting anxiety, for 64 children aged 7-16 years with autism (Kerns et al., 2017). Therapeutic alliance was measured using the Therapeutic Alliance Rating Scale for Children – Revised (TASC-R; Shirk, Gudmundsen, Kaplinski & McMakin, 2008; Shirk & Saiz, 1992), which assesses child and therapist perceptions of task collaboration and client-therapist bond. Contrary to what has been found for children without autism (McLeod, 2011), child characteristics, including age, externalizing and internalizing symptoms, were not associated with therapeutic alliance. Autism symptom severity was also not related to ratings of alliance. In regard to treatment outcome, therapeutic alliance was significantly stronger for children who responded to the anxiety-targeting CBT program, compared to children who did not show treatment response, and was associated with reductions in clinician-rated anxiety and global severity ratings. However, there was no association between child-reported alliance, and symptom improvement; results were only significant for therapist-reported alliance, which may be a function of the temporal proximity between alliance and outcome data collection (McLeod, 2011).

There have been a number of recommended modifications to CBT for children with autism, which include use of visually salient materials, approaches that are simple, structured and concrete, involving parents the therapy process, and integrating the child's special interests into sessions (Moree & Davis, 2010; Reaven, 2009; Walters, Loades & Russell, 2016). Yet, there are no recommendations, or suggestions, around alliance-building behaviours that therapists can employ. Due to the nature of core symptoms, the ability to form meaningful interpersonal relationships may pose as a greater challenge for children with autism, compared to peers without autism. Therapists may need to modify their own behaviour, and customize therapy sessions in order to create a supportive therapeutic atmosphere (Koenig & Levine, 2011). A deeper understanding of how child pre-treatment characteristics and specific therapist skills enhance or abate the therapeutic relationship when working with children with autism can be used to inform clinicians in this field.

Current Study

The purpose of the current research was to examine the role of therapeutic alliance in CBT for children with autism determining (1) how pre-treatment child characteristics and therapist in-session skills influence the therapeutic alliance, and (2) if therapeutic alliance is a significant predictor of treatment outcomes for this population. This is among the first studies to explore predictors of therapeutic alliance, to consider therapeutic alliance as it relates to treatment outcome, and to focus on how therapist factors influence the treatment process in therapy for children with autism. Additionally, it is the first known study to evaluate the relation of therapeutic alliance with these variables using an objective, behavioural observation method that assesses therapeutic alliance at multiple points in the treatment process.

There is presently limited research on therapeutic alliance in treatments for children with autism. Thus, this study aimed to establish foundational knowledge on these process-related factors in therapy for this population. The following research questions and hypotheses were addressed and tested:

1. Do pre-treatment child characteristics, including emotional and behavioural functioning, emotion regulation, and readiness to participate in treatment predict the quality of therapeutic alliance in CBT for children with autism?

    a. Hypothesis: Child emotional and behavioural functioning, as reported by parent and clinician prior to be beginning treatment, will not be predictive of the quality of therapeutic alliance.

    b. Hypothesis: Child emotion regulation, as reported by parent and child prior to beginning treatment, will be related to the therapeutic alliance, with greater dysregulation being predictive of lower alliance ratings.

    c. Hypothesis: Child readiness to participate in treatment will positively predict the therapeutic alliance.

2. Do therapist skills applied early on in therapy influence the quality of therapeutic alliance in subsequent sessions?

    a. Hypothesis: Positive therapist behaviours (e.g., accommodating the child's special interests, promoting collaboration, and creating a fun, supportive therapeutic environment) will be predictive of a strong therapeutic alliance.

    b. Hypothesis: Therapist behaviours that push the child beyond their comfortable level of conversation, compromise trust established between therapist and child (such as through breaking promises) or exclude the child from the therapeutic

process (such as engaging in conversation with the parent while the child is present) are expected to predict a poorer therapeutic alliance.

3. Is therapeutic alliance a significant predictor of treatment outcomes?

    a. Hypothesis: Therapeutic alliance will predict a moderate portion of the variance in post-treatment child- and parent-reported emotion regulation, and parent- and clinician-reported emotional and behavioural functioning.

Methods

Participants

Participants included 48 children (91.7% male) between the ages of 8 and 12 years (M = 9.60, *SD* = 1.25) who took part in a randomized-controlled trial (RCT) evaluating an emotion-regulation focused cognitive behaviour therapy intervention (Weiss et al., 2018). Eligible participants met the following inclusion criteria: (a) were between 8 and 12 years of age; (b) demonstrated at least average intellectual functioning (IQ ≥ 79), based on the *Wechsler Abbreviated Scale of Intelligence – 2nd Edition* (*WASI-II*; Wechsler, 2011) two-subtest Full-Scale IQ (FSIQ-2; vocabulary and matrix reasoning); (c) exhibited some degree of readiness (i.e., motivation and willingness) to participate in therapy, as indicated by responses on three questions during screening ("How much do you want to be part of the program, "How much do you want to change," and "How hard you are willing to work?" rated on 8-point Likert scale, ranging from 0 = "Not at all" to 8 = "Very, very much"); (d) written documentation of an autism diagnosis from a qualified healthcare professional was provided by parents; and (e) recommended cut-offs on either the parent-report versions of the *Social Communication Questionnaire* (*SCQ*; Rutter & Bailey, 2003) or the *Social Responsiveness Scale – 2nd Edition* (*SRS-2*, Constantino, 2012) were met (this included a score above 12, and T-score within or

above mild range, respectively). For children whose parent could not provide documentation and did not meet cut off scores for either screening tool ($n = 2$), the *Autism Diagnostic Observation Schedule – 2nd Edition* (*ADOS-2*; Lord et al., 2012) Module 3 was administered to confirm diagnosis.

Children were not eligible to participate in the study if (a) they had previously been diagnosed with an intellectual disability or fell below the FSIQ-2 cut-off described above; (b) had a recent history of aggressive behaviour towards others, or self-injurious behaviours that could potentially be a serious safety concern; and/or (c) the child was currently receiving cognitive behaviour therapy, therapy targeting emotion regulation, or some other intervention that may overlap with the intervention being provided through the trial. Thirty-two children were excluded for not meeting inclusion criteria, and 11 declined to participate despite being eligible.

Sixty-eight children were eligible to participate in the larger RCT. Of these 68 children, 13 withdrew from the study after confirming enrollment. This included nine children who dropped out before beginning the intervention program, and four children who dropped out part way through the program. As a result, post-treatment data could not be collected for these participants. Data were not available for an additional six children because parents did not consent to having session videos used for research purposes ($n = 4$) or technical issues caused session videos to be unusable ($n = 2$). Lastly, data for one participant was excluded due to a change in therapist midway through treatment. Therefore, the final sample of $n = 48$ was included in analyses.

Measures

    Therapeutic Alliance. Therapeutic alliance and alliance building behaviours were measured using two observer-ratings: (1) the *Therapy Process Observational Coding System –*

Alliance Scale (*TPOCS*-A; McLeod & Weisz, 2005), and (2) the *Therapist Alliance-Building Behavior Scale* (*TABBS*; Creed & Kendall, 2005). Samples of coding schemes are provided in Appendix A.

The TPOCS-A is a nine-item observational measure, evaluating two facets of the therapeutic alliance: the therapeutic bond between therapist and client (*Bond*; six items), and compliance and collaboration on therapeutic tasks (*Task-Collaboration*; three items). Items are rated by an independent observer on a 6-point Likert scale (0 = Not at all; 5 = Great deal), indicating the extent to which client or therapist demonstrate given behaviours in session. The TPOCS-A was not developed based on any theoretical framework in particular, but instead used a comprehensive approach that considered therapeutic alliance in the context of child therapy, and incorporated items from several validated, successful measures of therapeutic alliance (Elvins & Green, 2008). Psychometric properties of the measure were evaluated using a small sample of children, aged 8 to 14 years, from outpatient community mental health clinics who received treatment as usual for internalizing problems. The TPOCS-A demonstrated acceptable interrater reliability (intraclass correlation coefficient $\geq .40$) for all nine items, and excellent internal consistency ($\alpha = .95$). The measure also showed convergent validity with child self-reported measures of alliance (McLeod & Weisz, 2005; McLeod et al., 2017). The TPOCS-A has since been used in other studies of alliance in both individual and group CBT for children with internalizing problems, which have also shown acceptable reliability of the measure (Chiu, McLeod, Har & Wood, 2009; Liber et al., 2010). For each session within the current study, internal consistency of the nine items ranged from $\alpha = 0.45$ to 0.83.

The TABBS aims to measure therapist behaviours believed to contribute to therapeutic alliance. The assessment tool was developed by observing previous CBT sessions, and

identifying behaviours that map onto Bordin's three-armed conceptualization of therapeutic alliance (i.e., bond, goals, and task). Through observational coding, seven positive-valence therapist behaviours (e.g., customizing the session), and four negative-valence therapist behaviours (e.g., pushing the child to talk) are rated on 4-point scale (0 = absent, or present below a typical level; 3 = strong, or present far above a typical level). In the original application of the TABBS (Creed & Kendall, 2005), interrater reliability was excellent overall (ICC = .91), and adequate construct validity. The authors opted to exclude two items (i.e., customizing the session; inappropriate talk) from analyses because of poor reliability. However, because of the nature of the therapy program (i.e., parents included in session), and characteristics behaviours of autism (i.e., intense special interests) these items were included for the current study.

Pre and Post-Treatment Measures. Pre and post-treatment measures included child self- and parent-reports of emotion regulation, and parent- and clinician-report of child behavioural and emotional functioning.

Children's Emotion Management Scales (CEMS). Child self-reported emotion regulation was measured using the CEMS (Zeman, Cassano, Suveg & Shipman, 2010), for which the child is asked to rate how frequently they exhibit certain regulatory behaviours during different emotional states on a 3-point scale (1 = Hardly ever; 3 = Often). The CEMS includes three separate scales assessing self-regulation during feelings of Sadness (12 items), Anger (11 items), and Worry (10 items), which are further divided into three subscales: Inhibition (e.g., "I hide my sadness."), Dysregulation (e.g., "I do things like slam doors when I am mad."), and Coping (e.g., "I talk to someone until I feel better when I'm worried."). A research team member assisted the child in completing these measures by reading each statement aloud and ensuring the child understood each item before providing their response. Children could independently circle

their response, indicate their response orally to the research team member, or point to their response on a handout that had each of the three response options printed on it. The CEMS has demonstrated convergent and divergent validity (Zeman et al., 2010), and acceptable to good internal consistency for this sample.

      Emotion Regulation Checklist (ERC). The ERC (Shields & Cicchetti, 1997) is a 24-item parent-report measure, assessing the processes related to emotion regulation. The ERC includes two subscales: Lability/Negativity (15 items), measuring mood swings, reactivity, emotional intensity, and dysregulated emotions (e.g., "Is prone to disruptive outbursts of energy and exuberance."), with higher scores indicating greater dysregulation, and Emotion Regulation (8 items; Note: one item was not included in either scale), measuring adaptive regulation processes (e.g., "Responds positively to neutral or friendly overtures by adults."), with higher scores indicating better emotion regulation (Shields & Cicchetti, 1998). Responses are provided using a 4-point scale (1 = Never, 4 = Almost always). The ERC has shown to have good to excellent internal consistency (Shields & Cicchetti 1997; 1998), and acceptable to good internal consistency for the current study.

      Emotion Regulation and Social Skills Questionnaire (ERSSQ). The ERSSQ (Beaumont & Sofronoff, 2008) is a 27-item parent report measure, designed specifically to assess emotion regulation and social skills for children with autism. Parents provide responses on a 5-point scale (0 = Never, 4 = Always), indicating how frequently their child displays certain skills or behaviours, which are summed to yield a single total score. A recent validation study of the ERSSQ found that the measure exhibited excellent internal consistency ($\alpha = .90$) and concurrent validity (Butterworth et al., 2014). Internal consistency for the current sample was good.

Behavioral Assessment System for Children – 2nd Edition, Parent Rating Scale

(BASC-2 PRS). The BASC-2 PRS (Reynolds & Kamphaus, 2004) assesses both behavioural and emotional problem behaviours and adaptive functioning. For children between 8 – 11 years of age, parents completed the PRS-Child form (160 items), while parents of children who were 12 years of age completed the PRS-Adolescent form (150 items), which yield comparable subscales. Parents are asked to rate items on a 4-point scale (0 = Never, 3 = Almost always), which are summed and converted to subscale *T-scores*. Subscales included in the current study were the four composite scores: Externalizing Problems, Internalizing Problems, Behavioral Symptoms Index, and Adaptive Skills. The BASC-2 has demonstrated strong internal consistency and concurrent validity with other child behaviour rating scales (Reynolds & Kamphaus, 2004), and has been used as an assessment tool in a number of studies that have included children with autism (Grondhuis & Aman, 2012; Volker et al., 2010).

Anxiety Disorder Interview Schedule – Parent Version (ADIS-P). The ADIS-P (Silverman & Albano, 2004) is a semi-structured interview that provides a comprehensive assessment of both internalizing and externalizing disorders, and common comorbidities such as school refusal, enuresis and sleep terrors, based on diagnostic criteria of the *Diagnostic and Statistical Manuals of Disorders, 4th Edition* (*DSM-IV*, American Psychiatric Association 1994). Parents provide information regarding symptomology, age of onset, and degree of interference in daily life for each disorder. The interviewer then provides a severity rating ranging from 0 to 8 for each disorder the child met criteria for, as well as an overall rating of clinical severity. The ADIS-P is recognized as the most commonly used outcome measure in CBT trials for children with autism (Sung et al., 2011; Walters et al., 2016).

Clinical Global Impression Scale – Severity (CGI-S). The CGI-S (Guy, 1976) provide clinician ratings of clinical severity, and improvement following treatment completion. For the current study, the clinician providing impression scores was given de-identified copies of the ADIS-P clinical summary page, and the BASC-2 profile report from pre-treatment and post-treatment assessments. CGI-S ratings ranging from 0 (no illness) to 6 (serious illness) were given for each assessment point. The CGI has also been used in previous CBT trials for children with autism (Wood et al., 2009)

Procedures

The larger randomized controlled trial from which this study was derived began in September 2013. This research has received ethics review and approval by the York University's Ethics Review Board.

Study ads were delivered via web postings and e-newsletters from local autism advocacy websites. Information about the study was also passed along by past participants, and healthcare and social service providers in the Greater Toronto Area. Families who were interested in participating were asked to contact the study coordinator to begin the screening process.

The screening process involved an initial telephone interview with a member of the research team, at which point the parent was provided with details regarding the study process, and answered a short series of questions regarding their child's diagnosis, and emotional and behavioural concerns. Parents were then directed to complete an online survey, which included the SCQ and SRS-2. If initial inclusion criteria were met, the parent and child were invited to attend an in-person screening assessment. During this assessment, parents provided informed consent, and children provided either written or verbal informed assent. A member of the research team then administered the WASI-II – FSIQ-2, as well as a brief questionnaire

assessing the child's readiness to receive help and take part in the therapy program. Simultaneously, but separately, a second research team member administered the ADIS-P to assess for emotional and behavioural disorders that were present for the child, prior to starting therapy.

Families that were eligible to participate and were still interested in participating returned for a baseline assessment, at which point parents and children completed outcome measures to determine pre-treatment levels of functioning. Following this appointment, families were randomly allocated to either a treatment immediately (TI) condition (i.e., begin therapy within one week following baseline assessment), or to a waitlist (WL) control condition (i.e., wait approximately 12 weeks, complete a second assessment, then begin therapy) as part of the larger randomized-controlled trial. Outcome measures were re-administered for a second-time following treatment completion, or the waitlist period, and then re-administered a third time at a 10-week follow-up for children in the TI condition, and at post-treatment for children in the WL condition. For the purposes of the current study, children in either condition, who completed the therapy intervention in its entirety will be combined to form one treatment group.

Intervention. The *Secret Agent Society: Operation Regulation* (*SAS:OR*; Beaumont, 2013) is a manualized cognitive behaviour therapy program targeting emotion regulation, adapted for children with autism. The program includes ten individual therapy sessions that the therapist, child, and primary caregiver attend. There is an additional option to include the child's school teacher in the intervention, which is encouraged to promote generalization of skills beyond the therapy and home environments. Each session focuses on a particular aspect of emotion regulation, and involves a combination of psychoeducation, skill application through computer games and in vivo practice, mindfulness exercises, gradual exposure to increasingly

challenging situations, check-ins and planning around the home-school component, and session rewards. Children and parents are each provided with handbooks, along with other visually-salient materials to support practice outside of sessions. Parents are also provided with tip sheets to pass along to the child's teacher, and a home-school diary to reinforce skill practice during the week. The overall length of program involvement for participants who completed all sessions was approximately 11 weeks (M = 75 days, SD = 15.77, Range: 61 to 154 days), and sessions included in study coding ranged in time from 41 to 102 minutes (Session 2: M = 60.95, SD = 9.62; Session 3: M = 70.50, SD = 10.07; Session 4: M = 65.11, SD = 13.68; Session 7: M = 59.75; SD = 9.68; Session 8: M = 69.74, SD = 11.97; Session 9: M = 69.84, SD = 11.94).

Over the course of the study of trial, SAS:OR was provided by three post-doctoral fellows and 19 trained graduate students (Master level, n = 10; Doctoral level, n = 9) enrolled in clinical or clinical-developmental psychology programs, under the supervision of a registered clinical psychologist. Therapists were between 23 and 33 years of age (M = 26.95, SD = 3.05), were predominantly female (90.9%), and varied in the amount of previous experience they had working with children with autism in a clinical setting (M = 3.05 years, SD = 3.33, Range: 0 to 11 years). Therapists received one full-day training on session content, familiarized themselves with facilitator, child and parent manuals for each session, and reviewed videos recordings of previous therapy sessions as models of in-session application. Therapists also participated in mock therapy sessions to ensure therapist readiness prior to beginning with a family. Following each session, therapists completed a procedural integrity checklist, and received weekly supervision in order to maintain treatment fidelity and address any issues that may have arisen in session. Analysis indicated that treatment integrity across sessions was acceptable (85% ± 11%, Range: 50 – 100%; Weiss et al., 2018).

Coding. Coders included myself, along with two research assistants. Training for the TPOCS-A followed procedures outlined by McLeod and Weisz (2005). Training included in-depth review of the original article describing test development and scoring manual, coding practice sessions, and weekly check-ins to discuss any discrepancies or issues that arose during practice coding. Because the TABBS was coded in tandem with the TPOCS-A, training for this measure followed the same procedure. Coders were trained over a one-month period and reached excellent reliability (TPOCS-A, ICC = .92; TABBS, ICC = .90; Cicchetti, 1994). Sampling of therapy sessions for study coding mimicked methods employed by previous research examining early and late phases of therapy for children (Chiu et al., 2008; McLeod & Weisz, 2005). As well, in line with previous evidence suggesting a significant effect of time of measurement (Shirk & Karver, 2003), early and late alliance were explored separately, as a single aggregate score may mask the dynamic nature of the relationship (Horvath & Symonds, 1991). Once reliability among raters was established, sessions were randomly assigned to coders. The coding team met regularly to discuss results of reliability analysis to avoid rater drift. Due to the extent of their involvement in the larger randomized-controlled trial, and the content included in each session, coders could not be completely blind to treatment outcome or session number.

Therapeutic alliance and therapist behaviours were coded for sessions 2 and 3 (early alliance/behaviours), and sessions 8 and 9 (late alliance/behaviours). These ratings were then averaged to produce an early and late alliance score (Chiu et al., 2008), and early and late scores for each of the therapist behaviours measured using the TABBS (Creed & Kendall, 2005). If video recordings were not available (e.g., technical issues with recording equipment), subsequent sessions for early alliance (i.e., session 4) and previous sessions for late alliance (i.e., session 7) were coded. This was the case for nine early sessions (session 2, $n = 5$; session 3, $n = 4$), and

eight late sessions (session 8, $n = 5$; session 9, $n = 3$). Kruskal-Wallis analyses confirmed that ratings on TPOCS-A and TABBS items did not significantly differ between cases where session 4 and 7 were coded as alternates to sessions 2, 3, 8 or 9.

Interrater reliability statistics for the TPOCS-A and TABBS were then calculated using intraclass correlation coefficients (ICCs) for approximately 30% of available sessions ($n = 60$). Reliability coefficients were based on the one-way random effects ICC (1, 1) model (Shrout & Fleiss, 1979). This form of ICC is a reliability estimate of each individual observer's rating, allowing for the generalization of results to other single observers, as discussed by Shrout and Fleiss (1979). The overall interrater reliability for TPOCS-A and TABBS was excellent (ICC = .95, $p < .001$ and .89, $p < .001$, respectively). Interrater reliability for individual items were all within acceptable range (ICC $\geq$ .40, Cicchetti, 1994), with ICC ranging from .76, $p < .001$ ("To what extent does the client demonstrate positive affect toward the therapist") to .96, $p < .001$ ("To what extent did the client use therapeutic tasks to make changes outside the session") for TPOCS-A items, and from .54, $p < .01$ (Collaboration) to .87, $p < .001$ (Validation) for TABBS items.

Analysis Plan

All analyses were conducted using IBM SPSS Statistics version 24. Prior to evaluating the main research questions, demographic and clinical characteristics were examined to determine distributions of scores, and internal consistency of predictor and outcome measures. Predictor variables for each research question were selected based on evidence from previous research with children without autism (Shirk & Karver, 2011), the clinical relevance of the variable, or results from preliminary analyses examining correlations between predictors and outcomes. Since TPOCS-A and TABBS items were rated using an ordinal scale, and score

distributions tended to be either positively or negatively skewed, Spearman rho correlations were calculated to evaluate associations among variables.

A series of multiple regressions were calculated to determine if pre-treatment child characteristics predicted therapeutic alliance (Hypotheses 1a-c). Spearman-rho correlations were first calculated to measure bivariate associations among pre-treatment characteristics (i.e., child treatment readiness scores, CEM Inhibition, Dysregulation and Coping, ERC Lability/Negativity and Emotion Regulation, BASC-2 Externalizing, Internalizing, BSI and Adaptive Skills, ADIS-P overall severity, CGI severity), and early and late-session TPOCS-A Bond and Task Collaboration. Multicollinearity of predictors was considered by examining correlations among pre-treatment characteristics (Table 4). If predictor variables were largely correlated (i.e., $r >$ .50,), only the variable with the strongest association with Bond and Task-Collaboration was included in the model. Selecting out predictors also ensured enough statistical power was maintained to detect moderate to large effects. Subsequently, pre-treatment characteristics, as well as relevant child demographic variables, were entered simultaneously as predictors into each model. Early and late-session TPOCS-A ratings of Bond and Task-Collaboration were included as outcome variables in separate analyses.

Methods employed by Creed and Kendall (2005) were used to determine if therapist skills applied early in therapy influenced the quality of therapeutic alliance in subsequent sessions (Hypotheses 2a-b). Each TABBS item was averaged across the two early sessions, and then simultaneously entered into two separate regression models predicting TPOCS-A ratings of Bond and Task-Collaboration, independently.

A series of hierarchical regression analyses were conducted to assess therapeutic alliance as a predictor of treatment outcome (Hypothesis 3). Days in treatment and pre-treatment scores

were entered in a first step to control for effects of time and baseline levels of outcome measures, respectively (McLeod & Weisz, 2005). The second block consisted of either entering early or late TPOCS-A Bond and Task-Collaboration scores. Change in R^2 was calculated to determine additional variance accounted for in treatment outcome by either the early or late therapeutic alliance scores, after controlling for time and baseline scores. These analyses were conducted such that each treatment outcome was individually considered as the outcome variable.

It is recognized that failing to correct for multiple comparisons inflates the rate of Type-1 error (i.e., identifying "false-positives"). However, given the small sample size, limited research in the area, and the interest in balancing the examination of significance in terms of the probability of identifying a true effect, as well as effect size, no adjustments were made (Feise, 2002). In order to balance the likelihood of Type 1 and Type 2 error (i.e., identifying "false negative") occurring, statistical significance was consistently evaluated at the alpha $< .05$ level. Power analyses using G*Power 3.1 indicated that moderate to large effects could be detected using multiple linear regression analyses with a sample of 48 children, depending on the number of predictors included.

Results

Preliminary Analyses

The means, standard deviations, and range of scores for pre-treatment child characteristics and demographic information, TABBS items and TPOCS-A scales are provided in Tables 1 and 2. Following the logic presented by Creed and Kendall (2005), the decision was also made to exclude item 10 of the TABBS (i.e., not following through on promises) in subsequent analyses, because ratings higher than 0 rarely occurred ($n = 5$ of 195 sessions).

TPOCS-A scores were significantly associated within and across time periods (all p < .001).

Early Bond was related to early Task-Collaboration, $r_s(48) = .71$, late Bond, $r_s(48) = .64$, and late Task-Collaboration, $r_s(48) = .55$. Early Task-Collaboration was also associated with late Bond, $r_s(48) = .49$, and late Task-Collaboration, $r_s(48) = .60$. Finally, late Bond was significantly related to late Task-Collaboration, $r_s(48) = .61$.

Mann-Whitney U tests and correlations were conducted to confirm if child demographic factors were related to TPOCS-A scores. Ratings of Bond and Task-Collaboration scores on the TPOCS-A did not differ based on child gender or ethnicity. Child age was not associated with early or late Bond, $r_s(48) = -.15$, $p = .31$ and $r_s(48) = -.04$, $p = .78$ (respectively), or early or late Task-Collaboration, $r_s(48) = .16$, $p = .29$ and $r_s(48) = .04$, $p = .76$ (respectively). Child IQ was also not related to early Bond, $r_s(46) = .20$, $p = .18$, or Task-Collaboration, $r_s(46) = .07$, $p = .66$, but was related to late Task-Collaboration, $r_s(46) = .34$, $p = .02$, and had a nearly significant relation with late Bond, $r_s(46) = .29$, $p = .05$. IQ was therefore entered into all regression models that examined child-relevant factors.

Pre-Treatment Child Characteristics and Therapeutic Alliance

Several pre-treatment child characteristics were significantly associated with TPOCS-A ratings, both early and late in treatment (see Table 3). Early and late Bond were both positively associated with CEM Inhibition. Early-session Task-Collaboration was positively related to scores on CEM Coping and ERSSQ, and negatively associated with CEM Dysregulation. Late-session Task-Collaboration was positively associated with CEM Inhibition and ERSSQ, and negatively related to CEM Dysregulation, ERC Lability/Negativity, BASC-2 Externalizing and BSI, ADIS-P Overall Severity, and CGI Severity.

A series of linear regressions were used to determine the variance in early-session and late-session Bond and Task-Collaboration that could be accounted for by child pre-treatment characteristics. In support of hypothesis 1a, but contrary to hypotheses 1b-c, child pre-treatment characteristics did not account for a significant portion of the variance in early-session TPOCS-A Bond or Task-Collaboration, or late-session TPOCS-A Bond, and no unique predictors emerged, as shown in Table 4. Child pre-treatment characteristics significantly accounted for a moderate portion of the variance in late TPOCS-A Task-Collaboration, $R^2 = .40$, $F(7, 34) = 3.20$, $p = .01$, however there were no significant unique predictors within the model.

Therapist Behaviours and Therapeutic Alliance

As shown in Table 5, several early TABBS ratings were positively associated with late Bond, including the extent to which the therapist was playful, $r_s(48) = .31$, $p = .03$, was collaborative, $r_s(48) = .28$, $p = .05$, and found common ground, $r_s(48) = .36$, $p = .01$, while pushing the child to talk was negatively related to late Bond, $r_s(48) = -.31$, $p = .03$. Pushing the child to talk was the only early-session therapist behaviour related to late-session Task-Collaboration, $r_s(48) = -.40$, $p < .01$.

Two linear regression analyses were conducted to determine if early therapist behaviours were predictive of therapeutic bond and task collaboration later in therapy. Early-session TABBS items were entered into each regression model, with late-session TPOCS-A Bond and Task-Collaboration as separate outcome variables. To avoid multicollinearity and maximize statistical power, item 5 of the TABBS was excluded as a predictor because it was highly correlated with other TABBS items (i.e., $r > .50$), and had the weakest association with Bond and Task-Collaboration. As shown in Table 6, the overall model predicting late TPOCS-A Bond was not significant, $R^2 = .27$, $F(9, 38) = 1.57$, $p = .16$, and no TABBS items emerged as unique

predictors. The overall model did account for a moderate portion of variance in TPOCS-A Task-Collaboration, $R^2 = .35$, $F(9, 38) = 2.29$, $p = .04$, with 'Pushing the child to talk' emerging as a significant unique predictor ($\beta = -0.35$, $p = .02$), accounting for 14% of the variance.

Therapeutic Alliance and Treatment Outcome

In order to assess the association among therapeutic alliance and treatment outcome, partial correlations between early and late TPOCS-A scores, and treatment outcome were computed, controlling for baseline level of the outcome variable and child IQ. Results indicate early TPOCS-A Bond and Task-Collaboration, and late TPOCS-A Bond, were not associated with treatment change for any outcome variables. Late TPOCS-A Task-Collaboration was related to decreased ERC Lability/Negativity, $r(39) = -.39$, $p = .01$, and increased BASC Adaptive Skills, $r(39) = .36$, $p = .02$, post-treatment. Late TPOCS-A Task Collaboration was not related to changes in CEM Inhibition, ERC Emotion Regulation, ERSSQ, ADIS-P or CGI scores following treatment.

A series of hierarchical linear regressions were subsequently conducted to determine if therapeutic alliance variables were predictors of treatment outcomes, detailed in Table 7. After controlling for time in treatment, baseline scores, and child IQ, early Bond and Task-Collaboration were not predictive of treatment change for any outcome variables. Late ratings of therapeutic alliance accounted for a significant portion of variance in treatment change in ERC Lability/Negativity, $\Delta R^2 = .07$, $p = .02$, and BASC-2 Externalizing, $\Delta R^2 = .04$, $p = .02$. Specifically, late TPOCS-A Task-Collaboration emerged as a unique predictor of post-treatment CEM Dysregulation ($\beta = -0.45$, $p = .04$), ERC Lability/Negativity ($\beta = -0.36$,$p = .02$) and BASC-2 Externalizing ($\beta = -0.27$, $p = .01$). Late TPOCS-A Bond was a significant predictor of increased BASC-2 Externalizing scores post-treatment ($\beta = 0.19$, $p = .04$). Given the unexpected

direction of relation between these variables, additional examination was done to determine if there was a suppression effect of the regression model. Both partial correlations and subsequent analysis that only included late TPOCS-A Bond did not indicate any significant relation in the positive direction. Late therapeutic alliance ratings were not predictive of change in CEM Inhibition, ERC Emotion Regulation, ERSSQ, BASC-2 Internalizing and BSI, ADIS-P Overall Severity or CGI Severity scores.

Discussion

The current study examined the role of therapeutic alliance in CBT for children with autism, by evaluating a) the contribution of pre-treatment child characteristics to the quality of alliance, b) how therapist skills early in treatment predict the quality of alliance in later sessions, and c) whether early and late the therapeutic alliance is associated with change in child emotion regulation and psychopathology.

Pre-Treatment Child Characteristics and Therapeutic Alliance

As expected, child psychopathology was not associated with early therapeutic alliance (either task or bond), or late-session ratings of therapeutic bond. However, parent-reported behavioural symptoms, and clinician-reported symptom severity at baseline were related to poorer task-collaboration in later sessions. In the single study that examined the association between pre-treatment characteristics and therapeutic alliance for children with autism (Kerns et al., 2017), demographic factors and pre-treatment clinical levels of internalizing and externalizing symptoms, and anxiety severity were not related to child, parent, or therapist ratings of the alliance. Demographic factors, including age, gender and ethnicity were also not associated with ratings of therapeutic alliance in the present study. Discrepancies between the two study results may be due to source of reporting and timing of reporting, which are known to

influence the magnitude of effect when considering treatment outcome (McLeod, 2011; McLeod et al., 2017). As well, Kerns et al. (2017) did not consider intellectual functioning as a pre-treatment characteristic, which, in the current study, was related to task-collaboration and had a trending association with therapeutic bond in later sessions. Given the heterogeneity in intellectual functioning for children with autism, future research should continue to examine the importance of intellectual ability in CBT, as it relates to task-collaboration. Additionally, therapists should be considering the intellectual ability of the child throughout treatment to ensure that session tasks are modified to be digestible and allow the child to actively participate.

Consistent with the initial hypothesis, emotion regulation was significantly related to the quality of therapeutic alliance throughout treatment. In particular, child self-reported tendencies to inhibit emotional responses were associated with a stronger therapeutic bond and better task collaboration both early and late in treatment. These results suggest that in the context of therapy, emotional inhibition may benefit the treatment process, in contrast to the negative effects that suppressing one's emotions may have in day-to-day life (Aldao, Nolen-Hoeksema & Schweizer, 2010). In comparison to common overt emotional dysregulation that require significant management of behaviours from parents and individuals working with children with autism (Mazefsky, 2011), inhibiting emotional experiences may allow for therapists to more easily establish rapport. The current study also found that children with better coping skills, emotion regulation and social skills, and less emotion dysregulation had better task-collaboration with their therapist in early sessions. As well, less emotion dysregulation and emotional lability, and greater emotional inhibition and emotion regulation-related social skills were associated with better task-collaboration in later sessions. This was the first study to examine the association between emotion regulation prior to beginning treatment and the quality of therapeutic alliance

with children with autism. Given the relation between emotion regulation and psychopathology, as well as the challenge many children with autism experience around emotion regulation (Mazefsky & White, 2014), future research could continue to explore how these processes influence therapeutic mechanisms of change over time.

Contrary to expectations, child readiness to participate in therapy was not significantly related to the quality of therapeutic alliance, though there was a trend towards a link with early task-collaboration. Although children vary in their degree of readiness to participate, treatment was sought about the child's primary caregiver, and in this context, children may fail to recognize personal emotional and behavioural challenges (Shirk & Russell, 1998, as cited in Shirk & Karver, 2003), which may compromise the validity of self-reported readiness. From a process and developmental perspective, this lack of insight may serve as a unique challenge when trying to establish therapeutic alliance with younger clients (Shirk & Karver, 2003). Child pre-treatment characteristics did not predict either aspect of the therapeutic alliance early in treatment, or the therapeutic bond later in treatment, when entered into regressions. Further, only a moderate portion of variance of late task-collaboration was accounted for by the pre-treatment characteristic regression model, with no significant unique predictors. Greater intellectual functioning and emotional inhibition were on trend as predictors of better task-collaboration, while greater child-reported emotion dysregulation and clinician-rated symptom severity were on trend as predictors of poorer task-collaboration. This lack of significant univariate patterns may be a result of the low power to account for small to moderate effects in models where the predictor variables, though not at the level of multicollinearity, continue to show correlations with each other. Future research should continue to examine how pre-

treatment child characteristics influence the quality of therapeutic alliance using larger samples to substantiate true small to moderate effects.

Therapist Behaviours and Therapeutic Alliance

This study is believed to be the first to directly observe the therapist behaviours that are applied in session during CBT for children with autism and to attempt to understand how these behaviours relate to therapeutic alliance. Although research has amassed around the importance of the therapeutic alliance, there is little understanding of what specific behaviours contribute to this relationship. Even less is known about how therapists can and should modify their behaviours to form this relationship with clients who have core challenges in social domains of functioning. Creed and Kendall (2005) developed a list of behaviours thought to be key aspects of the therapeutic alliance in order to assess this association in CBT for children with anxiety disorders. In the context of therapy for children with autism (i.e., the current study), playfulness, initiating collaboration, and finding common ground with the child in early sessions were positively associated with the therapeutic bond in later sessions, while pushing the child to talk had a negative relation with bond and with task-collaboration. Developing a collaborative effort between therapist and client is an important aspect of CBT for children, as it reduces reliance on the therapist as the sole "expert" and simultaneously encourages active involvement from the child in their own treatment (Scarpa & Lorenzi, 2013). Therapists who make greater attempts to collaborate with the child likely strengthen the therapeutic bond by promoting the child's self-efficacy and creating an environment in which the child feels valued. While important for all children, playfulness may be relevant in forming bonds with children with autism as they may overlook meanings of sincerity within more subtle gesture compared to children without autism, making more overt signals useful. Finally, finding commonalities in autism indicates an ability to

join with children on their particular interests or mindset, working with rigid or idiosyncratic ways of thinking rather than trying to have children convinced or otherwise told to think differently. Many authors have suggested that CBT can and should be modified for children with autism, including adaptations to therapist behaviours to bolster a collaborative relationship (Attwood & Scarpa, 2013; Danial & Wood, 2013; Donoghue, Stallard & Kucia, 2011; Moree & Davis, 2010). For example, creatively (but reasonably) incorporating the child's interests into session materials, and using developmentally appropriate humour can be helpful in enhancing the therapeutic experience and promoting a therapeutic bond between therapist and child. Explicitly outlining the roles and expectations of each person and clearly defining session goals through (e.g., through a visual schedule) may also help to strengthen collaboration (Donoghue et al., 2011). Conversely, pushing the child to discuss their emotional challenges beyond the point of comfort or interest may give the impression that the therapist's agenda is of greater priority than the child's needs (Chu, Suveg, Creed & Kendall, 2010; Creed & Kendall, 2005). This may subsequently create a struggle between therapist and client around how session time is spent, and ultimately detract from, or rupture, the therapeutic bond and collaborative effort made by child and therapist. Additionally, these bivariate analyses did not emerge in comprehensive regression models where all behaviours were entered in simultaneously (except for pushing the child to talk). This may be due to entering nine nonorthogonal predictor variables into the model, potentially diminishing any unique predictive ability of the model.

There are a number of caveats to understanding how these therapist behaviours may be associated with therapeutic alliance for children with autism. This study sought to identify a temporal link between therapist behaviours and the subsequent quality of the therapeutic relationship as a first step in understanding this connection; not necessarily to determine if early

behaviours *lead* to alliance or to a change in the quality of alliance during the treatment process (i.e., causal relation). Although a temporal association does not determine the directionality of this relation, it illustrates the relevant connection between what occurs early in therapy and what occurs later on. In order to elucidate a causal mechanism between therapist behaviours and the quality of alliance, future research could attempt to control for early ratings of alliance and later therapist behaviours, or experimentally manipulate therapist behaviours.

Therapeutic Alliance and Treatment Outcome

Contrary to hypotheses, early therapeutic alliance was not significantly associated with treatment outcomes in CBT for children with autism. Early ratings of bond and task-collaboration were not predictive of improvements in child or parent-reported emotion regulation, or parent or clinician-reported emotional and behavioural functioning, following therapy. Of interest, some degree of late therapeutic alliance was associated with child change in therapy. Univariate analyses indicate that task-collaboration was associated with improvements in child emotion dysregulation and externalizing symptoms. These findings align with those from studies involving children without autism, where alliance-outcome effect sizes tend to be greater when considering changes in externalizing problems compared to internalizing problems (McLeod, 2011). It has been suggested there may be greater variability in alliance when working with children who have externalizing problems, which in turn results in larger correlation coefficients (Shirk & Karver, 2011). Although emotion regulation involves internalized processes (Mazefsky et al., 2013; Weiss et al., 2018), the current results reflect changes in emotion *dysregulation*; the child's negative externalized behavioural response. The measures of emotion regulation that were not significantly predicted by therapeutic alliance (e.g., ERSSQ; ERC Emotion Regulation subscale), focused more on the internalized or social aspects of

emotion regulation. Unexpectedly, results of the current study indicated that stronger therapeutic bond later in therapy was predictive of increased externalizing symptoms post-treatment. This result may be due to a suppression effect of including late task-collaboration in the regression model. When task-collaboration was not included as a predictor, late bond was no longer predictive of externalizing symptoms post-treatment, and essentially had no relationship with the outcome variable.

Previous research demonstrates stronger associations for late, versus early, measures of therapeutic alliance and treatment outcome in therapy for children and adolescents (Karver et al., 2006; McLeod, 2011; Shirk & Karver, 2011). The most recent meta-analysis of alliance in child and adolescent therapy found an average association of $r_w = 0.06$ for early alliance and treatment outcome, while the average correlation between late ratings of alliance and treatment outcome was $r_w = 0.34$ (McLeod, 2011). Research examining the capacity to predict treatment outcome from therapeutic alliance using different measurement time points has noted potential inflation of effect size for ratings of alliance taken later in the treatment process (i.e., assessing therapeutic alliance in the last third of treatment). Though ratings of later therapeutic alliance may be biased by symptom improvement when the reporter has been actively involved or invested in the treatment process (McLeod & Weisz, 2005; Shirk & Karver, 2011), the current study used third-party observational coding, which may have helped to reduce the perception of treatment progress as a confound. Autocorrelation as a result of close proximal time between the later sessions and post-treatment assessment may still inflate effect sizes.

Across analyses, it appears that the task-collaboration component of alliance is the more prominent aspect to focus on. In comparison to bond, task-collaboration was found to be a stronger predictor of treatment outcome, which simultaneously appears to be more heavily

influenced by characteristics relevant to the child prior to beginning treatment, as well as

therapist in-session behaviours. The collaboration between therapist and child during session

activities fits into the broader process-related factor of treatment adherence or engagement

(Meichenbaum & Turk, 1987), which is known to be a crucial aspect of making treatment gains.

Research in this area has largely focused on the role of parental engagement in treatment change

for child-focused therapies, with little exploration on the importance of active participation from

the child (King, Currie & Petersen, 2012). Given that the child is the primary client, addressing

challenges that may limit child engagement, such as lack of understanding around

generalizability of skills (e.g., failing to recognize how skills can be used to make friends or cope

with school stress) or low self-efficacy (e.g., feeling ill-equipped to master skills), both prior to

and throughout the treatment process seems necessary. Clinicians working with children would

undoubtedly benefit from skills training that specifically focuses on promoting and supporting

child engagement and collaboration in therapy.

Limitations

There are several limitations with the current study that should be taken into account. The

sample for the current study only included participants who completed treatment in its entirety,

and for whom post-treatment data were available. First, premature termination is recognized as

an important methodological issue for intervention research because of the impact it has on

generalizability of results, the introduction of sampling bias and, depending on sample size

available, reduction of statistical power (Nock & Ferriter, 2005). In fact, within each set of

analyses, numerous trending associations emerged, which may have potentially surpassed the set

alpha threshold if a slightly larger sample had been used. The small sample included in this study

ultimately limited the capacity to detect statistically significant associations, increasing Type II

error rates. Additionally, more sophisticated statistical methods that could account for therapist

variability and the nested design of the study (i.e., children nested within a therapist), such as

multilevel modeling, require a larger sample (Snijders, 2005), and could therefore not be applied.

Participants included in the current study were also predominantly Caucasian, and the large

majority of parents reported being married, having at least some post-secondary education, and

having a moderate to high family income. The limited diversity among participants barred

important consideration of demographic factors in relation the therapeutic alliance. To address

these limitations, future research should aim to replicate the current study using a larger, more

diverse sample, and assess variation in pre-treatment characteristics and therapeutic alliance data

that may be available for children who terminate treatment early. Second, coders could not be

completely blind to session number. Although session order was randomized in order to reduce

coding bias, the session content as well as the client or therapist mentioning the session number

at times, made it difficult for coders to be blinded to the session. Third, the measures of

therapeutic alliance included in this study (i.e., TPOCS-A; TABBS) were not developed with

children with autism in mind. For example, an indicator of therapeutic bond on the TPOCS-A is

the extent to which the child displays positive affect towards the therapist. Children with autism

commonly exhibit flattened affect or display a limited range of facial expression (Charlop,

Dennis, Carpenter & Greenberg, 2010), which is not necessarily indicative of lack of enjoyment

in the social interaction. This item may have therefore underestimated the quality of therapeutic

bond. Additionally, therapist behaviours not captured in the TABBS may be particularly

important for children with autism, such as the therapist's ability or willingness to work through

session content flexibly, to set up visual schedules to prepare the child for task transitions, or to

creatively incorporate a child's special interests into session materials, which are not necessarily

as crucial for children with other conditions. Before continuing to assess therapeutic alliance with individuals with autism as well as broader therapeutic processes, valid coding schemes based on empirical evidence and clinical expertise of this population should first be developed. Finally, this study was part of a larger efficacy trial that in part looked to evaluate therapist fidelity to a manualized treatment protocol. Though therapists can still deliver manual-based programs in a flexible manner to accommodate individual client needs (Kendall, Gosch, Furr & Sood, 2008), therapists may have felt pressured to abide by the therapy manual because of the focus of the larger trial, limiting the extent to which they tried to be flexible with treatment goals or therapeutic tasks. Future research may look to assess the quality of therapeutic alliance for children with autism who are receiving community-based services.

Conclusion

The therapeutic alliance is an important process factor to consider when providing therapy to children with autism. Although this study could not determine whether the quality of alliance differs from children without autism, it appears that this relationship can still develop and is relevant to the benefit for children with autism participating in CBT. Child pre-treatment characteristics, particularly intellectual functioning, emotion dysregulation and overall symptom severity, may influence aspects of therapeutic alliance; most notably the in-session task-collaboration between therapist and child. Therapist behaviours in early sessions may also influence the quality of task-collaboration later in the therapy process. Since task-collaboration in later sessions was identified as an important predictor of treatment change, addressing challenges related to engagement throughout the treatment process and applying therapeutic skills that foster a collaborative relationship is crucial for therapists working with children with autism.

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Table 1

Descriptive Statistics of Demographic and Pre-Treatment Characteristics (N = 48)

Measure	*M* or %	*SD*	Range	Cronbach's α
Child ethnicity[a]				
White/Caucasian	78.6%			
Visible minority	21.4%			
Parent marital status (married)[b]	91.5%			
Parent graduated from college[c]	90.7%			
Family income (CAD before taxes)[c]				
Less than $49,999	2.3%			
$50,000-$99,999	14.0%			
$100,000-$149,999	16.3%			
$150,000-$199,999	27.9%			
$200,000 or more	20.9%			
Prefer not to disclose	18.6%			
FSIQ-2	105.00	14.64	79-140	-
SRS-2	74.40	9.33	51-90	-
SCQ	21.62	4.45	14-30	-
Readiness to Participate	4.89	2.00	.33-8.00	-
CEM				
Inhibition	1.74	.47	1.00-3.00	.85
Dysregulation	1.73	.41	1.00-2.78	.71
Coping	1.96	.42	1.17-2.75	.82
ERC				
Lability/Negativity	2.43	.41	1.67-3.53	.80
Emotion Regulation	2.87	.49	1.88-4.00	.75
ERSSQ	1.81	.39	.89-2.70	.87
BASC-2				
Internalizing Problems	61.33	12.70	40-95	-
Externalizing Problems	58.06	10.47	41-86	-
BSI	69.25	10.05	53-95	-
Adaptive Skills	36.67	7.33	22-50	-
ADIS-P Overall Severity	4.04	1.66	0-7	-
CGI Severity	3.85	1.57	0-6	-

Note. ADIS-P = Anxiety Disorders Interview Schedule for DSM-IV - Parent Version; BASC-2 = Behavior Assessment for Children, 2nd Edition; BSI = Behavioral Symptoms Index; CEM =

Children's Emotion Management Scale; CGI = Clinical Global Impressions Scale; ERC = Emotion Regulation Checklist; ERSSQ = Emotion Regulation and Social Skills Questionnaire; FSIQ-2 = Wechsler Abbreviated Scale of Intelligence, Full-Scale IQ-2 Subscales; SCQ = Social Community Questionnaire – Lifetime Version; SRS-2 = Social Responsive Scale, 2nd Edition, Total T-Score.

[a]n = 42 (data not available for six participants)

[c]n = 47 (data not available for one participant)

[c]n = 43 (data not available for five participants)

Table 2

Descriptive Statistics of Therapeutic Alliance and Therapist Behaviours

Variable	Early Sessions			Late Sessions		
	Range	*M*	*SD*	Range	*M*	*SD*
TPOCS-A						
Bond	1.75-3.75	2.80	0.46	2.00-3.92	2.98	0.48
Task-Collaboration	1.17-5.00	4.04	0.76	1.83-5.00	3.99	0.69
TABBS						
Customizing the session	0.00-3.00	1.52	0.74	0.00-3.00	1.54	0.78
Being playful	0.00-2.50	1.18	0.65	0.00-2.50	1.15	0.67
Hope-encouragement	0.00-2.50	0.95	0.67	0.00-3.00	1.48	0.72
Collaboration	1.00-3.00	2.26	0.59	1.00-3.00	2.24	0.64
Validating	0.00-3.00	0.74	0.74	0.00-3.00	1.25	0.90
General conversation	0.00-2.00	0.67	0.58	0.00-2.50	0.75	0.67
Common ground	0.00-1.50	0.31	0.49	0.00-2.00	0.28	0.45
Pushing the child	0.00-1.00	0.09	0.27	0.00-2.00	0.20	0.40
Being too formal	0.00-2.50	0.48	0.73	0.00-1.50	0.39	0.49
Breaking promises	0.00-0.50	0.02	0.10	0.00-0.50	0.03	0.12
Inappropriate talk	0.00-2.00	0.32	0.51	0.00-1.00	0.19	0.28

Note. TABBS = Therapist Alliance-Building Behavior Scale; TPOCS-A = Therapist Process Observational Coding System – Alliance Scale.

Table 3

Spearman Rho Correlations Between Pre-Treatment Child Characteristics and TPOCS-A Ratings (N = 48)

| | Early TPOCS-A | | Late TPOCS-A | |
| | | Task- | | Task- |
Characteristic	Bond	Collaboration	Bond	Collaboration
FSIQ-2[a]	.20	.07	.29†	.34*
Readiness to Participate[a]	.17	.25†	.02	-.05
CEM[b]				
Inhibition	.30*	.27†	.36*	.30*
Dysregulation	-.24	-.38*	-.27†	-.32*
Coping	.09	.36*	.24	.28†
ERC				
Lability/Negativity	-.16	-.27†	-.07	-.39**
Emotion Regulation	.11	.17	-.02	.14
ERSSQ	.23	.31*	.06	.36*
BASC-2				
Externalizing Problems	-.12	-.22	-.14	-.37**
Internalizing Problems	.04	-.09	.05	-.26†
BSI	-.06	-.11	-.02	-.36*
Adaptive Skills	.14	.05	.05	.17
ADIS-P Overall Severity	-.17	-.14	-.04	-.30*
CGI Severity	-.12	-.20	-.02	-.35*

Note. ADIS-P = Anxiety Disorders Interview Schedule for DSM-IV - Parent Version; BASC-2 = Behavior Assessment for Children, 2nd Edition; BSI = Behavioral Symptoms Index; CEM = Children's Emotion Management Scale; CGI = Clinical Global Impressions Scale; ERC = Emotion Regulation Checklist; ERSSQ = Emotion Regulation and Social Skills Questionnaire; FSIQ-2 = Wechsler Abbreviated Scale of Intelligence, Full-Scale IQ-2 Subscales; TPOCS-A = Therapist Process Observational Coding System – Alliance Scale.
[a]$n = 47$. [b]$n = 45$.
** $p < .01$. * $p < .05$. † $p < .10$.

Table 4

Linear Regression Analysis for Pre-Treatment Child Characteristics Predicting Therapeutic Alliance

Variable	B	SE B	β
Early TPOCS-A Bond[a]			
FSIQ-2	<0.01	0.01	0.06
Readiness to Participate	0.03	0.04	0.13
CEM Inhibition	0.27	0.20	0.24
CEM Dysregulation	-0.19	0.19	-0.16
CEM Coping	-0.15	0.20	-0.13
ERSSQ	0.31	0.21	0.27
ADIS-P Overall Severity	0.01	0.05	0.04
Early TPOCS-A Task-Collaboration[a]			
FSIQ-2	<0.01	0.01	0.02
Readiness to Participate	0.08	0.06	0.23
CEM Inhibition	0.20	0.26	0.12
CEM Dysregulation	-0.39	0.26	-0.23
CEM Coping	0.13	0.27	0.08
ERSSQ	0.28	0.30	0.17
CGI Severity	-0.06	0.07	-0.14
Late TPOCS-A Bond[a]			
FSIQ-2	0.01	0.01	0.22
Readiness to Participate	-0.02	0.04	-0.06
CEM Inhibition	0.29	0.19	0.26
CEM Dysregulation	-0.21	0.19	-0.18
CEM Coping	0.15	0.19	0.13
ERC Lability/Negativity	0.17	0.19	0.15
ADIS-P Overall Severity	-0.03	0.05	-0.09
Late TPOCS-A Task-Collaboration[a]			
FSIQ-2	0.01	0.01	0.25[†]
Readiness to Participate	-0.07	0.05	-0.19
CEM Inhibition	0.46	0.25	0.28[†]
CEM Dysregulation	-0.43	0.24	-0.26[†]
CEM Coping	0.30	0.25	0.18
ERC Lability/Negativity	-0.12	0.25	-0.07
ADIS-P Overall Severity	-0.10	0.06	-0.26[†]

Note. ADIS-P = Anxiety Disorders Interview Schedule for DSM-IV - Parent Version; CEM = Children's Emotion Management Scale; ERC = Emotion Regulation Checklist; ERSSQ = Emotion Regulation and Social Skills Questionnaire; FSIQ-2 = Wechsler Abbreviated Scale of Intelligence, Full-Scale IQ-2 Subscales; TPOCS-A = Therapist Process Observational Coding System – Alliance Scale. R^2 for Early TPOCS-A Bond = .20, p = .34; R^2 for Early TPOCS-A Task-Collaboration = .29, p = .09; R^2 for Late TPOCS-A Bond = .21, p = .27; R^2 for Late TPOCS-A Task-Collaboration = .40, p = .01.

[a]Outcome variable.

[†] $p < .10$.

Table 5

Spearman Rho Correlations Between Early TABBS Items and Late TPOCS-A Ratings

Variable	2	3	4	5	6	7	8	9	10	11	12
1. Bond[a]	.61**	-.00	.31*	.08	.28†	.02	.11	.36*	-.31*	-.19	.14
2. Task-Collaboration[a]	-	.23	.17	.09	.20	-.09	.02	.27†	-.40**	-.23	.15
3. Customizing the session		-	.06	-.13	.08	-.30*	-.11	.08	-.02	.17	.20
4. Being playful			-	.20	.41**	.07	.24	.14	-.38*	-.18	-.09
5. Hope-encouragement				-	.35*	.65**	.31*	.31*	.10	-.37*	.05
6. Collaboration					-	.42**	.05	.14	-.36*	-.18	-.28†
7. Validating						-	.28†	.36*	-.01	-.24	.02
8. General conversation							-	.24	-.11	.30*	.09
9. Common ground								-	-.16	-.16	.14
10. Pushing the child									-	.11	.17
11. Being too formal										-	.17
12. Inappropriate talk											-

Note. TABBS = Therapist Alliance-Building Behavior Scale; TPOCS-A = Therapist Process Observational Coding System – Alliance Scale.

[a] TPOCS-A subscales.

** *p* < .01. * *p* < .05. † *p* < .10.

Table 6

Linear Regression Analysis for Early Session Therapist Behaviours Predicting Late Therapeutic Alliance

Variable	*B*	*SE B*	*β*
Late TPOCS-A Bond[a]			
Customizing the session	-0.08	0.10	-0.12
Being playful	0.11	0.12	0.16
Hope-encouragement	-0.13	0.12	-0.18
Collaboration	0.19	0.14	0.24
General conversation	-0.06	0.13	-0.07
Common ground	0.24	0.15	0.25
Pushing the child	-0.27	0.27	-0.15
Being too formal	-0.08	0.11	-0.13
Inappropriate talk	0.22	0.14	0.24
Late TPOCS-A Task-Collaboration[a]			
Customizing the session	0.10	0.13	0.11
Being playful	-0.05	0.16	-0.05
Hope-encouragement	-0.15	0.17	-0.15
Collaboration	0.20	0.20	0.18
General conversation	-0.22	0.18	-0.18
Common ground	0.26	0.21	0.19
Pushing the child	-0.91	0.37	-0.35*
Being too formal	-0.25	0.15	-0.27[†]
Inappropriate talk	0.35	0.20	0.26[†]

Note. TPOCS-A = Therapist Process Observational Coding System – Alliance Scale. R^2 for Late TPOCS-A Bond = .27, p = .16; R^2 for Late TPOCS-A Task-Collaboration = .35, p = .04. [a]Outcome variable.
* $p < .05$. [†] $p < .10$.

Table 7

Linear Regression Analyses for Therapeutic Alliance Predicting Treatment Outcome

Variable	Early Sessions				Late Sessions			
	B	*SE B*	*β*	*p*	*B*	*SE B*	*β*	*p*
CEM Inhibition[a]								
Baseline score	0.75	0.17	0.63	<.001	0.78	0.17	0.66	<.001
Days in treatment	<0.01	<0.01	0.06	.63	<0.01	<0.01	0.06	.65
FSIQ-2	<-0.01	0.01	-0.12	.37	<-0.01	0.01	-0.07	.63
TPOCS-A Bond	0.04	0.19	0.04	0.82	0.03	0.19	0.02	.90
TPOCS-A Task	-0.09	0.12	-0.14	0.44	-0.15	0.13	-0.20	.27
CEM Dysregulation[a]								
Baseline score	0.19	0.13	0.25	.14	0.15	0.12	0.19	.23
Days in treatment	<0.01	<0.01	-0.01	.95	<-0.01	<0.01	-0.05	.72
FSIQ-2	<0.01	<0.01	0.15	.32	0.01	<0.01	0.27	.09
TPOCS-A Bond	0.14	0.13	0.22	.27	0.05	0.13	-0.08	.69
TPOCS-A Task	-0.16	0.09	-0.39	.07	-0.19	0.09	-0.45	.04
CEM Coping[a]								
Baseline score	0.45	0.13	0.52	<.01	0.42	0.12	0.48	<.01
Days in treatment	<0.01	<0.01	0.12	.36	<0.01	<0.01	0.17	.19
FSIQ-2	<0.01	<0.01	0.08	.56	<-0.01	<0.01	<0.01	.99
TPOCS-A Bond	0.04	0.13	0.05	.77	-0.07	0.13	-0.09	.60
TPOCS-A Task	0.08	0.09	0.16	.41	0.17	0.09	0.34	.07
ERC Lability/Negativity[a]								
Baseline score	0.80	0.11	0.76	<.001	0.72	0.11	0.68	<.001
Days in treatment	<0.01	<0.01	0.03	.79	<0.01	<0.01	-0.01	.88
FSIQ-2	<0.01	<0.01	0.11	.28	0.01	<0.01	0.16	.12
TPOCS-A Bond	-0.12	0.12	-0.13	.35	0.10	0.12	0.11	.41
TPOCS-A Task	-0.02	0.08	-0.04	.79	-0.22	0.09	-0.36	.02
ERC Emotion Regulation[a]								
Baseline score	0.57	0.08	0.76	<.001	0.57	0.08	0.75	<.001
Days in treatment	<0.01	<0.01	0.02	.85	<0.01	<0.01	0.03	.74
FSIQ-2	<0.01	<0.01	0.06	.60	<0.01	<0.01	0.02	.89
TPOCS-A Bond	-0.05	0.10	-0.07	.62	-0.05	0.10	-0.07	.61
TPOCS-A Task	0.05	0.07	0.11	.45	0.10	0.07	0.20	.17
ERSSQ[a]								
Baseline score	0.60	0.15	0.56	<.001	0.57	0.15	0.53	<.001
Days in treatment	<-0.01	<.01	<-0.01	.99	<0.01	<0.01	0.03	.81
FSIQ-2	<0.01	<.01	0.03	.81	<0.01	<0.01	-0.01	.97
TPOCS-A Bond	0.12	0.15	0.13	.44	-0.01	0.16	-0.01	.95
TPOCS-A Task	0.01	0.10	0.02	.91	0.12	0.11	0.20	.29

BASC-2 Externalizing[a]								
Baseline score	0.88	0.07	0.90	<.001	0.81	0.07	0.84	<.001
Days in treatment	0.03	0.05	0.05	.52	0.02	0.04	0.03	.70
FSIQ-2	0.04	0.05	0.06	.40	0.06	0.05	0.08	.25
TPOCS-A Bond	-0.71	1.97	-0.03	.72	3.90	1.83	0.19	.04
TPOCS-A Task	-0.01	1.24	<-0.01	.99	-3.87	1.33	-0.27	.01
BASC-2 Internalizing[a]								
Baseline score	0.95	0.10	0.85	<.001	0.96	0.10	0.86	<.001
Days in treatment	-0.02	0.07	-0.02	.80	-0.01	0.07	-0.01	.93
FSIQ-2	0.04	0.08	0.04	.63	0.02	0.08	0.02	.84
TPOCS-A Bond	-1.51	2.97	-0.06	.61	-0.02	3.06	<-0.01	.99
TPOCS-A Task	2.02	1.87	0.12	.29	1.31	2.19	0.07	.55
BASC-2 BSI[a]								
Baseline score	0.88	0.10	0.83	<.001	0.83	0.10	0.78	<.001
Days in treatment	0.02	0.06	0.03	.76	0.01	0.06	0.01	.93
FSIQ-2	0.02	0.07	0.02	.79	0.05	0.07	0.06	.50
TPOCS-A Bond	-0.87	2.65	-0.04	.74	0.84	2.71	0.04	.76
TPOCS-A Task	-0.74	1.67	-0.05	.66	-2.91	1.96	-0.19	.15
BASC-2 Adaptive Skills[a]								
Baseline score	0.87	0.08	0.86	<.001	0.88	0.08	0.87	<.001
Days in treatment	0.06	0.04	0.13	.12	0.07	0.04	0.14	.06
FSIQ-2	<-0.01	0.04	-0.01	.92	-0.04	0.04	-0.05	.51
TPOCS-A Bond	0.99	1.62	0.06	.55	-0.02	1.53	<-0.01	.99
TPOCS-A Task	-0.01	1.02	<-0.01	.99	1.87	1.06	0.17	.09
ADIS-P Overall Severity[a]								
Baseline score	0.49	0.17	0.40	.01	0.47	0.18	0.38	.01
Days in treatment	<0.01	0.02	<0.01	.99	<-0.01	0.02	-0.02	.87
FSIQ-2	0.03	0.02	0.22	.12	0.05	0.02	0.31	.04
TPOCS-A Bond	1.03	0.80	0.24	.20	-0.42	0.82	-0.10	.61
TPOCS-A Task	-0.88	0.51	-0.32	.09	-0.47	0.58	-0.16	.43
CGI Severity[a]								
Baseline score	0.57	0.13	0.57	<.001	0.53	0.13	0.53	<.001
Days in treatment	-0.01	0.01	-0.06	.66	-0.01	0.01	-0.10	.46
FSIQ-2	0.01	0.01	0.05	.67	0.01	0.01	0.11	.41
TPOCS-A Bond	0.04	0.54	0.01	.94	0.05	0.55	0.02	.93
TPOCS-A Task	-0.29	0.35	-0.14	.41	-0.52	0.40	-0.24	.20

Note. ADIS-P = Anxiety Disorders Interview Schedule for DSM-IV - Parent Version; BASC-2 = Behavior Assessment for Children, 2nd Edition; BSI = Behavioral Symptoms Index; CEM = Children's Emotion Management Scale; CGI = Clinical Global Impressions Scale; ERC = Emotion Regulation Checklist; ERSSQ = Emotion Regulation and Social Skills Questionnaire; FSIQ-2 = Wechsler Abbreviated Scale of Intelligence, Full-Scale IQ-2 Subscales; TPOCS-A = Therapist Process Observational Coding System – Alliance Scale.
[a]Outcome variable

Supplementary Table 1

Pearson Correlations Between Pre-Treatment Child Characteristics

Characteristic	2	3	4	5	6	7	8	9	10	11	12	13
1. Readiness	.24	-.16	.19	.01	.12	-.13	-.12	.14	-.04	.08	-.07	.06
2. CEM Inhibition	-	-.25	.40**	.02	-.20	.05	-.10	-.08	-.06	.02	.08	.01
3. CEM Dysregulation		-	-.31*	.13	-.17	-.21	.27+	.26+	.20	-.13	-.01	.16
4. CEM Coping			-	-.13	-.07	.28+	-.21	-.24	-.16	.05	.03	-.03
5. ERC Lability/Negativity				-	-.26+	-.51**	.69**	.40**	.68**	-.38**	.37*	.52*
6. ERC Emotion Regulation					-	.62**	-.12	-.38**	-.47**	.63**	-.21	-.23
7. ERSSQ						-	-.30*	-.53**	-.58**	.52**	-.32*	-.47**
8. BASC-2 Externalizing							-	.45**	.79**	-.36*	.22	.41**
9. BASC-2 Internalizing								-	.74**	-.39**	.36*	.58**
10. BASC-2 BSI									-	-.63**	.34*	.50**
11. BASC-2 Adaptive Skills										-	-.04	-.11
12. ADIS-P Overall Severity											-	.86**
13. CGI Severity												-

Note. ADIS-P = Anxiety Disorders Interview Schedule for DSM-IV - Parent Version; BASC-2 = Behavior Assessment for Children, 2nd Edition; BSI = Behavioral Symptoms Index; CEM = Children's Emotion Management Scale; CGI = Clinical Global Impressions Scale; ERC = Emotion Regulation Checklist; ERSSQ = Emotion Regulation and Social Skills Questionnaire.

** $p < .01$. * $p < .05$. † $p < .10$.

Appendix A: Examples of Therapeutic Alliance and Therapist Behaviours Coding Schemes

Rater Name: _____
Coding Date: _____
Subject ID #: _____
Session #: _____
Target Client: **CHILD**

Session Length (mm:ss): _____
Check one:
[ ] Primary Coder
[ ] Reliability Coder

ALLIANCE SCALE (TPOCS-A; McLeod & Weisz, 2005)

0   1   2   3   4   5
Not at all   Somewhat   Great Deal

PART A: BOND

To what extent did the client…

_____ A1. …indicate that s/he experiences the therapist as understanding and/or supporting (*Consider frequency and/or intensity*)?

_____ A2. …acts in a hostile, critical, or defensive manner toward the therapist (*Consider frequency and/or intensity*)?

_____ A3. …demonstrate positive affect toward the therapist (*Consider frequency and/or intensity*)?

_____ A4. …share his/her experience with the therapist (*Consider frequency*)?

_____ A5. …appear uncomfortable when interacting with the therapist (*Consider frequency*)?

To what extent did the therapist and client…

_____ A6. …appear anxious or uncomfortable interacting with one another (*Consider frequency*)?

PART B: THERAPEUTIC TASKS

To what extent did the client…

_____ B1. …use therapeutic tasks to make changes outside the session (*If clear evidence exists, consider frequency and/or intensity*)?

_____ B2. …not comply with therapeutic tasks (*Consider frequency and/or intensity*)?

To what extent did the therapist and client…

_____ B3. …work together equally on therapeutic tasks? (Consider frequency and/or intensity)

Figure A1. Example of Therapeutic Process Observational Coding System – Alliance Scale

(TPOCS-A) coding sheet.

ALLIANCE-BUILDING BEHAVIOURS (TABBS; Creed & Kendall, 2005)

T. = Therapist

0	1	2	3
Absent or present below typical level			Strong or present far above typical level

POSITIVE-VALENCE ITEMS

_____ P1. **Customizing the session**
T. customizes the session for the child, including (but not limited to) asking for information about the child's likes and dislikes, and then incorporates that information into the session in the form of examples, rewards, and other session tasks.

_____ P2. **Being playful**
T. presents individual tasks and therapy as a whole in a playful way. T. does not hesitate to get down on the floor and play with the child and gets involved in fun activities/games with the child as a reward, a therapy task, or to facilitate session material.

_____ P3. **Providing hope and encouragement**
T. expresses encouragement about therapy, hope for improvement, and a belief that the child is or will make progress.

_____ P4. **Collaboration**
T. presents treatment as a team effort, building a sense of togetherness with words like "we," "us," and "let's." T. has the child help set goals for therapy and presents treatment as a way to address the child's worries and concerns. T. also encourages the child's participation and involvement, and encourages specific feedback from the child.

_____ P5. **Validating**
T. shows respect and understanding for the child's feelings, thoughts, and behaviour in ways that may include responding to child's hesitation about therapy or anxious situations, as well as exploring problems in the therapist-child relationship if they appear.

_____ P6. **Having general conversations**
Conversations between T. and the child without a focus on anxiety or treatment, about a topic of some interest to the child.

_____ P7. **Finding common ground**
Things T. does to emphasize common ground with the child so that the child might feel special and connected to the therapist. These can be comments T. makes in response to the child, in which the therapist is, in essence, saying "Me, too!" or in which T. is telling the child something so that the child may, in essence, say, "Me, too!"

NOTE: T. comments that were overly personal should be rated no higher than 1 on a 0-3 scale (p. 500).

NEGATIVE-VALENCE ITEMS

_____ N1. **Pushing the child to talk**
T. pressures the child to talk about anxiety. This does not refer to conversations in which the child willingly discusses anxiety and was not scored unless the therapist continued to ask about anxiety beyond the point in which the child seems interested or comfortable.

_____ N2. **Being too formal**
Ways T. makes the relationship formal instead of relaxed and comfortable, including (but not limited to) talking to the child in ways that appear aloof, punishing, stuffy, or patronizing.

_____ N3. **Not following through on promises**
Instances in which T. does not follow through on promises made to the child or disappoints the child's expectations (e.g., not following through on expected rewards or activities). The expectations may or may not be realistic or have been set up by the therapist; however, if they are realistic or based on things the therapist has said or done, then this would contribute to a higher score in this category.

_____ N4. **Talking at an inappropriate level**
Times that T. talks in a way that may alienate the child, including talking at a level above or below that which is appropriate for the child's age, conversations with family that exclude the child, or talking about the child like he or she is not in the room.

Figure A2. Example of Therapist Alliance-Building Behaviors Scale (TABBS) coding sheet.

Appendix B: Summary of Significant and Trending Results

Research Question #1: Do pre-treatment child characteristics, including emotional and behavioural functioning, emotion regulation, and readiness to participate in treatment predict the quality of therapeutic alliance in CBT for children with autism?

- Early therapeutic bond was positively related to child-reported emotional inhibition.
- Early task-collaboration was positively related to child-reported coping skills and parent-reported emotion regulation and social skills, and negatively related to child-reported emotion dysregulation.
  - There were additional trending associations with child-reported readiness to participate and emotional inhibition (in positive direction).
- Late therapeutic bond was positively related to child-reported emotional inhibition.
  - There were additional trending associations with IQ (in positive direction) and child-reported emotion dysregulation (in negative direction).
- Late task-collaboration was positively related to IQ, child-reported emotional inhibition, and parent-reported emotion regulation and social skills, and negatively related to child-reported emotion dysregulation, parent-reported lability and negativity, and externalizing and behavioural symptoms, and clinician-reported symptom severity.
  - There were additional trending associations with child-reported coping skills (in positive direction) and parent-reported internalizing problems (in negative direction).
- The overall model predicting late task-collaboration was significant, but no significant unique predictors emerged.

- IQ, child-reported emotional inhibition and dysregulation, and clinical-reported symptom severity were trending as unique predictors.
- The overall model predicting early task-collaboration was trending.

Research Question #2: Do therapist skills applied early on in therapy influence the quality of therapeutic alliance in subsequent sessions?

- Therapeutic bond was positively related to being playful and finding common ground in early sessions, and negatively related to pushing the child to talk.
  - Collaborating in early sessions had a trending association with therapeutic bond in later sessions (in the positive direction).
- Task-collaboration in later sessions was negatively related to pushing the child to talk in early sessions.
  - Finding common ground in early sessions had a trending a association with task-collaboration in later sessions (in the positive direction).
- The overall model predicting late task-collaboration was significant, and pushing the child to talk emerged as the sole significant unique predictor.
  - Being too formal and talking at an inappropriate level were trending as unique predictors.

Research Questions #3: Is therapeutic alliance a significant predictor of treatment outcomes?

- Late therapeutic-task collaboration was related to decreases in parent-reported lability and negativity, and increases in parent-reported adaptive skills.

- Overall models predicting changes in parent-reported lability and negativity, and externalizing problems were significant.

    o Late task-collaboration was a unique predictor for both of these outcomes.

- Though the overall model was not significant, late task-collaboration emerged as a unique predictor of changes in child-reported emotion dysregulation.