Autism, Anxiety, and School Functioning

Improving School Functioning by Reducing Anxiety in Children on the Spectrum. Final Report

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Autism, Anxiety and School Functioning

IMPROVING SCHOOL FUNCTIONING BY REDUCING ANXIETY IN CHILDREN ON THE SPECTRUM.

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Copies of this report can be downloaded from the Autism CRC website autismcrc.com.au

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The Cooperative Research Centre for Living with Autism (Autism CRC)

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Abstract

School success is vital for the development of children who are on the autism spectrum;[1] however, many children on the spectrum experience high levels of anxiety at school. In this study, we investigated whether participation in a group cognitive-behavioural therapy (CBT) anxiety program assists children on the autism spectrum to function better at school, including their anxiety, mood, social skills, and academic outcomes. We also sought to test if including a brief intervention with class teachers boosted the impact of this program. A total of 24 families of a child on the autism spectrum and high levels of anxiety were randomly assigned to a 10-week group CBT or CBT+teacher intervention; 18 families completed treatment. Half of the teachers in the CBT+teacher intervention declined participation. Results replicated large benefits to parent-, but not child-, reported anxiety consistent with previous CBT trials; benefits to decreased depression, social vulnerability, and attendance at school were also seen. Teacher reports and the impact of the added teacher intervention could not be systematically examined due to low teacher participation rates. In sum, this adds to previous studies documenting large parent-reported decreases in anxiety for children on the autism spectrum, and extends them to suggest that the benefit may be more generally to lower internalising symptoms. However, because minimal benefits were seen to children's adjustment at school, a

[1]While it is acknowledged that the term 'autistic spectrum disorder' (or ASD) is used with respect to a diagnosis consistent with the DSM-5, The key term used in this report will be 'on the autism spectrum' or 'on the spectrum,' consistent with the Autism CRC style guide and use of inclusive language that does not focus on disorder.

priority for future research will be to consider how to best help these children address their anxiety at school.

Introduction

Approximately 1 in every 150 children has an autism spectrum disorder (ASD) (Centers for Disease Control, 2007). In the current edition of the Diagnostic and Statistical Manual (DSM-5), ASD is defined by the presence of two main symptoms: deficits in social interactions and communication, and idiosyncratic behaviour such as repetitive behaviour patterns or restricted interests (American Psychiatric Association, 2013). ASD is thought to be a developmental disorder with longstanding consequences, and is often experienced comorbidly with other disorders (Howlin, Goode, Hutton, & Rutter, 2004). Perhaps most notably, anxiety is commonly high in children on the autism spectrum (Bellini, 2004; de Bruin, Ferdinand, Meester, de Nijs, & Verheij, 2007), with approximately half of children with on the spectrum having such high anxiety levels that they also meet criteria for an anxiety disorder (estimates ranging from 30–84%) (e.g., de Bruin et al., 2007; Klin, Pauls, Schultz, & Volkmar, 2005; Muris, Steerneman, Merckelbach, Holdrinet, & Meesters, 1998; Simonoff, Pickles, Charman, Chandler, Loucas, & Baird, 2008). Anxiety exacerbates a child's current impairment and leads to additional problems of aggression, oppositionality, and poorer social skills relative to children on the spectrum with no anxiety (Simonoff, Pickles, Charman, Chandler, Loucas, & Baird, 2008). Not surprisingly, a survey of parents by the National Autistic Society in the UK found that anxiety was the second most highly cited problem (Mills & Wing, 2005). In sum, anxiety is common and challenging for children on the autism spectrum.

For this reason, we urgently need treatments that can effectively address anxiety for these children (e.g., Sofronoff, Attwood, & Hinton, 2005). In particular, treatments are needed that can address the child's anxiety at school, as school is

where anxiety is frequently experienced because school requires social, communication, and flexibility skills that are core deficits to autism. For example, children at school need to make frequent, and often unforeseen, changes in their environments, which is a problem for children on the spectrum who experience difficulty (and often anxiety) with handling transitions. As such, a substitute teacher, field trip, or pop quiz can trigger emotional distress or outbursts that obstructs social and academic functioning. These problems are likely to further heighten anxiety, and limit the learning and academic outcomes of children on the spectrum (e.g., Wood & Gadow, 2010). Surprisingly, there is yet to be a comprehensive investigation of the degree to which reducing anxiety leads to improvements in school functioning. Investigation into the potential for anxiety treatment to increase adjustment at school in children on the autism spectrum is a priority, as success at school is vital to the wellbeing and future of all children (e.g., Fujii et al., 2013). Thus, the purpose of the present investigation is to address how to effectively and feasibly address anxiety in children on the autism spectrum at school.

Anxiety intervention programs, especially those following a cognitive-behavioural therapy (CBT) model, have been developed and well-tested for typically developing children with anxiety disorders (e.g., Galla et al., 2012). These show robust and long-lasting results across settings, placing individual and group CBT as a well-established treatment for youth with anxiety (Silverman, Pina, & Viswesvaran, 2008). However, relying on these programs for children on the spectrum may be problematic given the cognitive, social and communication challenges that are core to autism (e.g., Baker, Koegel, & Koegel, 1998; Chalfant, Rapee, & Carroll, 2007). Rather than a program that relies heavily on verbal discussion, for example, children on the spectrum may benefit more from visual aids and clearly outlined schedules for the process and content of each group (e.g., Chalfant et al., 2007). Thus, although

the exceptionally strong results of CBT with typically developing youth provide a solid starting point for treatment with children on the spectrum, a modified program that is sensitive to their needs is required (Chalfant et al., 2007; Fujii et al., 2013).

To date, several studies have now undertaken modifications of traditional CBT programs for typically developing youth with anxiety, and tested their outcomes for children on the autism spectrum. Although the degree of modifications to traditional CBT have varied from study to study, in general the core components of identifying anxious thoughts, developing coping skills, and gradual exposure to feared hierarchies have remained constant. These programs have ranged from 6 (Sofronoff, Attwood, Hinton, & Levin, 2007) to 32 (Fujii et al., 2013) weeks in length, with sessions provided in group (e.g., Chalfant et al., 2007) or individual (e.g., Wood, Drahota, Sze, Har, Chui, & Langer, 2009) formats, delivered to parents and children (e.g., Chalfant et al., 2007), only children (Sung et al., 2011), or the family (e.g., Wood et al., 2009).

Despite these discrepancies in treatment format, empirical evaluations of these approaches ranging from case studies and small groups to moderate-sized exploratory randomized clinical trials have consistently indicated moderate-to-large decreases in anxiety disorders in children on the autism spectrum (Chalfant et al., 2007; Fujii et al., 2013; Reaven, Blakely-Smith, Culhane-Shelburne, & Hepburn, 2012; MacKinnon, Commerford, Parham, & Roberts, 2014; McNally Keehn, Lincoln, Brown, & Chavira, 2013; Sofronoff et al., 2007; Sung, Ooi, Goh, Pathy, Fung, Ang, Chua, & Lam, 2011; Wood et al., 2009a; Sze & Wood, 2008). This is especially true with respect to decreases in clinical diagnoses and parent-reported anxiety, with some studies also showing benefits to child-reported anxiety (e.g., Chalfant et al., 2007) and others not (e.g., Wood et al., 2009). Only one study could be identified that also obtained teacher reports, which found decreases in teacher-reported

anxiety following CBT (Chalfant et al., 2007). There is some indication that, in addition to decreased anxiety, the positive outcomes of CBT might extend to related symptoms (e.g., mood and behaviour problems; Chalfant et al., 2007). However, in a study using the same therapy as Chalfant et al. but with children on the autism spectrum and comorbid intellectual disabilities, benefits outside of anxiety were not replicated (MacKinnon et al., 2013). Still, taken together, the emerging reports suggest that CBT is a promising treatment to decrease anxiety in children on the autism spectrum, with effects similar to CBT with typically developing children with anxiety (e.g., Silverman et al., 2008).

Although this indicates that CBT holds potential as an effective way to decrease anxiety in children on the spectrum, one problem is that these therapies are generally limited to focusing on the child and/or parents. Ironically, given the importance of school for these children, the potential for the teacher to contribute to the child's outcome has rarely been considered. Because school is a major source of anxiety for many children on the spectrum, creating a program that directly involves the teacher may enable strategies to be implemented more successfully at school. This is especially an issue because children on the autism spectrum are especially likely to experience difficulty in generalizing their skills and learning across contexts, such as from the clinic to school. For example, children on the autism spectrum have shown marked difficulty in extending their social skill learning from therapy to other situations, such as school (e.g., Hwang & Hughes, 2000). Thus, considering that school is where anxiety is frequently triggered, and that when triggered, has serious consequences for learning and social success, further work on current CBT for decreasing anxiety in children on the spectrum is needed (e.g., Attwood, 2004). In particular, combining parent and teacher involvement may best support the child in implementing new skills (Reaven & Hepburn, 2006).

Only two examples of treatments that have included the school context could be identified. In a recent study, Fujii et al. (2013) included a school personnel training component in a small investigation of the impact of an intensive, 32-week, treatment that addressed anxiety and social skills of 12 children on the autism spectrum and anxiety aged 7- to 11- years. Although promising results were seen on parent-reported anxiety ratings, teacher ratings were not gathered and as such it is not possible to determine if including school staff in treatment aided generalization of the anxiety treatment. A second exception is a larger study of 36 children with an ASD and anxiety, also aged 7- to 11- years, who received 16 weeks of a modularized treatment that also addressed concomitant needs, such as social and adaptive skill problems (Wood et al., 2009). Benefits to parent-reported anxiety were seen, although this did not extend to child reports and, similar to Fujii et al., teacher reports of child anxiety were not gathered. Furthermore, neither study included a no-teacher/school staff component, which would not allow for an examination of whether or not including the teacher boosts the effectiveness of therapy.

In sum, treating anxiety in children on the autism spectrum using CBT has great potential, although currently results of programs have been almost exclusively limited to parent and/or child report. To date, there has not been sufficient research on the outcome of therapy that focuses the child's experience of anxiety at school. Excluding a focus on the child's school experience is a problem because, of all contexts, the school or classroom is where children on the spectrum are likely to experience anxiety, and where it is likely to cause significant social and academic impairment. School success is vital for the development of children on the autism spectrum; thus, if we are truly to invest in meeting the needs and fostering the development of children with autism, we need to address their anxiety at school. To begin to address these research needs, we sought to investigate whether

participation in a group anxiety program assists children on the spectrum to function better at school, including their anxiety, mood, social skills, and academic outcomes. Specifically, our first aim was to replicate the impact of a cognitive-behavioural program in decreasing anxiety in children on the autism spectrum. We hypothesised that parents' reports of anxiety would decrease pre- to post- treatment, although we made no hypotheses for child report given the conflicting literature for child reports (e.g., Chalfant et al., 2007; Wood et al., 2009). The second aim was to investigate if benefits to reducing anxiety also extended to decreases in related problems, including mood, social interactions, and, importantly, school functioning. Given conflicting past reports (i.e., Chalfant et al., 2007 vs MacKinnon et al., 2013), no clear hypotheses were made. As a final aim, we sought to investigate if incorporating a teacher component into an anxiety program extends or boosts the benefits of the standard program. It is predicted that adding the teacher component will result in greater reduction in anxiety at school and better school functioning relative to the standard anxiety program with no involvement of teachers.

Method

PARTICIPANTS

Relevant institutional ethics approvals were obtained for the present study. A broad recruitment strategy was used. This included recruiting participants through notices sent through the electronic mailing list of the Western Australian Autism Biological Registry (WAABR), placed in newsletters of consenting local state, Catholic, and independent primary schools, and on the websites of autism-related organizations in Western Australia and nationally. Recruitment notices were also distributed at an autism awareness day. Informed assent was obtained from all participating children (at the pre-group assessment), and informed consent was collected from all participating parents (online and at the pre-group assessment) and teachers (online). In the screening phase, 47 parents of children on the spectrum completed the Screen for Child Anxiety Related Disorders – Parent version (SCARED-P; Birmaher, Khetarpal, Cully, Brent, & McKenzie, 1995). The SCARED scores ranged from 8 to 79 (M = 40.72, SD = 16.52). Families who had a score of 25 and above on the SCARED (n = 39) were contacted via telephone; of these, 4 children were not eligible for the study due to comorbid intellectual disability, and 8 families could not be contacted or declined to participate in the program. The remaining 27 families were invited to attend a pre-group assessment, during which 2 children were not able to complete the assessment due to marked behavioural difficulties, and were thus assessed to be unsuitable for the group program. One family declined further participation in the program. All families that did not participate further were offered a list of resources for their child's anxiety.

Based on the participant characteristics outlined in the Cool Kids ASD adaptation therapist manual (Chalfant, Lyneham, Rapee, & Carroll, 2011), as well as

in previous similar trials, the following inclusion criteria were specified: 1) chronological age of the child between 8 and 12 years old; 2) parent-report of an ASD diagnosis from an accredited health professional; 3) no known intellectual disability, as reported by parent; 4) clinical levels of anxiety, as suggested by a score of 25 or more on the SCARED-P (Birmaher et al., 1999). Formal assessments for autism were not conducted as the main recruitment channels were through autism organizations that required families to have an ASD diagnosis for membership.

Thus, a total of 24 families were assigned, by order of enrolment, to an immediate treatment ($n = 10$) or waitlist ($n = 14$) condition. Assignment to condition based on order of enrolment was needed because the treatment programs were scheduled to fit within the second and third school terms in order to ease participant burden; this meant that families who made earlier contact and had earlier assessment appointments were first assigned to treatment. Order of enrolment and conducting assessment sessions was not systematically biased (i.e., there were no differences in our recruitment strategy for earlier than later families, and dates of assessments were arranged based on joint availability of clinic space, the family, and an assessing therapist team and not based on any characteristic of the family and/or child). Thus, this assignment method approximates random assignment. Demographic information for the overall sample, as well as the immediate treatment and waitlist conditions, are illustrated in Table 1. As can be seen in this table, no differences between treatment and waitlist conditions were seen based on demographics.

Table 1. *Demographic information for the overall sample, immediate treatment, and waitlist conditions.*

Demographic variables	Overall sample (*N* = 24)	Immediate treatment (*n* = 10)	Waitlist (*n* = 14)
Gender			
Male	18	7	11
Female	6	3	3
Age [*M*(*SD*)]	9.1 (1.2)	9.3 (1.4)	9.0 (1.1)
School grade	3 – 7	3 – 7	3 – 6

Within each treatment condition, participants were further randomly assigned to a teacher intervention condition (*n* = 12) and a control condition involving no teacher intervention (i.e., treatment as usual, *n* = 12), as determined by a coin toss. Two children were home-schooled due to significant anxiety relating to school. Of the remaining 22 children, 22 schools were approached to participate in the teacher component of the project. In accordance with our school board's policy on inviting teachers to participate, we first approached the school principal; 17 principals provided consent for the child's class teacher to be contacted and to participate in the study if the teacher gave consent to do so. We then approached 17 teachers about the project. Of these, 16 provided consent and completed initial assessment measures, although not all continued to participate throughout the trial. Of the 12 children assigned to the teacher intervention condition, 6 consented and were able to schedule a time to participate in the teacher intervention (the other 6 teachers either

declined to participate or did not respond to our attempts to contact, with three attempts to contact being made for each teacher).

MEASURES.

Participating parents, children, and teachers were asked to complete assessment measures covering a range of domains including anxiety and mood, social functioning, and school functioning. Participants in the immediate treatment condition were asked to complete these at three time-points: immediately prior to treatment, immediately after treatment ended, and at an 8-week post-treatment follow-up. However, participants in the waitlist condition were also asked to complete the anxiety and mood measures one extra time, just at the start of being on the waitlist. The questionnaires detailed here were part of a larger battery of tests for the project.

Anxiety and depression measures. The following anxiety measures were selected on the basis of demonstrated suitability and robust psychometric properties when administered with children on the spectrum (Grondhuis & Aman, 2012; Wigham & McConachie, 2014). Different anxiety measures were chosen to reduce contamination between screening and outcome measures.

Screen for Child Anxiety Related Disorders – Parent version (SCARED-P; Birmaher et al., 1995). The SCARED-P is a 41-item parent-rated measure that taps into symptoms corresponding with the DSM child anxiety disorders. Items are rated on a three-point scale from 0 ('not true or hardly ever true') to 2 ('very true or often true') in terms of frequency of experience over the past three months, and can be summed to derive a total score. A total score of 25 or more may be indicative of an anxiety disorder (Birmaher et al., 1997). The parent version of the SCARED was administered as an online screening questionnaire.

Spence Children's Anxiety Scale (SCAS). The parent- (SCAS-P; 39 items), child- (SCAS-C; 44 items) and teacher-rated (SCAS-T; 22 items) versions of the SCAS were used in the present study. The SCAS asks respondents to rate the frequency with which the child experiences a range of anxiety symptoms. These anxiety symptoms correspond to DSM symptom criteria for separation anxiety, social phobia, generalized anxiety disorder, panic/agoraphobia, obsessive-compulsive disorder, and physical injury fears (Spence, 1998). The parent (Nauta et al., 2004) and child (Spence, 1998) versions are rated on a four-point scale from 'never' to 'always', while the teacher version (which is an adaptation of the parent-rated preschool version) is rated on a five-point scale from 'not at all true' to 'very often true'. Higher scores indicate higher levels of anxiety. The SCAS demonstrated high internal consistency ($\alpha = .89$ for SCAS-P and $\alpha = .92$ for SCAS-C) and good discriminant validity between children with and without clinical anxiety (Nauta et al., 2004; Spence, 1998). There is no available data on psychometric properties for the SCAS-T.

Child Anxiety Life Interference Scale (CALIS; Lyneham et al., 2013). The parent-report (CALIS-P; 16 items) and child-report (CALIS-C; 9 items) were both administered to evaluate the extent to which the child's fears and worries impacted on different areas of life functioning (e.g., relationship with parent, school, daily activities). Each item is rated on a five-point scale from 0 ('not at all') to 4 ('a great deal'). Higher scores on the CALIS indicate greater life interference. The CALIS exhibited high internal consistency ($.84 \leq \alpha \leq .90$) and good concurrent validity with the SCAS ($.54 \leq r \leq .64$; Lyneham et al., 2013).

Mood and Feelings Questionnaire – short version (MFQ; Angold, Costello, Messer, & Pickles, 1995). Due to the common comorbidity of anxiety and depression (Beattie & Sullivan, 2014; Costello, Mustillo, Erkanli, Keeler, & Angold, 2003), a

depression measure was included in the test battery. The MFQ contains 13 items that assess the extent to which the child has experienced symptoms of depression in the past two weeks. Items are rated on a three-point scale, from 0 ('not true') to 2 ('true'), with higher scores indicating higher levels of depression. Both parent- (MFQ-P) and child-report (MFQ-C) versions were used. The MFQ has good internal consistency (α = .87 for MFQ-P and α = .85 for MFQ-C) and discriminant validity between clinical and non-clinical samples.

Social functioning measures.

Social Skills Questionnaire (SSQ; Spence, 1995). The SSQ consists of 30 questions assessing the extent to which a child has demonstrated a range of social skills in the past four weeks (e.g., communicating assertively, engaging in cooperative play and prosocial behaviour). Questions are rated on a three-point scale from 0 ('not true') to 2 ('mostly true'), with higher scores indicating greater social skills. The parent (SSQ-P) and teacher (SSQ-T) versions were included in the present study, and items only differed in reference to "your child" versus "your student". The SSQ demonstrated high internal consistency ($\alpha \geq$ .48) and sound concurrent validity with measures of social competence ($r \geq$ .48); the SSQ-P and SSQ-T shared a weak correlation (r = .25; Spence, 1995).

Children's Social Vulnerability Questionnaire (CSVQ; Seward, Bayliss, & Ohan, in submission). The CSVQ was developed based on the Social Vulnerability Scale for older adults (Pinsker, Stone, Pachana, & Greenspan, 2006), and is a 15-item measure of a child's vulnerability in everyday social situations (e.g., "My child believes everything kids tell him/her."). Items are rated on a five-point scale, from 1 ('never or very rarely') to 5 ('very often or always'), with higher scores indicating greater social vulnerability. Items are worded to enable ratings by parents and teachers.

Social Experiences Questionnaire (SEQ; Crick & Grotpeter, 1996). The SEQ is a 13-item questionnaire which assesses treatment by peers. The measure yields three subscales: prosocial behaviour (e.g., "Another kid has said something nice to me."), relational victimization (e.g., "Other kids tell lies about me to make other children not like me."), overt victimization (e.g., "Other kids push me."). Internal consistency for the subscales are high (α ≥ .77). For the purposes of the present study, the items were slightly reworded to enable child-, parent-, and teacher-report.

School functioning measures.

Grade satisfaction and school attendance. Grade satisfaction is assessed by a single item asking parents to rate their level of satisfaction with their children's grades in school on a four-point scale, ranging from 1 ("very unsatisfied") to 4 ("very satisfied"). Parents and teachers are also asked to rate the number of times that the child has (i) missed school, (ii) skipped classes, or (iii) arrived late for school over the last 2 weeks (Ray & Margaret, 2003).

Academic Efficacy. This five-item subscale was derived from the Patterns of Adaptive Learning Scales (PALS; Midgley et al., 2000), and assesses the child's perceived capability of completing his/her schoolwork successfully. Items are rated on a five-point scale from 1 ('not at all true') to 5 ('very true'), with higher scores indicating higher levels of academic efficacy.

School Liking and Avoidance Scale (SLAQ; Ladd, 1990; Ladd & Price, 1987). The SLAQ is a child self-report measure that contains nine items assessing school liking (e.g., "Is school fun?"), and five items assessing school avoidance (e.g., "Do you wish you could stay home from school?"). Confirmatory factor analysis has provided support for these two constructs as distinct (Smith, 2011).

Teacher Rating Scale of School Adjustment (TRSSA; Birch & Ladd, 1997). The TRSSA is a teacher-rated questionnaire that contains 52 items pertaining to the

child's adjustment and behaviour in the classroom. Teachers rate their perceptions of the frequency of the child's behaviours across five domains - cooperative participation, self-directedness (or independent participation), school liking, school avoidance, and child's comfort with the teacher (αs ≥ .74). Items are rated on a three-point scale from 0 ('doesn't apply') to 2 ('certainly applies').

Academic Performance Rating Scale (APRS; DuPaul, Rapport, & Perriello, 1991). The APRS is a 19-item teacher-rated scale that assesses teachers' perceptions of their student's academic performance over the last week, including the amount and quality of completed work, attentiveness and ability to follow instructions. Higher scores indicate higher academic performance. The APRS showed sound internal consistency (α = .95) and two-week test-retest reliability (r = .95).

PROCEDURE

Assessments. Assessments and therapy sessions were conducted at one of two university clinical psychology training clinics in Western Australia. Eligible families were invited to attend waitlist and pre-group assessments. Families returned to the clinic to complete post-group and follow-up assessments, with a few of them opting to complete the questionnaires at home and then return by mail to minimize travel times. During the assessment sessions, a clinical psychology trainee met with the child and parent(s) together initially to explain the treatment program, or provide information about the purpose of the assessments. Following this, the child stayed with the therapist to complete the child measures with the therapist's assistance, while the parent completed the parent measures independently. At the pre-assessment session, families were informed to continue 'treatment-as-usual,' that is, to maintain their current treatment regime (including medications) for the duration of

the group program. No families were engaged in other forms of psychological therapy outside of group throughout the trial.

Once assent and consent were obtained from families at the pre-group assessment, the child's teacher was contacted via the school principal, and provided the school principal gave consent, the teacher was invited to complete online questionnaires at pre-treatment, post-treatment and at 6-week follow-up.

Treatment program. The treatment program delivered for this trial was a slight modification of the Cool Kids Child Anxiety Program Adaptation for ASD, developed by Chalfant et al. (2011). The original program comprised 12 group sessions, with the first nine sessions scheduled on weekly basis, followed by three monthly booster sessions. The current trial condensed the program content into ten 1.5-hour group sessions delivered weekly, to fit within the 10-week school terms. This was done to maximise family participation for the full program duration, and minimise family burden. In accordance with the Cool Kids model, groups for children and parents were generally held separately, with each group session including some family-together time. Group topics followed a traditional CBT framework, including breathing and relaxation exercises, generating helpful thoughts, developing exposure hierarchies, problem-solving, and between-session exposure tasks. The groups in the current study comprised three to five families, and were co-facilitated by clinical psychology trainees currently enrolled in an MPsych program. Weekly supervision was provided by experienced child clinical psychologists to ensure treatment adherence and to troubleshoot difficulties in therapy.

Teacher intervention. Teachers in the teacher intervention condition were offered a 1-hour school visit midway through the treatment program. The appointment was offered at a time and place convenient to the teacher. For the consenting and interested teachers, the teacher visit was conducted by one of the

group co-facilitators, and was aimed at providing psychoeducation about anxiety and information about the skills the child has learnt in the program. Teachers were introduced to 1) signs of anxiety versus misbehaviour, 2) using the worry scale to assist the child in tuning in to his/her worries in the classroom, 3) and the role of relaxation techniques, helpful thoughts, and exposure tasks in cognitive-behavioural treatment for anxiety. Teachers were also encouraged to think about how they could encourage their student to utilize some of these skills (e.g., "Cool Breathing") when he/she feels anxious in class. This school visit was followed by a 15- to 30-minute telephone consultation 2 weeks later, again arranged at a time convenient to the teacher, to review the teacher's reflections on their student's anxiety and ways in which they may have tried to support skills use, and to clarify any questions. The treatment program and teacher intervention were provided at no cost to families and schools.

Results.

ASSIGNMENT TO CONDITIONS AND CLINIC SITES

SCARED-P screening scores did not significantly differ between the immediate treatment condition (M = 46.80, SD = 11.88) and the waitlist condition (M = 47.86, SD = 14.61), $t(22)$ = -0.19, p = .85, d = 0.08. SCAS-P scores for immediate treatment (M = 43.40, SD = 11.35) also did not significantly differ from the waitlist condition (M = 44.43, SD = 15.64), $t(22)$ = -0.18, p = .86, d = 0.08.

There was also no significant difference in SCARED-P screening scores between children assigned to the teacher intervention condition (M = 50.33, SD = 14.56) and to the control condition (no teacher intervention; M = 44.50, SD = 11.74), $t(22)$ = -1.08, p = .29, d = 0.44. However, despite randomised assignment, pre-treatment SCAS-P scores were significantly higher in the teacher intervention condition (M = 49.67, SD = 13.24) than the control condition (M = 38.33, SD = 12.23), $t(22)$ = -2.18, p < .05, d = 0.89.

SCARED-P, $t(22)$ = 1.40, p = .18, d = 0.56, and pre-treatment SCAS-P scores, $t(22)$ = 1.30, p = .21, d = 0.52, did not significantly differ between the two clinics.

ATTRITION RATES

Eighteen families completed the treatment program, yielding a 25% attrition rate for the current program. Children who dropped out of the program had slightly higher anxiety scores than children who completed treatment, though these differences were not significantly different based on the SCARED-P, $t(22)$ = -0.83, p = .42, d = 0.43, and the SCAS-P, $t(22)$ = -1.03, p = .31, d = 0.56. Fourteen families (58% intent-to-treat; 78% efficacy) completed follow-up measures.

Treatment Outcomes

Descriptive statistics for scores on the parent- and child-reported questionnaires are shown in Tables 2 and 3 respectively. All scores were within three standard deviations of the mean, and visual inspection of histograms indicated largely normal distributions.

To assess for change in anxiety whilst on the waitlist, we tested for differences between assessments at the beginning of the waitlist and immediately before starting treatment. These participants showed no significant change between the waitlist and pre-treatment assessments on anxiety measures, SCAS-P, $F(1,8) = 0.31$, $p = .59$, $\eta_p^2 = .04$; and SCAS-C, $F(1,8) = 2.65$, $p = .14$, $\eta_p^2 = .25$, or life interference measures – CALIS-P, $F(1,8) = 0.36$, $p = .57$, $\eta_p^2 = .04$; CALIS-C subscales, Fs ≤ 0.89, ps ≥ .37, $\eta_p^2 ≤ 0.10$.

As there was no change in anxiety levels for participants in the waitlist condition, participants' in both the immediate treatment and waitlist conditions were treated as one group in further analyses. Families and teachers completed the follow-up measures between 6 to 10 weeks post-treatment. Repeated measures analyses of variance (ANOVAs) were conducted, with repeated measures contrasts reported where relevant.

Table 2. *Mean scores (and standard deviations) for parent questionnaires.*

Questionnaire	Pre-treatment (*n* = 24)	Post-treatment (*n* = 18)	Follow-up (*n* = 14)
SCAS-P	44.00 (13.74)	34.81 (15.17)	35.00 (20.40)
CALIS-Parent (Total)	39.54 (10.43)	34.42 (11.92)	33.57 (15.75)
Mood and Feelings (MFQ-P)	9.50 (5.12)	6.61 (4.68)	7.11 (4.01)
Social Skills (SSQ)	30.77 (10.38)	33.58 (11.16)	31.86 (13.08)
Social Vulnerability (CSVQ)	49.31 (12.33)	41.28 (12.09)	45.43 (9.25)
Social Experiences (SEQ-P)			
Prosocial behaviour	16.73 (5.53)	18.12 (5.19)	16.69 (4.13)
Relational victimization	12.35 (5.91)	10.12 (5.48)	12.50 (4.88)
Overt victimization	5.71 (2.93)	4.61 (1.69)	4.93 (1.94)

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Table 3. *Mean scores (standard deviations) for child questionnaires.*

Questionnaire	Pre-treatment (n = 23)	Post-treatment (n = 18)	Follow-up (n = 14)
SCAS-C	32.09 (18.85)	26.86 (18.03)	24.46 (18.28)
CALIS-Child			
At home	5.67 (3.82)	4.12 (3.43)	3.71 (3.89)
Outside of home	4.57 (3.80)	4.28 (3.75)	3.50 (4.16)
Mood and Feelings (MFQ-C)	4.87 (3.39)	3.25 (3.14)	4.29 (2.73)
Academic self-efficacy	16.96 (5.00)	18.33 (5.46)	18.36 (5.60)
SLAQ			
School liking	31.00 (9.77)	30.72 (11.95)	32.65 (11.96)
School avoidance	17.61 (6.23)	17.50 (5.28)	15.00 (5.66)
Social Experiences (SEQ-C)			
Prosocial behaviour	19.68 (4.79)	20.53 (5.04)	20.46 (4.84)
Relational victimization	8.62 (4.74)	8.76 (5.53)	7.92 (5.72)
Overt victimization	4.17 (1.95)	5.41 (3.95)	3.86 (1.83)

AutismCRC

Anxiety and depression. For the sample of children who completed the treatment program ($n = 18$), there were large, significant reductions in SCAS-P scores from pre- to post-treatment, $F(1,17) = 10.58$, $p < .01$, $\eta_p^2 = .38$. There were also large, significant reductions in CALIS-P, $F(1,17) = 6.42$, $p < .05$, $\eta_p^2 = .27$, and MFQ scores, $F(1,17) = 4.84$, $p < .05$, $\eta_p^2 = .22$. When 8-week follow-up scores were included in the analyses, there was a significant effect of time on SCAS-P scores, $F(2,24) = 9.55$, $p < .01$, $\eta_p^2 = .44$, and CALIS-P scores, $F(2,24) = 3.37$, $p = .05$, $\eta_p^2 = .22$. Repeated measures contrasts revealed a significant decrease in SCAS-P scores between pre- and post-treatment, $F(1,12) = 11.90$, $p < .01$, $\eta_p^2 = .50$, but no significant change between post-treatment and follow-up, $F(1,12) = 0.01$, $p = .94$, $\eta_p^2 = .001$. However, there was no significant change for the CALIS-P between pre- and post-treatment, $F(1,12) = 3.42$, $p = .09$, $\eta_p^2 = .22$, and between post-treatment and follow-up, $F(1,12) = 0.08$, $p = .78$, $\eta_p^2 = .01$.

While the child-rated anxiety and depression questionnaires showed improvements over time, none of these changes were significant, $Fs \leq 2.95$, $ps \geq .10$, $\eta_p^2 \leq 0.15$.

Social functioning. Parents rated a large, significant reduction in children's social vulnerability as indicated by CSVQ scores from pre- to post-treatment, $F(1,17) = 6.49$, $p < .05$, $\eta_p^2 = .28$, although this difference was no longer significant at the 8-week follow-up, $p > .25$. There were no significant pre- to post- treatment changes in parent-rated social skills on the SSQ, $F(1,17) = 3.03$, $p = .10$, $\eta_p^2 = .15$; or pre- to post- treatment changes in parent-rated social experiences on the SEQ-P subscales, $Fs \leq 0.96$, $ps \geq .34$, $\eta_p^2 \leq 0.06$. Similarly, children reported no pre-to-post changes in their social experiences of positive peer interactions or bullying on the SEQ-C subscales, $Fs \leq 3.04$, $ps \geq .10$, $\eta_p^2 \leq 0.16$.

School functioning. There were no significant effects of treatment on parent-rated satisfaction with their child's school grades, or on parent-rated frequency of skipping classes or arriving late for school, all ps > .24. However, there was a significant reduction in the number of times their child missed school over the past 2 school weeks at post-treatment relative to pre-treatment. Children did not report significant pre- to post- treatment changes in their academic self-efficacy scores, $F(1,17) = 0.51$, $p = .49$, $\eta_p^2 = .03$, or in their levels of school liking, $F(1,17) = 1.07$, $p = .32$, $\eta_p^2 = .06$, and school avoidance, $F(1,17) = 1.87$, $p = .19$, $\eta_p^2 = .10$.

Teacher Intervention

Six of 12 teachers accepted the offer for the teacher intervention, and only three of those teachers completed the pre- and post-treatment questionnaires. Eight teachers in the no teacher intervention completed pre- and post-treatment questionnaires, and two of these teachers completed follow-up questionnaires. Due to the small number of teachers who participated, and the incomplete dataset, further statistical analyses could not be conducted to evaluate the effectiveness of the teacher intervention over and above the effectiveness of the Cool Kids treatment program.

Discussion.

Succeeding at school is crucial to children on the autism spectrum; however, many children on the autism spectrum experience anxiety at school that limits their ability to learn and achieve. The broad purpose of our investigation was to test if participating in a group anxiety CBT program assists children on the spectrum to function better at school, and if including a brief teacher intervention increases benefits for children. Specifically, our aims were three-fold: 1) to replicate the impact of a group CBT program in decreasing anxiety in children on the autism spectrum and comorbid high anxiety, 2) to investigate if these benefits extend to decreases in related problems, including mood, social interactions, and, most crucially, school functioning; and 3) to investigate if including a brief teacher component boosts the benefits of the standard CBT program.

In the present study, delivery of a cognitive-behavioural group treatment program for anxiety was associated with significant reductions in the primary outcome of interest; that is, anxiety and level of anxiety interference in daily life functioning as reported by parents. The parent-reported improvements in anxiety and reductions in life interference were also maintained at the 8-week follow-up, suggesting stable maintenance of gains. The large size of most of these effects echo those found in the literature (e.g., Chalfant et al., 2007; Fuiji et al., 2013; Reaven et al., 2012), and provide further support for the effectiveness of cognitive-behavioural therapy in managing anxiety for children on the spectrum. That such outcomes were achieved within a small group treatment setting rather than individual format often included in previous studies (e.g., Wood et al., 2009) may also point to greater cost effectiveness.

However, large effects were not noted on children's reports of their own anxiety. Although we did observe some decreases in child reports of anxiety, these were not statistically significant and do not mirror those found in parents' reports. Although contrary to results reported by Chalfant et al. (2007), this is consistent with Wood et al. (2009), who also found large decreases in parents' but non-significant differences in children's anxiety reports. Discrepancies between parent and child report is not unusual in the child and adolescent literature (Nauta et al., 2004; Reavens et al., 2009). Nauta and colleagues (2004) found that child and parent concordance was typically higher for observable anxiety behaviours, which may pose difficulties in assessment due to the internalizing nature of anxiety. The discrepancies in child and parent ratings call to question whether children on the spectrum may under-report their levels of anxiety due to lack of insight and awareness, social desirability, or avoidance (particularly if they know the purpose of the assessment is linked to further treatment of anxiety). It also raises psychometric issues about the suitability and validity of available child anxiety measures for children on the spectrum. Indeed, anecdotal feedback from parents within the groups has been that their children do not verbalize their anxiety frequently, and if they do, it does not always match the kinds of symptoms that the questionnaires ask about. Several studies (Grondhuis & Aman, 2012; Wigham & McConachie, 2014) have identified child anxiety measures that have robust psychometric properties when administered with children on the spectrum. However, due to the highly co-occurring sensorimotor, socio-cognitive, emotional, and behavioural difficulties in children on the spectrum, further investigation may be necessary to explore whether different measures may be required to adequately assess for anxiety. Failure of measures to detect anxiety in children on the spectrum who have significant clinical anxiety can lead to greater impairment in life functioning and impede intervention efforts.

Our study also found that improvements extended to depressive symptomatology, which is in line with Chalfant et al.'s (2007) findings of lower overall emotional symptoms, and internalizing self-esteem cognitions. This may suggest some generalization of CBT skills from anxiety-related to depression-related concerns, or perhaps improved mood and sense of self through the lesser impact of anxiety on life functioning. This indication that group CBT for anxiety may have a more general benefit to internalising symptoms is further evidence for its utility in this population. In addition to improvements in mood, there was also some evidence of reduction in children's social vulnerabilities at post-treatment as reported by parents, but no change in social skills or social experiences with peers as reported by parents and children. The Cool Kids ASD adaptation included a brief section on shaping social skills that may be necessary to increase success at exposure tasks (e.g., maintaining eye contact, communicating assertively to make a request). Thus, this novel finding of decreased social vulnerability is interesting and warrants future replication. Given the considerable social and school difficulties that children on the spectrum are at higher risk of facing (Simonoff et al., 2008; Wood & Gadow, 2010), possible improvements in children's ability to understand and navigate social interactions with peers would help to buffer against these challenges and increase personal efficacy.

However, parents' reports of social skills and victimisation did not differ with treatment, suggesting that the benefits of anxiety therapy do not extend this far. Although groups included some indirect discussion of social interactions, especially insofar as they relate to experiences of anxiety (e.g., talking to others, working as part of a group at school, performing in front of others), no formal social skills training was undertaken. Given that social skills are part of the core symptoms of ASDs (APA, 2013), this area is likely to need more intensive treatment. Perhaps

incorporating more intensive social skills training as an adjunct to anxiety treatment may enhance the effects noticed on social vulnerability, and possibly lead to greater social skills and more positive peer experiences in the longer-term.

A novel feature of the current treatment program was the proposed addition of a brief teacher component, in recognition of the potential role that teachers can play in supporting the child to manage his/her anxiety at school. Unfortunately, due to the small number of teachers who participated in the teacher intervention ($n = 6$) and the incomplete dataset, we were unable to conduct statistical analyses to evaluate whether the additional teacher component extended the benefits of standard treatment. Based on parent and child measures, providing standard anxiety treatment, with some teachers receiving a brief teacher visit and follow-up telephone consultation, did not have a significant impact on parent-rated satisfaction with academic performance, frequency of skipping classes or arriving late for school. There was also no significant impact on children's academic efficacy, or their levels of school liking or avoidance. However, a significant reduction in the number of times children missed school over the past two school weeks was found between pre- and post- treatment. Should this finding be replicated, it could have substantial implications on the quantity and quality of school participation, and correspond to the reductions in life interference on major areas of functioning observed for children on the spectrum. Indeed, steps to support children on the spectrum and anxiety to overcome school-related anxieties are likely to increase children's and parents' satisfaction and quality of life. It may also minimize the level of ongoing intervention required by teachers and school administrators, leading to efficient and effective classroom environments.

Delivery of the present treatment program was not strictly controlled or randomized, which may make it difficult to attribute all observed changes definitively

to the Cool Kids intervention. However, differences between waitlist and immediate treatment conditions were minimal. Furthermore, our assignment to waitlist or immediate treatment was based on order in which families could be scheduled for an assessment, which is a close reflection of treatment provision within naturalistic settings. A second limitation was the limited participant sample. Although the number of participants was sufficient to observe significance with large effects, the sample was not sufficient to determine moderate to small effects that may have been evident. Finally, perhaps the most notable limitation is with the size of the teacher groups. Despite efforts to keep demands of participation minimal (e.g., holding therapy at school at a convenient time) and to eliminate costs of the therapy, few of the teachers invited to participate in the intervention did so. While no formal data were collected on reasons for declining participation, the low participation rates of schools likely reflects the lack of resources available to teachers and schools to undertake these extra-curricular activities on top of their teaching and administrative load. This indicates that efforts to boost and extend the effectiveness of CBT for anxiety beyond the home and into the classroom via a brief teacher intervention component are unlikely to be successful by including individual appointments with teachers. Given the many hours of a child's life that are spent at school, future research will need to address the need to incorporate adjustment at school in their anxiety treatment programs if they are to foster the educational success of children on the autism spectrum, as these children commonly experience anxiety at school. Future studies may wish to consider broader targets (e.g., all teachers at a school, or all teachers within specific year grades) to increase time- and cost-effectiveness of school-based interventions. Moreover, given that CBT for anxiety with typically developing youth generalises to decreased anxiety at school, it may be that CBT programs for this population need to be re-written to better emphasise school and

strategy use at school in order to help children generalise the skills they are learning. Further empirical investigation is also necessary to identify what information and techniques are most beneficial for inclusion within a teacher intervention program for anxiety.

CONCLUSIONS

Findings from the present study provide additional support for the effectiveness of group CBT for children on the spectrum and anxiety, observed at post-treatment and maintained at 8 weeks post-treatment. These effects extend to non-anxiety related measures such as depression, children's social vulnerability, and school attendance. However, beyond school attendance, no further benefits were seen to children's school functioning, and our attempts to incorporate a teacher component to the intervention were not successful. Still, the role of schools in supporting children on the spectrum and anxiety to navigate challenging social and academic situations is vital, and may be mined by enlisting their help to identify symptoms or anxiety and implement anxiety management strategies within the classroom. This is a much-needed area of research, and may inform effective school-based programs for children on the spectrum and anxiety.

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