

A randomised controlled trial of a CBT intervention for anxiety in children with Asperger syndrome

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Background: The aim of the study was to evaluate the effectiveness of a brief CBT intervention for anxiety with children diagnosed with Asperger syndrome (AS). A second interest was to evaluate whether more intensive parent involvement would increase the child's ability to manage anxiety outside of the clinic setting. **Methods:** Seventy-one children aged ten to twelve years were recruited to participate in the anxiety programme. All children were diagnosed with AS and the presence of anxiety symptoms was accepted on parent report via brief interview. Children were randomly assigned to one of three conditions: intervention for child only, intervention for child and parent, wait-list control. **Results:** The two intervention groups demonstrated significant decreases in parent-reported anxiety symptoms at follow-up and a significant increase in the child's ability to generate positive strategies in an anxiety-provoking situation. There were a number of significant differences between the two interventions to suggest parent involvement as beneficial. **Conclusions:** The sample of children with AS in this study presented with a profile of anxiety similar to a sample of clinically diagnosed anxious children. The intervention was endorsed by parents as a useful programme for children diagnosed with Asperger syndrome and exhibiting anxiety symptoms, and active parent involvement enhanced the usefulness of the programme. Limitations of the study and future research are discussed. **Keywords:** Asperger syndrome, anxiety, CBT, parent involvement. **Abbreviation:** SCAS-P: Spence Child Anxiety Scale – Parent.

Since the term 'Asperger syndrome' was first introduced by Lorna Wing in 1981, interest in the disorder has generated an increasing body of research, and a corresponding growth in articles and books on the subject (e.g., Attwood, 1998; Frith, 1991; Howlin, 1998; Ozonoff, Dawson, & McPartland, 2002; Schopler, Mesibov, & Kunce, 1998). However, whilst much has been written about the disorder, very little has been produced in terms of sound evidence-based interventions for the population.

Asperger syndrome (AS) is characterised as a disorder primarily involving socio-emotional difficulties (Frith, 1991). Social deficits are evident and attempts made in social contexts are often clumsy and inappropriate (Wing, 1981, 1991). Whilst verbal expression can be fluent, the content of conversations may be narrow and reflect circumscribed interests and the child may continue a conversation with little regard for the interest of the listener. The child may be motivated to form friendships but is unlikely to possess the skills to succeed (Happé & Frith, 1996; Myles & Simpson, 2002). The inability to read social cues and to respond to these is usually a central deficit. There is likely to be a preference for fixed routines and structure, with significant distress at even minor changes. There can be signs of motor clumsiness, problems with handwriting and hypersensitivity to specific auditory and tactile experiences. There can also be problems with organisational and time management skills (Attwood, 1998).

Anxiety and Asperger syndrome

The DSM-IV-TR description of Asperger syndrome includes reference to an association between the disorder and secondary mood disorders, especially anxiety disorders (American Psychiatric Association, 2000). Whilst few studies have focused solely on anxiety, Kim, Szatmari, Bryson, Streiner, and Wilson (2000) evaluated the rate of mood disorders and anxiety in a cohort of children diagnosed with High Functioning Autism (HFA) and AS compared with a community sample. Using parent report, they found elevated rates of both mood disorders and anxiety in children with HFA and AS, with 16.9% reporting depressive symptoms at least two standard deviations above the general population mean, 13.6% reporting generalised anxiety at this level and 8.5% reporting separation anxiety at this level. Furthermore, children with anxiety and mood problems were also rated as more aggressive, more demanding of parents and as having poorer relationships with peers and teachers.

Another study that examined psychiatric functioning in young adolescents with AS found that compared to a group of adolescents with conduct disorder, the young people with AS showed significantly greater levels of anxiety symptoms such as worrying, hypochondriasis, nonsituational anxiety or panic, and specific fears (Green, Gilchrist, Burton, & Cox, 2000).

In their everyday lives, children with AS experience difficulties with social reasoning and friendships, Theory of Mind abilities, empathy and the pragmatic aspects of language. They are also more likely to have a specific learning disability and heightened sensory awareness, which can result in significant levels of stress likely to contribute to anxiety. These deficits provide illustration of the struggle children face in navigating their day-to-day world and it may be, as suggested by Kim et al. (2000), that interventions aimed at reducing anxiety for children with AS may also reduce aggression and thereby enhance functioning and improve relationships with family, peers and teachers.

Cognitive Behaviour Therapy and Asperger syndrome

Strategies initially developed for children with autism have been used with some success with an AS population (e.g., Social Stories and Comic Strip Conversations; Gray, 1998). The intervention developed for this study, whilst incorporating those strategies, was developed specifically for children with AS and has its basis in the sound theoretical framework of Cognitive Behaviour Therapy (CBT). As outlined by Attwood (2003), it is necessary to accommodate the cognitive profile of the child with AS when conducting CBT and to modify the approach to achieve this. CBT for typical children with anxiety has been refined and evaluated over several decades (Graham, 1998; Kendall, 2000) but has only recently been applied to children and adults with AS (Hare & Paine, 1997).

Although few empirical studies have been reported, outcomes have been positive. A recent case-study demonstrated good results from a CBT approach with obsessive-compulsive disorder in a young girl with AS (Reaven & Hepburn, 2003). Researchers conducting a CBT intervention to facilitate social-emotional understanding and to increase social interaction in children with HFA were also able to demonstrate significant improvement in positive social interaction, emotional understanding and social problem-solving (Bauminger, 2002).

Parental involvement

There is a body of literature that focuses on the role of parental involvement in the treatment of childhood anxiety. Kendall and Choudhury (2003), in a review paper, stress the importance of parent involvement and the need to accommodate developmental differences when using CBT with children. Mendlowitz et al. (1999) found that a combined child + parent group demonstrated improvement relative to a child-only condition in increased use of adaptive coping strategies in the child. Barrett, Dadds, and Rapee (1996) also found a significant difference between child-only and child + family groups, with the

combined group showing greater improvement on a number of measures. At 6-year follow-up, treatment gains were maintained, with little difference between the two groups (Barrett, Duffy, Dadds, & Rapee, 2001). It is considered important to evaluate the outcome for both child-only and child + parent involvement for the AS population using a model similar to that of the Barrett et al. studies, that is, training parents as co-therapists. Given the difficulty for a child with AS to generalise material learned from one context to another, it is expected that increased parental involvement will result in a better outcome for the child, especially in use of strategies.

The aim of the current intervention is to work with children with AS who are experiencing anxiety, to teach them effective strategies to manage feelings and to encourage a broadening of their emotional and behavioural repertoire. In the present study, the questions of interest are whether a brief CBT intervention for anxiety is effective in reducing symptomatology in children diagnosed with AS and whether there is a significant effect of parent involvement in the intervention.

Method and procedures

Participants

Seventy-one children, aged 10 to 12 years, were recruited to participate in the 6-week intervention. Participants were recruited via local newspapers, radio and the Asperger Syndrome Support Network newsletter. All children included in the study had a primary diagnosis of AS from a paediatrician. A semi-structured phone interview with a parent was used to establish DSM-IV criteria and a further check, the Childhood Asperger Syndrome Test with items based on DSM-IV criteria (CAST; Scott, Baron-Cohen, Bolton, & Brayne, 2002), was included in the initial questionnaire battery. The primary distinction between a diagnosis of AS and High Functioning Autism is based on whether the child had a significant language delay before the age of 3 years. Whilst no parents in the current study reported significant language delay, five children did not meet the symptom score on the CAST (>15) and, although they participated in the intervention, their data were excluded from analyses. Parents were asked about additional diagnoses but no children were excluded on the basis of comorbid disorders.

The presence of child anxiety was established via parent report at the initial phone interview when parents were asked a series of questions to operationalise symptomatology. Parents completed consent forms and children gave assent to participation. Families were randomly assigned to Intervention 1 (child only), Intervention 2 (child + parent) or wait-list following receipt of consent forms. Children were allocated to groups of three within each intervention by age and sex, with girls grouped together. There were no significant differences among groups at pre-intervention. See Table 1 for demographic details of the sample. Intervention 1 and the wait-list group ran concurrently and Intervention 2

Table 1 Child demographics described across intervention groups

Group	Age	Child anxiety (SCAS)	IQ	CDI	CAST
Intervention 1 (child only)					
N = 23 (+2 non AS participants)*					
Boys = 20; Girls = 3					
ADHD = 10; Depression = 2					
Mean	10.56	29.29	107.5	11.50	21.59
Std. dev.	.99	17.45	27.3	8.27	4.3
Minimum	9.00	6.00	90	1.00	15
Maximum	12.00	78.00	137	30.00	27
Wait-list group					
N = 23					
Boys = 20; Girls = 3					
ADHD = 8; Depression = 1					
Mean	10.75	27.46	101.0	8.62	20.46
Std. dev.	1.04	12.19	27.2	5.80	3.3
Minimum	9.00	2.00	95	2.00	15
Maximum	12.00	49.00	125	21.00	25
Intervention 2 (child + parents)					
N = 25 (+3 non-AS participants)*					
Boys = 22; Girls = 3					
ADHD = 12; Depression = 3					
Mean	10.54	32.23	105.6	10.25	20.71
Std. dev.	1.26	17.71	21.2	7.82	3.8
Minimum	9.00	6.00	90	1.00	15
Maximum	12.00	91.00	135	25.00	25

SCAS = Spence Children's Anxiety Scale (Spence, 1995).

IQ = Short form WISC-III, 3 verbal + 3 performance subscales prorated.

CDI = Children's Depression Inventory (Kovacs, 1992).

*Data was not included from non-AS participants.

Table 2 Parent ratings of anxiety in children with Asperger syndrome, clinically anxious children and a non-clinical sample

SCAS-P Ratings	AS sample (data from current sample)	Clinical sample (data from Nauta et al.)	Non-clinical sample (data from Nauta et al.)
Total score	37.30**	31.90	14.2
Panic/Agrophobia	4.30	3.2	0.8
OCD	5.10**	3.0	1.1
Social phobia	8.03	7.7	4.2
Physical injury	5.43*	4.5	2.8
Separation anx.	7.35	6.9	2.6
GAD	7.09	6.6	2.7

*significantly higher than clinical sample, $p < .05$.

**significantly higher than clinical sample, $p < .001$.

began immediately following completion of Intervention 1. The wait-list group completed the intervention (child + parent) following their final data collection. Fifteen families participated and their results were very similar to Intervention 2.

Independent groups t -tests were used to compare scores on the SCAS-P from the children with AS, children diagnosed as clinically anxious, and normally developing children. The clinically anxious and comparison samples were taken from Nauta et al. (2004). The purpose of the preliminary analysis was to provide descriptive data on the type and severity of anxiety reported by parents of the children in the current study. Results showed significant differences between the AS group and the normal sample but also significant differences between the AS group and the clinically anxious children on the OCD subscale and the physical injury fears subscale, with the AS group reporting significantly higher scores (see Table 2).

Procedure

The therapists conducting the child groups were post-graduate students enrolled in the clinical psychology programme at the University of Queensland who were completing their second internship. All therapists participated in a one-day training workshop prior to commencing the intervention, worked from a therapist's manual and received weekly supervision. Ethical approval for the study was gained from the University of Queensland ethics committee in accordance with standards required by the National Health and Medical Research Council of Australia.

In Intervention 1 (child only), eight groups were formed. Each group comprised three children and two therapists. Parents received no training but after each session met briefly with therapists to access feedback on the child's participation in sessions and to be told about the weekly home-based projects.

In Intervention 2 (child + parents), there were 9 groups of three children each with two therapists. Parents from this intervention formed two 'parent groups' and a therapist trained parents to work as co-therapists in all components of the intervention. They were asked to encourage and coach use of strategies in different situations and to encourage completion of the home-based projects.

Measures

The first measure, 'James and The Maths Test' (Attwood, 2002), required each child to generate strategies for 'James' to cope with anxiety in the situation outlined (see Appendix A). Administration was standardized, with the scenario read aloud to each child and responses recorded by a therapist.

The second questionnaire, a parent-report measure of child anxiety, the Spence Child Anxiety Scale – Parent (SCAS-P, Nauta et al., 2004), contains 39 questions relating to situations in which a child could experience feelings of anxiety, and parents indicate on a scale (0–3) how applicable the feelings would be to their child. The scale yields a total score and six subscales, Generalised Anxiety Disorder (GAD), Obsessive Compulsive Disorder (OCD), Specific Phobia (SP), Panic and Agoraphobia (PA), Separation Anxiety Disorder (SAD), Social Anxiety (SA). The total scale demonstrated high internal validity with this population (Cronbach's Alpha .92) and internal reliability coefficients for the six subscales ranged from adequate to excellent (.61 for physical injury fears to .81 for panic and agoraphobia).

The child version of this measure was used at pre-intervention and these scores appear in Table 1. Significant difficulty was experienced gaining anxiety-related information from child informants and as other authors have noted similar difficulty in accessing and reporting emotions in this population (Capps, Yirmiya, & Sigman, 1992), it was decided not to retain this measure at post or follow-up.

The third measure was a parent-report measure gauging the level of social worry experienced by the child, the Social Worries Questionnaire-Parent (Spence, 1995). The questionnaire consists of 10 questions relating to feelings of worry in a range of social situations and asks parents to rate (0–2) how true these feelings have been for their child in the previous four weeks. The scale yields a total score taken across the behaviours nominated to have occurred. The scale demonstrated good internal reliability, with a coefficient alpha of .82 for the population in this study.

Measures were administered on three occasions, pre-intervention (Time 1), immediately post-intervention (Time 2) and at six-week follow-up (Time 3).

Scoring

James and the Maths Test was scored by allocating 1 point for each positive strategy generated. Scoring was checked for inter-rater reliability using independent raters blind to the child's intervention condition (wait-list vs. intervention 1 or 2). The reliability check found 99% agreement between raters.

Materials

Therapists conducting the sessions followed the format outlined in the Trainer's manual and completed checklists indicating components of the session that had been covered. Twenty-five percent of sessions were videotaped and independent raters viewed these to assess content fidelity. Approximately 98% of the material was found to have been accurately covered within the sessions.

Intervention

The CBT programme was designed to be highly structured, informative and entertaining. Every child received a workbook and materials for the six two-hour sessions that included information on being happy, relaxed and anxious, with space for individual comments and responses to questions. At the end of each session, a project was explained to participants and the completed project was discussed within the group at the start of the next session. A metaphor was created of the child as scientist or astronaut exploring a new planet. The authors had noted that children with AS, within the age range of ten to twelve years (and predominantly boys), often have a special interest in science and science fiction.

Session one explored two positive emotions, happiness and relaxation, with a range of group and individual activities to measure and compare emotions in specific situations. Session two was an exploration of anxiety and recognition of the changes that occur in physiology, thinking, behaviour and speech. The concept of a 'tool box' with different types of tools to 'fix the feeling' was explained, with a focus on physical tools that provide a constructive release of emotional energy (e.g., going for a run or bouncing on the trampoline), and relaxation tools that lower the heart rate (e.g., listening to music or reading a book). Session three explored social tools; for example, how other people can help restore positive feelings through words, gestures of reassurance and affection or how avoiding social contact, solitude, can be an effective emotional restorative for children and adults with Asperger syndrome. Also explored in session three were thinking tools, a category of activities or thoughts that test the reality and probability of feared outcomes. In session four participants discovered a range of measures of the degrees of emotion, with some time spent exploring the concept of a 'thermometer'. Group discussion then explored how each participant could share strategies or tools to successfully manage their anxiety. In session five, participants explored how Social Stories (Gray, 1998) can be used for emotion management, and the concept of creating an 'antidote' to poisonous or noxious thoughts. In the final session, the participants worked together designing a programme for each participant to improve their management of anxiety.

Results

Preliminary analyses revealed that the distribution was normal and homogeneous with no missing data. Five children failed to complete the intervention, one

child from Intervention 1, three from the wait-list group, and one from Intervention 2. ANOVA showed no significant differences between completers and noncompleters on any measure. A Bonferroni adjustment was used with all analyses to take into account the number of analyses conducted.

Parent reports of anxiety – SCAS-P

A series of repeated measures analyses of variance was conducted to compare parent reports of child anxiety across time (T1 pre-intervention, T2 post-intervention and T3 follow-up) and between groups (Intervention 1 (child only), Intervention 2 (child + parent), and wait-list control group). Analyses were conducted for the total scale and for the six subscales.

Results from the total score of the SCAS-P showed a significant main effect for Time, $F(2,78) = 38.95$, $p < .0001$. There was also a significant Time $\times$ Group interaction, $F(4,158) = 9.16$, $p < .0001$. Post-hoc comparisons of the simple effects showed that scores on the SCAS-P for the two intervention groups were significantly different from Time 1 to Time 3 at $p < .0001$, such that parents reported fewer anxious symptoms at Time 3. There was also a significant

difference between the two intervention groups at Time 3 ($p < .025$), with the combined group (child + parent) showing greater improvement.

The separation anxiety subscale showed a main effect for Time, $F(2,78) = 11.34$, $p < .0001$ and a main effect for Group, $F(2,79) = 5.24$, $p < .01$. There was also a significant Time $\times$ Group interaction, $F(4,156) = 11.21$, $p < .0001$. Post-hoc tests showed that there was a significant difference for both Intervention 1 ($p < .01$) and Intervention 2 ($p < .0001$) between Time 1 and Time 3. There were no differences across time for the wait-list group. Whilst there was no difference between groups at Time 1, there was a significant difference between the wait-list group and both Intervention 1 ($p < .02$) and Intervention 2 ($p < .001$) at Time 3 and also between the two intervention groups ($p < .02$), with the combined group showing greater improvement.

Results for the subscales measuring obsessive compulsive tendencies, socially phobic tendencies, and generalised anxiety tendencies also demonstrated main effects for Time and Time by Group interactions such that scores were lower in the intervention groups by follow-up but not in the wait-list group. The means and standard deviations are presented in Table 3.

Table 3 Means and standard deviations for parent reported anxiety scores across time

SCAS-P total	Time 1 Pre	Time 2 Post	Time 3 Follow-up	Significance T1 to T3
Wait-list	36.64 (16.67)	35.61 (13.34)	36.32 (13.3)	
Intervention 1	40.23 (20.42)	36.17 (16.21)	29.42** (15.3)	$p < .01$
Intervention 2	35.25 (16.44)	32.25 (14.56)	21.11 _a ** (10.1)	$p < .01$
Separation Anxiety				
Wait-list	8.18 (4.45)	7.46 (4.52)	8.89 (4.5)	
Intervention 1	7.01 (4.46)	6.59 (3.83)	5.38** (3.7)	$p < .01$
Intervention 2	6.79 (4.71)	5.03* (3.55)	3.03 _b *** (2.2)	$p < .0001$
OCD				
Wait-list	4.96 (4.08)	5.11 (3.86)	5.71 (4.4)	
Intervention 1	5.11 (4.65)	4.09 (3.67)	2.88*** (2.9)	$p < .0001$
Intervention 2	5.21 (3.67)	3.86* (2.58)	2.21*** (1.9)	$p < .0001$
Social phobia				
Wait-list	7.21 (4.75)	8.18 (4.74)	6.61 (4.49)	
Intervention 1	9.03 (4.45)	8.04 (3.78)	7.38* (4.43)	$p < .05$
Intervention 2	7.93 (5.03)	8.50 (4.95)	5.96** (4.32)	$p < .01$
Panic				
Wait-list	4.18 (4.28)	3.25 (3.21)	3.35 (2.7)	
Intervention 1	4.88 (4.67)	3.77 (4.32)	3.31** (3.5)	$p < .01$
Intervention 2	3.89 (2.84)	3.86 (3.35)	2.68* (2.4)	$p < .05$
Personal Injury				
Wait-list	5.54 (3.28)	5.18 (3.44)	5.17 (3.8)	
Intervention 1	5.69 (3.37)	6.17 (3.98)	5.00 (3.9)	
Intervention 2	5.07 (2.97)	5.71 (3.54)	3.32*** (2.2)	$p < .0001$
GAD				
Wait-list	6.57 (3.65)	6.42 (3.19)	6.57 (3.56)	
Intervention 1	8.42 (3.41)	7.50 (3.19)	5.46*** (2.67)	$p < .0001$
Intervention 2	6.36 (3.30)	5.28* (2.53)	3.89*** (2.36)	$p < .0001$

a = significantly different from Intervention 1, $p < .05$.

b = significantly different from Intervention 1, $p < .02$.

*Time 2 significantly different from Time 1, $p < .01$.

**Significantly different from Time 1 at $p < .01$.

***Significantly different from Time 1 at $p < .0001$.

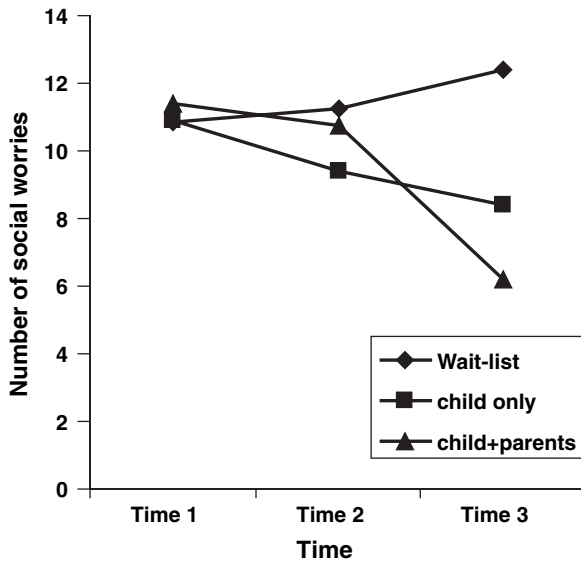


Figure 1 Parent ratings of social worries in their children across time

Parent reports of social worries – SWQ (Spence, 1995)

A repeated measures analysis of variance was conducted on the Social Worries Questionnaire. The results showed a significant main effect for Time, $F(2,78) = 11.86$, $p < .0001$ and a significant Time by Group interaction, $F(4,156) = 11.06$, $p < .0001$. Post-hoc tests showed a significant effect between Time 1 and Time 3 for Intervention 1 (child only), $p < .001$ and for Intervention 2 (child + parents), $p < .0001$, with parents reporting a decreased number of social worries in their children. There was no difference across time for the wait-list group and there was a significant difference between the two intervention groups and the wait-list group at Time 3 – Intervention 1, $p < .01$ and Intervention 2, $p < .0001$. The difference between the two intervention groups approached significance at Time 3, $p = .06$. These results are presented in Figure 1.

James and the Maths Test – strategies generated by children

This analysis evaluated differences over time and between groups for the number of strategies generated in the hypothetical scenario. There was a significant main effect for Time, $F(2,78) = 104.76$, $p < .0001$ and a significant main effect for Group, $F(2, 79) = 38.19$, $p < .0001$. There was a significant Time $\times$ Group interaction, $F(4,158) = 28.31$, $p < .0001$. Significantly more strategies were generated at Time 2, $p < .0001$ and at Time 3, $p < .0001$ in both of the intervention groups compared with Time 1. Whilst there was no difference between groups at Time 1, there was a significant difference between each of the intervention groups and the wait-list group at Time 2, $p < .0001$ and at Time 3, $p < .0001$.

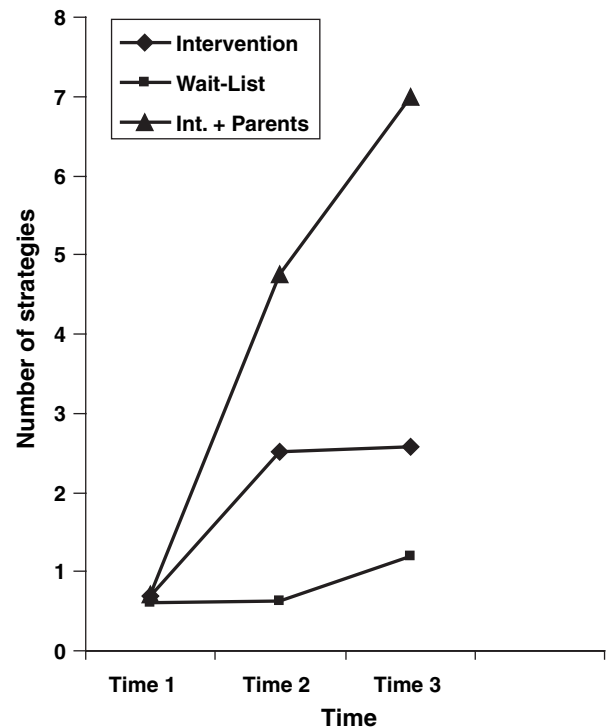


Figure 2 Number of strategies generated by children pre-intervention, post-intervention and at follow-up

There was also a significant difference between Intervention 1 and Intervention 2 at Time 2, $p < .01$ and at Time 3, $p < .0001$, with the combined group generating significantly more strategies. These results appear in Figure 2.

Discussion

One question posed by this study was whether a brief CBT intervention for anxiety would effectively reduce symptomatology in children diagnosed with AS. A second question was whether there would be a positive effect of parent involvement on children's use of the strategies and therefore an increase in effectiveness.

Whilst it is recognised that anxiety is a significant feature in the presentation of many children, there is little written about the nature and extent of anxiety in children diagnosed with AS. The initial comparison between the sample of children with AS and a clinically anxious sample showed that the current sample more closely resembled the clinical sample than the non-clinical sample (see Table 2). These results support the findings outlined in Kim et al. (2000). Furthermore, the children with AS were rated significantly higher by parents than the clinical sample on two of the anxiety subscales, obsessive compulsive tendencies and physical injury fears. Whilst we had expected that the sample would exhibit anxiety, since they were recruited to participate in an anxiety programme, it is nonetheless interesting to note the pattern of anxiety reported by parents.

The higher levels of OCD may be a reflection of the general characteristics of Asperger syndrome (i.e., unusual or repetitive routines or behaviours). Previous literature has suggested that children with AS use their repetitive, ritualistic behaviours as a means of reducing anxiety (Despert, 1965) or that they occur as a consequence of experiencing anxiety (Jolliffe, Landsdown, & Robinson, 1992).

The reason for the higher endorsement of physical injury fears may also be congruent with characteristics of the disorder. Children with AS often experience heightened physical sensitivity to noise and touch and frequently find touch of any kind distressing and threatening (Attwood, 1998). They can become distressed by the normal jostling and activity of the school environment and may interpret this in a negative way. Furthermore, many of these children experience bullying in the school environment (Attwood, in press; Little, 2002) and this may also cause anxiety related to the possibility of physical injury.

Effectiveness of brief CBT with children diagnosed with Asperger syndrome

The results demonstrated that the programme was effective in reducing anxiety symptomatology reported by parents in children diagnosed with AS. The results from the Spence Children's Anxiety Scale – Parent form shows a significant reduction in parent-rated symptoms from pre-intervention to six-week follow-up, both on the total score and on individual subscales. It is important to note the change across the subscales because children presented with a broad range of fears; they were not a homogeneous group. It is also interesting to note that although in some cases there was a significant change from pre-intervention to immediately post-intervention (Time 2), in many cases there was no significant change until the six-week follow-up (Time 3). Whilst it is common in clinical interventions to see a significant change from pre- to post-intervention and then a return closer to baseline by follow-up, this did not occur with the current sample. It seems that the uptake and implementation of strategies took longer and therefore increased the time before parents reported any symptom reduction. Whilst this lag could reflect an intervening event to explain improvement, this is unlikely since it occurred in both intervention groups but not in the wait-list group.

The second measure used showed a similar change across time. The Social Worries Questionnaire (Spence, 1995) demonstrated that parents in both intervention groups reported significantly fewer social worries in their children at Time 3 compared with Time 1. Whilst the SCAS-P yields information about specific types of anxiety and focuses on internal feeling states, the SWQ taps information dealing with day-to-day social worries surrounding more overt behaviours.

The child measure of ability to generate effective strategies to deal with an anxiety-provoking situation, 'James and the Maths Test', showed a significant increase in strategies from Time 1 to Time 3. It is particularly interesting to note that a child's ability to improve on 'James and the Maths Test' requires the child to generalise strategies from one situation to another and it is an important finding that the children whose parents received training demonstrated the best results on this measure.

Effect of parent involvement

There were several indicators that active parental participation in the anxiety programme produced significant benefits both for parents themselves and for the children, with parent evaluations providing overwhelming endorsement for the parent component of the programme. In the evaluations, parents reported feeling competent with the content of the programme and therefore able to assist their child, empowered by meeting parents with similar experiences, supported by the group and able to share not only problems but solutions.

The results from the measures demonstrate several significant differences found between the two intervention groups. On the total score of the SCAS-P at Time 3 there was a significant difference between the two groups, with the combined group showing a greater reduction in parent-reported symptoms. This is also the case for the separation anxiety subscale of the SCAS-P. On the Social Worries Questionnaire the difference between the two intervention groups approached significance at follow-up, with the combined group showing better results. The most compelling difference between the two groups can be seen on the child measure 'James and the Maths Test'. In the combined group it was possible for the therapist to give much more encouragement to parents in their efforts to promote use of strategies by the children. Parents had time each week to bring problems to the group and brainstorm ways to approach their child and encourage use of new skills.

Qualitative findings

Whilst conducting intervention trials it is often not possible to capture or even to hypothesise some of the findings in a quantitative medium. As part of the evaluation of the programme we asked parents to describe any changes in their child, either positive or negative, that they felt could be attributed to participation in the programme. Many parents pointed to the development of friendships among their children. Some parents noted that children seemed more confident in their day-to-day interactions and suggested that the time spent with children similar to themselves, and with very positive therapists, had helped in this respect. Other parents reported that whilst issues still arose on a regular basis for their

child, they found that the children became distressed more slowly and recovered more quickly, especially if encouraged to use strategies that they had learned. Interestingly, most of the children enjoyed attending the university each week and many were quite dismayed when the programme ended.

Clinical implications

The study showed good results with the targeted population of young people with a diagnosis of AS and was well accepted by parents and children alike. The study was designed to be of value to clinicians, and, at the behavioural treatment level, there is little to distinguish between AS and HFA. The programme is applicable to both groups. It is also the case that with very little modification the programme would be useful to more severely impaired young people and their parents.

Limitations and future research

Although the sample recruited for the current study was adequate, it was not a large sample and the findings will need to be replicated in future work. It must be acknowledged that the data collected was largely through parent-report and parents may have had expectations of improvement following their participation. It is important that future research collects data from multiple sources and accesses behavioural change as well as parent-report information. Literature on parental involvement suggests an impact of parents' own anxiety and whilst this was not addressed in this study, it should be considered in future works. The use of a parent-only group would also be valuable to compare with the findings from the extant child anxiety literature.

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Appendix: James and the Maths Test

James' teacher is Mrs. Smith. She is a nice and kind teacher. He really likes the way she manages the class. She makes the classroom quiet with no teasing between the children. She helps James with his difficulty understanding maths.

She has set a difficult maths test for the class on Tuesday and James is worried that he won't do well and the other children will think he is stupid. On the day of the big maths test, the school principal comes into the class and says that Mrs. Smith is ill today and that a new teacher will take the class, but they still have the maths test. James is very anxious because he has a new teacher that day and the children become very noisy and silly with a replacement teacher. James is also worried they could tease him especially if he doesn't do well in the maths test.

Write down what you think James could do and think to feel less anxious.