Anxiety in high-functioning children with autism

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Abstract  High-functioning children with autism were compared with two control groups on measures of anxiety and social worries. Comparison control groups consisted of children with specific language impairment (SLI) and normally developing children. Each group consisted of 15 children between the ages of 8 and 12 years and were matched for age and gender. Children with autism were found to be most anxious on both measures. High anxiety subscale scores for the autism group were separation anxiety and obsessive-compulsive disorder. These findings are discussed within the context of theories of autism and anxiety in the general population of children. Suggestions for future research are made.

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Introduction

Kanner (1943) suggested that many of the core features of autism, particularly the insistence on sameness and the repertoire of fixed behaviours, routines and obsessions, were anxiety driven. Researchers and clinicians have subsequently considered anxiety as both a possible consequence of, and a possible cause of, aspects of the behaviour of children with autism.

Kanner noted that ‘the child’s behaviour is governed by an anxiously obsessive-desire for the maintenance of sameness’ (1943, p. 245). Even minor changes in the environment may induce confusion and distress for the child with autism (Groden et al., 1994), while the fear of possible change can be a further source of anxiety. Schopler and Mesibov (1994) have further suggested that resistance to change in autism is due to...
difficulty in understanding what is happening in the environment and a feeling of constant uncertainty.

Other features of autism have been viewed by some authors as consequences of, or mechanisms for coping with, the anxiety induced by the primary difficulty in comprehending the environment. Stereotypical behaviours such as echolalia, twirling, rocking, flicking and hand flapping (Howlin, 1998) and more complex behaviours such as repetitive questioning (Thomas et al., 1998) often increase when children are distressed or anxious, suggesting that these behaviours may act as self-calming strategies for children with autism. Despert (1965) interpreted common obsessive behaviours as defences against the overwhelming anxiety experienced by children with autism. Engagement in obsessions and rituals thus appears to play a key role in keeping fear and anxiety under control (Howlin, 1997), and prevention or disruption of these behaviours may induce considerable anxiety and distress (Howlin, 1997; 1998).

Despite the role ascribed to anxiety in the difficulties of children with autism, there have been few attempts to evaluate anxiety levels in children with autism using standardized instruments. In order to provide a context for such evaluation, a number of controls appear to be appropriate. First, the prevalence and severity of anxiety in children with autism should be interpreted with reference to levels of anxiety in the general child population. Around 5 percent of children in the general population display some form of anxiety disorder, and such disorders are fairly stable in intensity and have durations ranging from 2 to 5 years (King and Ollendick, 1997). If anxiety plays a specific and important role in the difficulties of children with autism, it would be expected that the prevalence and/or severity of anxiety in children with autism would exceed levels in the general population.

In addition to the above, however, it is necessary to consider that (at least for more able children with autism) anxiety may not play a fundamental role in their difficulties, but may instead represent a secondary phenomenon, which results from these children’s self-awareness of their own difficulties when facing situations in which they are expected to display age-appropriate social judgement and social behaviour (Loveland and Tunali-Kotoski, 1997). Such anxiety might be expected to be focused on the social situations which children with autism find difficult, and might also be expected to be similar in prevalence and severity to that experienced by children who find social situations challenging for other reasons.

The present study sought to address both these issues in exploring the extent and nature of anxiety in high-functioning children with autism. We administered separate standardized measures of general anxiety, and of social worries, to groups of high-functioning children with autism,
normally developing children, and children with specific language impairment (SLI). We anticipated that as children with autism and children with SLI would find many social situations challenging, these groups would both manifest higher levels of social worries than the normally developing group. If anxiety plays a primary role in the difficulties of children with autism, however, we would expect the children with autism to show higher levels of general anxiety than either of the other groups.

Method

Sample
A group of 15 high-functioning children with autism were compared with 15 children with specific language impairment and 15 normally developing children, between the ages of 8 and 12 years. Each group consisted of 13 boys and two girls, who were matched for chronological age and gender. Mean ages were 10.27 years for the autism group, 10.25 years for the SLI group and 10.26 years for the normally developing group. Children from the autism group had received a prior diagnosis according to DSM-IV (American Psychiatric Association, 1994) criteria at a communication clinic in a local children’s hospital. The clinic consisted of a clinical psychologist, a paediatrician and a speech and language therapist, all experienced. Assessment included psychometrics (WISC, WORD), observation (in at least two settings) and parental report (semi-structured interview). Children from the SLI group had also received their diagnosis prior to the study by a speech and language therapist. In addition to assessment by a generic speech and language therapist, children were assessed by a specialist in specific language impairment. Assessments included linguistic assessments (CELF, Renfrew), observation and parental report. Children from the normally developing group were considered free of any diagnosis of psychiatric or developmental disorder. Children in all groups had intellectual and reading abilities within the average range, as assessed by their teacher or therapist. All children from the autism and normally developing groups attended mainstream school. Of the children with SLI, eight children attended mainstream school and seven attended a specialist school for children with language disorders of average intelligence.

Measures

Spence Children’s Anxiety Scale
The Spence Children’s Anxiety Scale (SCAS) (Spence, 1997a) is a 45-item self-report questionnaire used to measure overall levels of anxiety, as well
as six specific subscales of anxiety based on DSM-IV criteria. Items are rated on a four-point scale of severity, yielding a maximum possible score of 114.

The SCAS has been found to have good reliability and validity (Spence, 1994, cited by Spence, 1997a; 1997b). An internal reliability coefficient of 0.93 and a Guttman split-half reliability of 0.92 were found (Spence, 1994). Total scores were normally distributed, with a mean score of 30.56 (SD = 16.75). No validity data have been established for use with children with autism. Factor analysis (Spence, 1997b) confirmed the subtypes of anxiety measured in the scale to be consistent with the typology of the Diagnostic and Statistical Manual of Mental Disorders, fourth edition (American Psychiatric Association, 1994).

Spence Social Worries Questionnaires
The Social Worries Questionnaires (SWQ) (Spence, 1995) are used to assess symptoms of social anxiety in children. Items relate to whether the young person experiences worry about a particular social situation or tries to avoid that situation. All situations involve some form of scrutiny or evaluation by others. The questionnaires are available in versions for completion by children (the 'pupil' version) and their parents. Items are rated on a three-point scale of severity, yielding maximum possible scores of 26 and 20 respectively.

Internal reliability for the Social Worries Questionnaire has been found to be high, with a Guttman split-half reliability coefficient of 0.93 and a coefficient alpha of 0.94. Factor analysis revealed that a single factor accounted for 66 percent of the variance in test scores, confirming that the questionnaire measures a single dimension (Spence, 1995). Correlations between the pupil and parent versions of the questionnaire were significant but weak (r = 0.28).

Procedure
Children and their parent(s) were invited to the clinical psychology department of a district children's hospital. Appointments were arranged at home or school if they were not able to attend at the department, or were felt by parents to be more at ease elsewhere. Child and parent were interviewed separately. In the first interview, parents were given information regarding the experimental procedure. This involved informing them of the nature of the questions that they and their child were going to be asked. The Spence Social Worries Questionnaire (parent version) was then administered. In the second interview, the experimenter (AG) and child sat at a low table where the child was able to see and read the measures. The child was then given information regarding the experimental procedure. This involved telling them that they were going to be asked some questions about the kinds of things children might worry about. The first item administered was the Spence Children's
Anxiety Scale. Items were read to the child unless they wanted to read them themselves. The child was informed that they were going to be read some questions and that for each one they had to say whether they 'never', 'sometimes', 'often' or 'always' felt like that. During administration of the Spence Social Worries Questionnaire (pupil), items were again read out to the child unless they wanted to read them out themselves.

Other measures were also administered (Vineland Adaptive Behavior Scales, Sparrow et al., 1984; Strange Stories, Happé, 1994) but are not reported in this article.

**Results**

Data obtained did not meet criteria for parametric analysis, so Kruskal-Wallis analysis of variance was used to evaluate the overall significance of differences between groups, with Mann-Whitney U-tests used to make pairwise comparisons.

**Differences in reported anxiety**

Table 1 shows that the autism group displayed a higher mean level of anxiety than the two control groups. Kruskal-Wallis analysis of variance found a significant effect of group ($\chi^2 = 6.59$, d.f. = 2, $p < 0.05$).

Pairwise comparisons between the autism and normally developing groups showed a significant difference in mean levels of anxiety ($U = 61.0$, $p < 0.05$, one-tailed), as for the autism and SLI groups ($U = 58.5$, $p < 0.05$, one-tailed) but not the SLI and normally developing groups ($U = 100.5$, NS).

The standardization trials by Spence (1997a) found a mean score of 42.48 for clinically anxious children and 25.04 for non-clinical controls. In the present study, seven children from the autism group obtained scores equal to or higher than that clinical mean. Individual scores for the girls in the present study were well below the clinical range, but numbers are too small for any confidence in this effect.

|                      | Autism (n = 15) | SLI (n = 15) | Normally developing (n = 15) |
|----------------------|----------------|-------------|-----------------------------|
| **SCAS**             | Mean (SD)      | Mean (SD)   | Mean (SD)                   |
|                      | 36.53 (13.69)  | 23.80 (14.55)| 25.33 (10.18)               |
| **SW Q, pupil**      | 9.27 (2.89)    | 6.53 (3.94) | 6.80 (2.76)                 |
| **SW Q, parent**     | 10.67 (3.77)   | 6.07 (2.96) | 4.33 (2.16)                 |
Subscale means (Table 2) show that the autism group scored highest on separation anxiety and obsessive-compulsive disorder. For the SLI group, social phobia, separation anxiety and generalized anxiety disorder/overanxious disorder were the highest subscale scores; whereas generalized anxiety/overanxious disorder, obsessive-compulsive disorder and social phobia were the highest subscale scores for the normally developing group.

Differences in mean SWQ scores between the three groups (Table 1) show the autism group to have higher levels of social anxiety compared with their matched controls. Kruskal–Wallis analysis of variance on data taken from the pupil version of the questionnaire showed a significant group effect ($\chi^2 = 6.39$, d.f. = 2, $p < 0.05$). Pairwise comparisons between the autism and normally developing groups showed a significant difference ($U = 57.5$, $p < 0.05$, one-tailed), as did comparisons between the autism and SLI groups ($U = 63.5$, $p < 0.05$, one-tailed) but not between the SLI and normally developing groups ($U = 101.0$, NS). A highly significant group effect was also found using the parent version of the Social Worries Questionnaire ($\chi^2 = 19.66$, d.f. = 2, $p < 0.001$), with the same pattern of between-group differences.

**Discussion**

**Anxiety in high-functioning children with autism**

The aim of this study was to explore whether high-functioning children with autism would have higher levels of anxiety than two comparison

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**Table 2** Means and standard deviations for SCAS subscales for the three groups

| Subscale                        | Autism (n = 15) | SLI (n = 15) | Normally developing (n = 15) |
|---------------------------------|-----------------|--------------|-----------------------------|
| Mean (SD)                       | Mean (SD)       | Mean (SD)    |
| Panic/agoraphobia               | 5.33 (4.25)     | 3.40 (3.16)  | 2.80 (2.65)                 |
| Separation anxiety              | 7.07 (4.17)     | 4.40 (2.59)  | 3.00 (1.73)                 |
| Physical injury fears           | 4.93 (3.31)     | 2.93 (2.15)  | 2.07 (1.87)                 |
| Social phobia                   | 5.13 (3.66)     | 5.00 (4.24)  | 5.53 (3.02)                 |
| Obsessive-compulsive disorder   | 8.47 (3.68)     | 3.40 (3.04)  | 5.47 (3.46)                 |
| Generalized anxiety disorder/overanxious disorder | 5.67 (2.87)     | 4.67 (3.31)  | 6.47 (2.23)                 |
control groups. This was found to be the case. The children with autism were found to have considerably higher levels of anxiety than both the SLI and normally developing groups. Compared with Spence’s (1997a) normative data, children with autism from this study scored, on average, over 10 points higher than the mean for the non-clinical controls in her standardization trials. However, when compared with the clinically anxious population Spence used, the children with autism obtained lower scores on average, although some individual children within this group would have been considered clinically anxious.

With regard to the subscales of the SCAS, children with autism obtained higher scores than the comparison groups in four of the six subscales, in particular, obsessive-compulsive disorder and separation anxiety. These subscales were also elevated in comparison with Spence’s normative group. The highest score obtained was for the obsessive-compulsive disorder subscale. Many of the features associated with autism, such as need for sameness and a preoccupation with order and routine, have been considered as similar traits to those observed in obsessive-compulsive disorder (Szatmari et al., 1989; Tantam, 1991). Whether these characteristics of autism are, in fact, obsessive-compulsive disorder is contentious (Baron-Cohen, 1989). However, obsessive-compulsive behaviours have been found to be prevalent in previous studies and in the present study.

Research addressing anxiety in children suggests that the most prevalent anxiety disorders found are generalized anxiety disorder, overanxious disorder, separation anxiety and simple phobia (King and Ollendick, 1997). Patterns of responses for the normally developing children matched those disorders, but with the exception of separation anxiety, this was not the case for the autism group. This could be attributed to the subgroup classifications used in this measure. However, it may also suggest that while children with autism develop anxiety disorders, they are different to those of their normally developing peers.

Social anxiety in high-functioning children with autism
This study also addressed the question of whether high-functioning children with autism had higher levels of social anxiety than two comparison control groups. This was also found to be the case. Children with autism reported considerably more social worries than both the SLI and normally developing groups, as measured by the Social Worries Questionnaire. Compared with normative data provided by Spence (1995), children with autism displayed higher levels of social anxiety as rated in the pupil version of the questionnaire. Both comparison groups scored below this normative mean. Parent SWQ scores were comparable for the SLI and normally developing groups, but not so the autism group. For the children with
autism, parents gave much higher scores than the normative mean and, in fact, gave higher ratings for their children's social worries than the children themselves. This may have been due to parents having greater insight into the social worries of their child with autism.

Comparison between the social phobia subscale of the SCAS and the SWQ (pupil) shows a marked discrepancy in scores for the children with autism. This may be attributed to a difference in the aspects of social anxiety that they measure. The social phobia subscale relates to covert internal states such as worries about looking a fool in front of other people and worries about what other people think about the rater. These are perhaps items which children with autism, by definition, would not be concerned about. In comparison, the SWQ asks very overt questions relating to actions, such as going to parties and asking other children if they can play with them. Despite this difference, the importance of this finding cannot be ignored.

High-functioning children with autism have been found here to demonstrate worries about social situations, whether this be rumination or active avoidance.

This study offers some interesting insights into anxiety in high-functioning children with autism. However, it is not without limitations. Groups were small and were not matched for IQ. Although groups were considered free of pathology, this was not measured, nor were confounding factors such as family circumstance considered. Therefore, groups used in this study may not have been representative.

The present study utilized self-report instruments which, although reliable and informative, do have limitations. James et al. (1994) have argued that some measures of fear and anxiety can be particularly problematic as they are not situation-specific but measure anxiety in more general terms. Previous research has noted different fears and anxieties in children with autism compared with their normally developing peers (Howlin, 1998). This suggests that measures utilized here may not have been sensitive to individual nuances. Researchers have also noted a marked difficulty in the ability to introspect in children with autism, which in turn affects their ability to self-report (Baron-Cohen et al., 1985; Capps et al., 1992). The present study relied heavily on the ability of participants to talk about their own emotions. However, previous research has mainly focused on those most profoundly affected by the disorder and/or with additional learning difficulties, while this study focused on high-functioning children in mainstream classes.

In terms of future research, as this is the first study of its kind, replication studies would be of value. Children from a broader range of age, and ability groupings would provide some test of the generalizability of the findings. Increased rigour in selection would also reduce some of the
limitations reported here. Of interest would be older children, particularly those experiencing adolescence, as this transitional stage has been found to be problematic in this population (Gillberg, 1984; Komoto et al., 1984). Measures with more rigorous diagnostic subtypes would provide interesting illumination of the types of anxiety disorders children with autism may develop. Although significant results were found here using one-tailed statistical analysis, non-directional analysis in future studies would strengthen findings.

While the present study provided data on the levels and nature of anxiety in children with high-functioning autism, it was not possible to consider the possible precipitants of anxiety, or the behavioural or emotional responses to it. However, it is possible to hypothesize that situations such as a change in routine could be a possible precipitant of anxiety, and immersion into ritualistic behaviours a coping mechanism. Exploration into these areas would be of great clinical value.

In conclusion, this study has found significantly higher levels of anxiety and social anxiety in high-functioning children with autism compared with two comparison control groups. This is the first study to provide quantitative data on anxiety in high-functioning children with autism. Clinical case reports have suggested that children with autism are often chronically anxious, and this study has provided data to support these clinical findings.

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