

# Social vulnerability and bullying in children with Asperger syndrome



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**ABSTRACT** Children with Asperger syndrome (AS) have IQ within the normal range but specific impairments in theory of mind, social interaction and communication skills. The majority receive education in mainstream schools and research suggests they are bullied more than typically developing peers. The current study aimed to evaluate factors that predict bullying for such children and also to examine a new measure, the Social Vulnerability Scale (SVS). One hundred and thirty three parents of children with AS completed the SVS and of these 92 parents completed both the SVS and questionnaires measuring anxiety, anger, behaviour problems, social skills and bullying. Regression analyses revealed that these variables together strongly predicted bullying, but that socially, vulnerability was the strongest predictor. Test-re-test and internal consistency analyses of the SVS demonstrated sound psychometric properties and factor analyses revealed two subscales: gullibility and credulity. Limitations of the study are acknowledged and suggestions for future research discussed.

## KEYWORDS

Asperger syndrome, bullying, social vulnerability

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Asperger syndrome (AS) is an autism spectrum disorder (ASD) wherein the child has intact language and cognitive ability (Attwood, 2007; Wing, 1991). The profile of AS is of a child who is socially inept and naïve compared with a typically developing child (Gustein and Whitney, 2002). This central deficit in social interaction means that children with AS lack social intelligence, described as the capacity to 'understand interpersonal situations and transactions and to use that understanding to assist one in achieving desired interpersonal outcomes' (Greenspan and Love, 1997, p. 311). Social intelligence includes the constructs of role taking, empathic judgment, person perception, moral judgment, referential communication

and interpersonal tactics; all abilities demonstrated as deficits in a child diagnosed with AS.

Research into the 'theory of mind' skills of children with an ASD directly relates to the construct of social intelligence. Theory of mind refers to the understanding that others' beliefs can differ from one's own as well as understanding of the mental states of self and others (Baron-Cohen, 1995). Substantial empirical evidence exists to support the presence of these deficits in persons with an ASD (Golan et al., 2006). Greenspan and Love (1997) extensively reviewed the construct of social intelligence and drew the conclusion that AS, characterized by average IQ, represents a pure form of social intelligence deficit.

Constructs related to deficits in social intelligence are credulity and gullibility. Greenspan, Loughlin and Black (2001) defined credulity as 'a tendency to believe something, usually a highly questionable statement or claim, despite scanty evidence' (p. 102) and gullibility as 'a vulnerability to being tricked or manipulated' (p. 102). The authors stated that the two constructs are very closely related in that the presence of credulity invariably leads to a gullible outcome and that, while a tendency to be trusting may generally be a good and stable attribute, survival in the social world requires an ability to discriminate those occasional situations where compliance or agreement may result in an adverse outcome. The authors state that low social intelligence and specifically high credulity and gullibility may lie at the heart of poor social outcomes for children and adults with AS (Greenspan et al., 2001).

Greenspan et al. (2001) stated that people with developmental disabilities are more credulous and gullible than typically developing individuals. To provide some explanation for this, they suggested that individuals with development disabilities likely lack the perspective-taking capacity to see through exploiters or the social insight to label situations as exploitative; they may possess a motivational style that makes them overly compliant or needy in social situations, and/or they lack the social skills required to be assertive. They stated that their conclusions were based on case examples and observations and that there was no empirical research investigating social intelligence with respect to credulity and gullibility in individuals with developmental disabilities.

Nettelbeck and Wilson (2002), who have similarly described those with developmental disabilities as vulnerable to victimisation, also stated that although there is much written on the topic, there exists little systematic research to address it and enable confident conclusions to be drawn. Further, the authors stated that an important direction for future research would be to formulate a developmental analysis of vulnerability by attempting to identify behaviours in children that increase their vulnerability to

victimisation. They also stated that a standardised scale should be developed to measure vulnerability to victimisation.

## **Bullying and social vulnerability**

In the past two decades there has been growing interest in and media attention on bullying among school children, with much written about bullying in schools from researchers in many different countries (Cassidy, 2009; Rigby et al., 1997). The pervasiveness of peer victimisation among children is well documented (Mishna, 2004), with bullying in schools regarded as a significant social problem that needs to be addressed immediately (Rigby, 2004). Bullying has been defined by researchers as the repeated oppression, physical or psychological, direct or indirect, of a less powerful person by a more powerful person or group where there is always a power imbalance that makes the ill-treatment of the victim possible (Attwood, 2006; Gray, 2000; Rigby, 1997). Despite scholars' clear definitions of bullying and the many forms it takes, Sharp, Thompson and Arora (2000) state that many students' perceptions of what bullying can be is different from and narrower than the definitions used by researchers and it is difficult to achieve agreement.

Voors (2000) identified two target types for bullying in typically developing children, where the children are either one or the other: passive targets or proactive targets. Passive targets are physically weaker, anxious, evidently insecure, solitary, academic and not good at sports. Proactive targets are seen as irritating and provocative, are socially clumsy and not good at social reciprocity. These profiles together by and large illustrate the single profile of a child with AS. It is unknown, however, whether specific aspects of the disorder such as difficulties with emotion (anger and anxiety), social competence deficits, and behaviour problems play a major role in the likelihood that a child with AS will be bullied.

Despite the evidence that suggests children with AS are more likely to not understand what constitutes bullying and to be significantly more susceptible to bullying (Wainscot et al., 2008), there has been limited research into why children with AS are bullied more than typically developing children. A recent qualitative study investigating mainstream school experiences of young people with ASD suggests that social naivety leaves such students the easy targets of teasing and deception (Humphrey and Lewis, 2008) and that social interaction and communication deficits leave them vulnerable to bullying and social isolation.

The current study is the first to look at the construct of social vulnerability in children with AS. A new measure, the Social Vulnerability Scale (SVS; Stone and Sofronoff, 2006), was developed to capture the construct,

and the study aims to investigate its reliability and validity. An exploratory factor analysis will be conducted to assess the validity of potential subscales of credulity and gullibility. Secondly, the study aims to assess whether, in a population of children with AS, social vulnerability and bullying are related and if so, what the nature of this relationship is. Thirdly, the study will examine the presence of other commonly co-occurring traits (anxiety, anger, poor social skills, behaviour problems) in children with AS and whether these factors are predictors of bullying. Ethics approval for the studies reported was gained through the Behavioural and Social Sciences Ethical Research Committee of the University of Queensland in accordance with the guidelines of the National Health and Medical Research Council of Australia.

## **Method**

### **Participants**

Participants in the study were parents of school-aged children. The parents were recruited for the study by a media outreach strategy through mainstream schools in a large metropolitan area and all participation was voluntary. Parents were accepted for the study if they had a child with AS diagnosed by a paediatrician, psychologist or psychiatrist. Parents completed questionnaires for 133 children aged between 6 and 16 years ( $M = 11.89$ ,  $SD = 2.49$ ). The children were predominantly male, with 115 males and 18 females making up the sample of children. This male to female ratio of 8.6:1 is higher than the ratio of 4:1 usually reported but in line with the higher reported ratios (10:1) found in clinical samples (Attwood, 2006).

A sample of 23 parents also completed the Social Vulnerability Scale in relation to their typically developing children. This sample was screened using the parent-report measure of the Childhood Asperger Syndrome Test (CAST; Scott et al., 2002) to determine that none of the children met the cut-off of 15 or above (Williams et al., 2005) to indicate that they might meet criteria for an AS diagnosis. There were 15 male and 8 female children in this sample, with ages ranging from 6 to 14 years ( $M = 9.91$ ,  $SD = 1.73$ ).

### **Measures**

Questionnaires additional to the SVS were completed by 92 of the parents of a child with AS to measure other variables of interest, including demographics, screening of AS, anxiety, anger, social skills, bullying, and behaviour problems.

**Demographics questionnaire**

The demographics questionnaire was designed for this study and asked parents to record their child's name, gender, date of birth and age as well as parental contact details.

**Childhood Asperger Syndrome Test (CAST; Scott et al., 2002)** The CAST provides a measure of behavioural characteristics that are representative of DSM-IV-TR (American Psychiatric Association, 2000) central features of AS. It assesses parent-reported child traits such as repetitive or stereotyped behaviours and impairments in social functioning and communication. There are 37 items that require a yes or no response. Six of the items are filler items (non-scored) and 31 are scored items that give a total score. A validation study (Williams et al., 2005) found that the sensitivity of the CAST, when set at a designated cut-off score of 15, was 100% compared to a full diagnostic assessment. The present study found the CAST to have adequate internal reliability  $\alpha = .76$  (Nunnally, 1978).

**Spence Children's Anxiety Scale – Parent Form (SCAS-P; Nauta et al., 2004)** The SCAS-P is a parent-report measure of child anxiety. The 38-item scale requires parents to rate the child's level of anxiety on a four-point Likert-type scale, from zero (never) to three (always). Higher scores indicate higher levels of anxiety. For this study the total score was used in analyses. The scale had high internal consistency with this sample  $\alpha = .93$  (Nunnally, 1978).

**Eyberg Child Behaviour Inventory (ECBI; Eyberg and Pincus, 1999)** The ECBI is a measure of parent-reported child behaviour. It is a 36-item multi-dimensional measure for children aged 2 to 16 years and includes a measure of frequency of disruptive behaviours as well as number of disruptive behaviours that present a problem for parents. The ECBI intensity and problem scales demonstrated good internal reliability with the current sample,  $\alpha = .92$  and  $.91$  (Nunnally, 1978).

**Children's Inventory of Anger – Parent Form (ChIA-P; Sofronoff, 2003)** The ChIA-P was adapted for parent report by Sofronoff (2003) from the Children's Inventory of Anger (ChIA; Nelson and Finch, 2000). It is a 39-item scale measuring parent report of intensity of child anger or aggression. It is suitable for children aged 6 to 16 and parents respond on a four-point Likert-type scale from one (they wouldn't care) to four (they would explode). A total measure of anger was used in analyses with higher scores indicating more anger. The ChIA-P showed good internal consistency with this sample,  $\alpha = .94$ .

**Spence Social Skills Questionnaire – Parent(s) (SSSQ-P; Spence, 1995)**

This scale has been widely used in assessing parent-reported social skills of young people aged 8 to 18 years. It has been used previously with parents of children with AS (Sofronoff et al., 2004). The 30-item questionnaire measures parent response to items describing child social skills on a three-point Likert-type scale ranging from zero (not true) to two (mostly true). A total social skills score was used in this study, with higher scores indicating better social skills. The SSQ showed good internal reliability with the current sample,  $\alpha = .92$ .

**The Peer Relations Questionnaire for Parents (PRQ; Rigby and Slee, 1993)**

The Peer Relations Questionnaire measures parent perceptions of child social standing and involvement in bullying situations. The short version of the questionnaire has 20 items, which includes 5 filler items. It has three scales: a victim scale (5 items), a pro-social scale (4 items) and a bully scale (6 items). It asks parents to respond to each item assessing how often events occur for the child (e.g., gets picked on by others) on a four-point Likert-type scale, ranging from one (never) to four (very often). In this study, the bully scale was reduced to one question (My child bullies other children), since bullying behaviour by the child with AS was not the focus of the study. The total shortened PRQ demonstrated adequate internal reliability with this sample,  $\alpha = .76$ . The victim and the prosocial subscales showed good internal consistency,  $\alpha = .87$  and  $\alpha = .81$ , respectively.

**The Social Vulnerability Scale (SVS; Stone and Sofronoff, 2006)**

The Social Vulnerability Scale (SVS) is a 28-item measure, which requires parents/carers to respond to how often their child engages in everyday behaviours that involve social judgments and indicate social vulnerability. Parents respond on a five-point Likert-type scale, ranging from one (never) to five (always) and a total score for social vulnerability is obtained with higher scores indicating higher social vulnerability. Parents were also invited to share, in a qualitative format, a personal reflection of the types of situations that the questions asked about at the end of the scored items. The SVS was found to have good internal reliability with the current sample,  $\alpha = .93$ .

**Analyses**

In order to provide preliminary psychometric data on the SVS a factor analysis was conducted, test–re-test reliability was estimated using a sub-sample, and responses were compared with a small sample of parents of typically developing children. In order to address the questions of how the construct of social vulnerability may be related to bullying and to other

variables known to be present in children with AS (anxiety, anger, poor social competence and behaviour problems), correlations were computed and regression analyses were undertaken to determine whether these variables together or individually predict bullying. The total SVS scale was used in these analyses.

## Results

### Quantitative analyses of the SVS

Analyses were conducted to determine that the dataset was appropriate for factor analysis. The number of cases available met Coakes and Stead's (2001) criteria for the data to be factored and the results to be interpretable. Low correlations and multi-collinearity were ruled out and the Kaiser-Meyer-Olkin measure of sampling adequacy (.9) was well above the suggested cut-off of .6 (Coakes and Stead, 2001).

A factor analysis was computed using 122 completed questionnaires derived after the listwise deletion of cases with systematically missing data. Before beginning the factor analysis, the item-total statistics were examined for each item to search for item-total correlation values that were less than .4. Four of the items yielded values less than .4, (items 18, 19, 20 and 26) and these items were deleted from the scale, as they did not correlate highly with the total scale, indicating they did not tap the underlying constructs of the scale. All of the remaining items yielded item-total correlations of .48 and above, and were deemed to be of appropriate effect size.

An initial exploratory factor analysis was conducted using an oblique rotation because the measure was designed to measure one construct and we expected the subscales, if any, to be correlated. This analysis initially revealed that there were five factors with eigenvalues greater than one, which explained the majority of the variance (68.48%). However, after extraction with five factors, only two factors displayed eigenvalues over 1, accounting for 49.74% of the variance. Examination of the scree plot also revealed that eigenvalues started to level off at factor three, suggesting that a two-factor solution is most appropriate for the data.

A further factor analysis was conducted, forcing a two-factor solution on the data. Before rotation, factor one had an eigenvalue of 10.05, accounting for 41.87% of the variance and factor two had an eigenvalue of 1.66, accounting for 6.9% of the variance. After oblique rotation, factor one retained an eigenvalue of 8.18 and factor two an eigenvalue of 7.89, together accounting for 48.78% of the variance. Table 1 shows the items and their factor loadings after rotation. The two factors relate to getting tricked into things or bullied (factor one) and believing others' statements

**Table 1** Items loading on the two factors of the Social Vulnerability Scale

Item	Factor	
	1	2
1. Tricked into telling secrets	.43	
7. Tricked into taking the blame when not their fault	.49	
9. Doing unreasonable favours with little chance of return	.40	
10. Been taunted or insulted by other children to point of distress	.67	
11. Subject of practical jokes when been tricked before by person	.44	
12. Victim of provocation and only one that gets into trouble	.56	
13. Been taunted or insulted and retaliated physically	.37	
14. Lent money or things to someone who is unlikely to repay	.55	
15. Been deceived by someone who has already deceived before	.60	
16. Done something that has got them into trouble at the suggestion of others	.45	
17. Been victim of physical bullying	.62	
21. Says something because doesn't understand social rules and gets into trouble	.44	
22. Treated unkindly by a teacher because of difficulties	.82	
23. Excluded from activity by teacher because of difficulties	.83	
25. Tricked into buying another child's lunch/treats at tuckshop	.50	
2. Believe what s/he is told regardless of source reliability		-.85
3. Believe what s/he told regardless of prior deception by same person		-.80
4. Tricked into giving up objects of value		-.45
5. Believes things that other people would view as clearly untrue		-.79
6. Given in to suggestion to say something that could get into trouble for	.42	
8. Believes many things that sees/reads in advertisements/internet		-.66
24. Believes someone when they have lied to them in the past		-.61
27. Is easily fooled		-.59
28. Believes rumours even when come from unreliable source		-.54

to their own detriment (factor two). A Pearson's correlation revealed the two factors were moderately correlated with one another,  $r = .519$ , suggesting that while related they are different enough to be two distinct factors.

As the factor analysis revealed that the SVS should be reduced to 24 items, all analyses using the scale were conducted using the 24-item SVS. Means and standard deviations were derived for the sample of parents reporting on children with AS and those reporting on typical children.

An independent groups *t* test revealed a significant difference in scores on the SVS between the sample of children with AS and the sample of typically developing children,  $t(154) = 7.61$ ,  $p < .01$ . The sample of children with AS, by parent report, was significantly more socially vulnerable ( $M = 71.26$ ,  $SD = 16.05$ ) than the sample of typically developing children ( $M = 44.71$ ,  $SD = 11.18$ ).



Internal consistency was calculated using 122 completed scales with no missing data. Cronbach's alpha was .94, indicating that the 24 items in the measure are strongly correlated with each other.

Test-re-test reliability was calculated with the data from 27 participants who completed the questionnaire a second time one year later. A Pearson's correlation revealed that there was a significant positive relationship between scores on the SVS scale completed at time one and time two,  $r(25) = .85, p < .01$ .

### Qualitative analyses of the SVS

The study adopted a qualitative approach to capture important themes that related to social vulnerability and victimisation, which may not have been addressed using the items in the questionnaire. Responses by parents to the open-ended question on the SVS scale were subjected to content analysis by an independent rater (the first 20 questionnaires were checked for inter-rater reliability by another rater and 100% agreement was achieved) and main themes were extracted. Of the 92 questionnaires that prompted for parents' open-ended responses, 82 parents replied (89.13%). Thirteen themes were extracted from the parents' responses and these are shown in Table 2.

As can be seen in Table 2, parents endorsed themes that are already widely recognised as common bullying problems. For example, physical bullying 'held him down and kicked him', verbal bullying 'boys at school threatened him

**Table 2 Themes extracted from the qualitative data on the Social Vulnerability Scale**

<i>Theme</i>	<i>% of parents who endorsed the theme</i>
Verbal teasing	46.34
Physical bullying	31.70
Credulity/Deception	23.17
Verbal bullying (e.g., threatening)	15.85
Bullying clearly arising out of social deficits of child with AS	14.63
Child with AS reacts badly to what someone else has said/done	14.63
Gullibility	10.97
Exclusion	9.75
Parents that mentioned something positive	9.75
Teacher bullying the child with AS	9.02
Cyber bullying (text messages, email, Msn messenger)	2.40
Child with AS being a bully	2.40
Sexual harassment	2.40

Note. AS = Asperger syndrome.

and tried to get money from him', and exclusion 'is not included and is avoided at school' are all behaviours acknowledged as bullying within schools. However, nearly half of the parents stated that verbal teasing was a particular problem for their child, which is not so commonly recognised as bullying. Comments about verbal teasing included: 'kids at school call him psycho', and 'picked on for the way he speaks'. Other areas that were mentioned by more than 10% of parents included credulity or deception: 'believes everything other kids say, even if it's wrong' and 'has watched TV and insisted that we buy something because the salesmen said "you must buy this"'; bullying clearly arising from social deficits 'targeted at school because he can't discern if others are just joking around or mean him harm', the child with AS reacting to provocation 'peers touched him to make him explode' and gullibility 'today J threw a girl's hat on the school roof because another child told him to' and 'told to jump in the school fish pond'. Less frequent, but still present were parent perceptions of teacher bullying: 'told by teachers to "go away"' and 'I don't like doblers'. Cyber bullying and sexual harassment were not mentioned by many parents and it was rare for a parent to mention that his/her own child with AS was a bully or victimised other children.

### **Analyses of the other predictor variables (anxiety, anger, behaviour problems and social skills)**

A sample of 92 participants completed the measures for the predictor variables. The means and standard deviations for the measures are reported in Table 3.

Single sample *z* tests were performed to determine whether the mean scores of the children with AS in the current sample differed significantly from the mean scores in the normative samples. A single sample *z* test revealed that the average score on the SCAS-P for the sample of children

**Table 3** Descriptive statistics for scores on predictor measures for the current sample and standardization samples

	<i>Sample of children with AS (N = 92)</i>		<i>Reported normative data from the published standardized samples</i>		
	<i>Mean</i>	<i>SD</i>	<i>N</i>	<i>Mean</i>	<i>SD</i>
(SCAS-P) Anxiety	33.56	19.40	261	14.20	9.70
(ChIA-P) Anger	99.04	17.81	1604	94.32	21.69
(SSSQ-P) Soc Skills	29.36	10.95	187	46.11	9.03
(ECBI) – Intensity	133.77	31.22	798	96.6	35.2
(ECBI) – Problem	15.13	7.75	798	7.1	7.7

Note. AS = Asperger syndrome; SCAS-P = Spence Children's Anxiety Scale – Parent Form; ChIA-P = Children's Inventory of Anger – Parent Form; SSSQ-P = Spence Social Skills Questionnaire – Parent(s); ECBI = Eyberg Child Behaviour Inventory.

with AS significantly differed from the mean of the normative sample,  $z = 19.15$ ,  $p < .05$ . Thus, children with AS in the current sample were reported by their parents to be much more anxious than children from a non-clinical population (Nauta et al., 2004).

A single sample  $z$  test revealed that the average score on the ChIA-P for the sample of children with AS was significantly different from the average score in the typical population,  $z = 2.09$ ,  $p < .05$ , indicating that children with AS were reported to have significantly more problems with anger than children in the normative population (Nelson and Finch, 2000).

A single sample  $z$  test showed the scores on the SSSQ-P for the children with AS were significantly different from the mean of the normative population,  $z = -17.82$ ,  $p < .05$ , demonstrating that children with AS were reported by their parents to have significantly poorer social skills than children from the normative population (Spence, 1995).

Finally, a single sample  $z$  test revealed that the average scores on both the problem scale and the intensity scale of the ECBI for the children with AS were significantly higher than the mean scores in the normative population,  $z = 10.13$ ,  $p < .05$  and  $z = 10.04$ ,  $p < .05$ , respectively (Eyberg and Pincus, 1999).

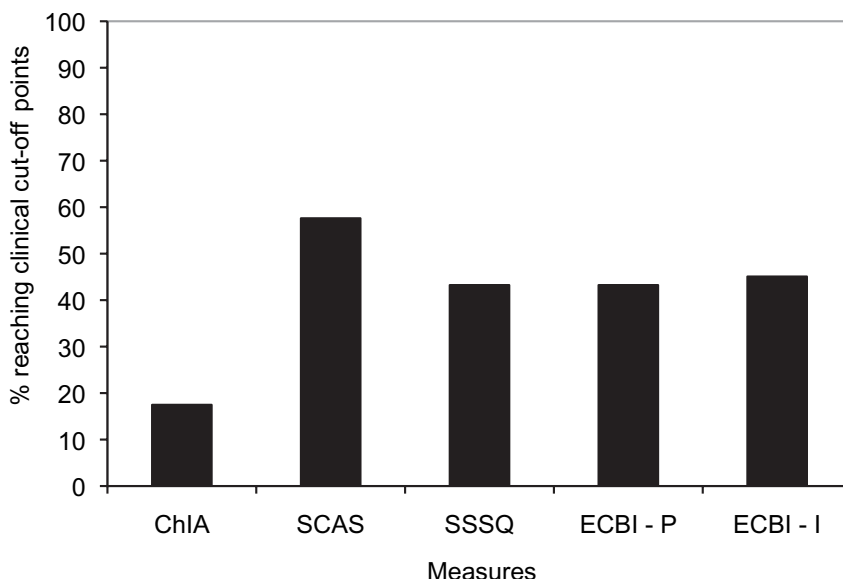
From the children whose parents completed all measures ( $N = 92$ ), it was interesting to note the number of children in the clinical range. The ChIA-P and the ECBI provide clinical cut-offs in their manuals to allow these comparisons and for the SCAS-P and the SSSQ-P, the clinical cut-offs were determined to be  $\pm 1.96$  standard deviations away from the population means. There was insufficient normative data to determine the clinical cut-offs on the SVS and PRQ. The percentage of children with AS who met the clinical cut-offs is depicted in Figure 1.

### **The relationship between social vulnerability and other variables**

Three items in the SVS overlapped in content with the PRQ, in that they addressed bullying directly. These items in the SVS were items 10 (been taunted or insulted by other children to the point of distress), 13 (been taunted or insulted by other children to the point where s/he has retaliated physically) and 17 (been the victim of physical bullying). In calculating the correlation between the PRQ and the SVS, these items were deleted from the SVS, so that inclusion would not inflate the correlation coefficient between the two variables.

Correlations were significant with the SVS and all measured variables. A Pearson's correlation revealed that there was a significant positive relationship between scores on the SVS and scores on the victim scale of the PRQ,  $r(90) = .54$ ,  $p < .01$ , indicating that higher scores on social vulnerability were associated with higher levels of bullying. Analyses showed a

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**Figure 1 Percentage of children with Asperger syndrome meeting clinical cut-off**

ChIA = Children's Inventory of Anger; SCAS = Spence Children's Anxiety Scale; SSSQ = Spence Social Skills Questionnaire; ECBI-P = Eyberg Child Behaviour Inventory–Problem; ECBI-I = Eyberg Child Behaviour Inventory–Intensity.

significant negative relationship between scores on the SVS and the Spence Social Skills Questionnaire (SSSQ),  $r(90) = -.35$ ,  $p < .01$ , suggesting that higher scores on social vulnerability were associated with lower scores on the social skills measure.

### **The relationship of victim status (bullying) with predictors – regression analyses**

Preliminary simple regression analyses were conducted to examine the relationship between the dependent variable of bullying (as measured by the victim scale of the PRQ) and the independent predictor variables: social vulnerability (SVS), anger (ChIA-P), anxiety (SCAS-P), social skills (SSSQ-P), and behavioural problems (ECBI – intensity and problem scales). As with the correlation analyses, items 10, 13 and 17 were deleted from the SVS before commencing the regressions analyses. Analyses revealed that together, social vulnerability, anger, anxiety, social skills and behavioural problems significantly predicted bullying as a model,  $R^2 = .34$ ,  $F(6, 85) = 7.20$ ,  $p < .001$ . However, analysis of the standardised regression coefficients, to determine the relative strengths of the variables, revealed that only social vulnerability significantly predicted bullying on its own,  $\beta = .51$ ,  $p = .000$ . Anger, anxiety, social skills, and intensity and number of behaviour problems

all failed to independently predict bullying. Together, these results indicate that social vulnerability accounts for the strength in the regression model and significantly overrides the other variables in the prediction of bullying. This may be expected as all the other variables correlated significantly with social vulnerability but not with bullying.

## Discussion

### The Social Vulnerability Scale (SVS)

This study is the first to examine the psychometric properties of the SVS. The resulting 24-item SVS was shown to possess good internal reliability, providing evidence that the scale is a cohesive and reliable measure of a real and existing construct of social vulnerability. Further, the test–re-test analysis revealed that parents’ answers to the items were very closely related to their responses to the items approximately one year later. This demonstrated that the scale was robust across time and further adds to its credibility for real-world use.

The exploratory factor analysis showed the scale was comprised of two distinct factors, moderately correlated to one another. The first factor encompassed items about being easily tricked or manipulated by others and the second factor was comprised of items about believing others’ statements or suggestions. This finding of two distinct factors is consistent with previous research conducted by Greenspan et al. (2001). Thus, using these definitions as a guide, the two factors that make up the SVS may be labeled as credulity and gullibility.

The significant difference between mean scores on the SVS for the sample with AS and the typically developing sample demonstrates that social vulnerability appears as a trait in children with AS that is able to distinguish them from typically developing children. It may be that a high level of social vulnerability is related to a poorly developed theory of mind, as this is a consistent marker between children on the autism spectrum and typically developing children. This would make sense if one considers that theory of mind skills enable an individual to entertain the real possibility that another’s thoughts or intentions may be different from their own. Thus, with deficits in theory of mind, an individual may be credulous and gullible because they do not have the ability to see that someone might be trying to mislead or trick them, this requiring understanding of a different state of mind from their own.

The finding that children with AS demonstrate social vulnerability is consistent with previous research that suggests a lack of social intelligence (i.e., the ability to understand interpersonal situations and to use that

understanding to achieve desired interpersonal outcomes; Greenspan and Love, 1997). Low social intelligence is a unique problem that has been shown to lead to lower acceptance and more exclusion by peers and increased internalized maladjustment (Rotenberg et al., 2005). It seems likely that the reasons given by the parents in this study for their child's being bullied reflect a combination of their child's own deficits in social intelligence and social vulnerability, and the willingness of other children to take advantage of this.

The qualitative analyses highlighted specific areas of concern related to bullying arising from social deficits, gullibility and overreaction to provocation. This supports Attwood's (2006) claim that children with AS are easy targets for subtle bullying such as teasing, which may have unique effects on a child with AS. Verbal teasing was reported as a particular problem for the current sample supporting Rigby's (1997) research that showed verbal teasing as one of the most common forms of bullying in Australia. It can however be more damaging for a child with AS, who has difficulty understanding teasing and can neither reciprocate good natured teasing nor distinguish it from malice (Heerey et al., 2005).

Issues related to credulity/deception, bullying arising from the child's social deficits, the child overreacting to provocation, exclusion, and teacher bullying were also mentioned by more than 10% of parents. With the exception of exclusion and teacher bullying, these problems seem to be related directly to the core symptoms of AS. For example, credulity and gullibility are consistent with the often trusting nature and the tendency to take things literally of a child with AS. Bullying arising from social deficits is related to the general lack of social understanding and skills and overreacting to provocation reflects deficits in impulse control and emotional regulation. The qualitative analyses suggested that parents viewed social vulnerability as a serious issue for their children, and it was often cited as responsible for or contributory to their victimisation.

### **Relationships among social vulnerability, anxiety, anger, behaviour and social skills**

Social vulnerability (SVS) was correlated negatively with social skills, such that lower social skills predicted greater social vulnerability. Anxiety, anger and behavioural problems were also significantly correlated with social vulnerability, with higher levels indicating greater social vulnerability. Parents of children with AS reported greater anger, anxiety and behavioural problems than parents of typically developing children; this is consistent with research that has demonstrated children with AS often experience anxiety (Gadow et al., 2005; Russell and Sofronoff, 2005), anger (Sofronoff et al., 2007) and/or behaviour problems (Myles and Simpson, 2002).

These results are consistent with Attwood's (2004) suggestion that when one considers the difficulties of children with AS with regard to social reasoning, empathy, non-verbal communication and sensory perception, they are clearly prone to considerable stress that is undoubtedly exacerbated by bullying.

### **Bullying in children with Asperger syndrome**

Social vulnerability was found to be strongly and positively correlated with bullying in children with AS. The regression analysis gave partial support for the suggestion that the presence of high levels of social vulnerability, anxiety, anger, and behaviour problems and low levels of social skills would predict peer victimisation in children with AS. Although the presence of all the factors together predicted peer victimisation, only social vulnerability was an independently significant predictor of peer victimisation or bullying.

It is somewhat perplexing that high levels of anxiety, anger and behaviour problems and low levels of social skills have been shown to predict bullying in previous studies, but did not separately predict it in the current sample of children with AS. This is especially so, since the children with AS in the current sample were reported to display significantly higher levels of anxiety, anger and behavioural problems and significantly lower levels of social skills than typically developing children. A possible reason for this may be that past research has been conducted solely with typically developing children. Perhaps children with AS are so gullible and credulous that typical children see this as a particular weakness and take advantage of them, bullying them in more indirect or subtle ways. It may be that their anxiety, anger and behaviour problems are not as obvious to other children as their 'social vulnerability', or propensity to be trusting and easily misled. The finding that social vulnerability uniquely predicts bullying in children with AS is consistent with previous research suggesting that children who were trusting and more naïve were bullied more because they stood out from the group (Rotenberg et al., 2005).

It must be noted that the results of the correlation and regression analyses also show that there are some children with AS who do not display high levels of social vulnerability and are victimised less. This is important as it highlights that not every child with AS is highly socially vulnerable and not every child with AS is bullied or victimised. Future research in this area may help to identify traits and skills to try and build up and/or train in vulnerable children.

### **Clinical implications**

The major purpose for conducting this research was to try and determine the factors that predicted bullying in children with AS, so that appropriate

interventions could be developed to minimise the problem. Following from the results of the current study, one of the key foci for intervention in bullying for children with AS may be minimising social vulnerability (gullibility and credulity) and increasing social understanding. Even though anxiety, anger, behaviour problems and social skills were not found to be unique predictors of bullying, an intervention would ideally include strategies to manage these factors. Furthermore, so the onus is not on the child with AS (Attwood, 2006), a wide education program could be disseminated through schools, so others are aware that subtle bullying (teasing, deceiving or tricking deliberately) is just as damaging as physical and verbal bullying. This educational team approach has been strongly advocated (Attwood, 2006).

### **Limitations and future research**

The study had the limitation of a relatively small sample size that frequently occurs with a population such as AS. For this reason the results should be treated with caution and further data should be collected including data from a larger cohort of parents of typically developing children. The data collected came solely from parents and it is possible that the parents who did respond were biased to be overly representative of children who were socially vulnerable and bullied. It is also possible, however, that parents are unaware of the full extent to which their child is bullied and so may under-report. The study used cross-sectional methodology to examine the variables of anxiety, anger, social skills, behavioural problems, social vulnerability and bullying. A limitation of this is that causality cannot be inferred, thus it is difficult to know whether social vulnerability leads to higher levels of anxiety, anger, behavioural problems and lower levels of social skills, or whether the presence of these factors leads to social vulnerability. It also may be the case that the variables are causally unrelated but all occur quite frequently in children with AS. Longitudinal methodology would help to clarify this issue.

### **Conclusions**

The results from the study demonstrate that parents see bullying as a significant problem for many children with AS. The findings also suggest that there is a relationship between social vulnerability as measured by the SVS and victim status in children with AS. Whilst the current findings are preliminary, they are nonetheless indicative that future research in this area is warranted.



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