

BJPO/2015/000976

Data supplement

Table DS1 Sensitivity and specificity of parent-report of ASD compared with clinical ASD diagnosis taken from medical records

	Parent report	
Medical records¹	No diagnosis	ASD diagnosis
No diagnosis or not searched		
n	7613	58
%	99.24	0.76
ASD diagnosis*		
n	2	37
%	5.13	94.87

¹Details of search strategy of medical records given in (Williams et al¹⁸). *ASD diagnosis restricted to those with statements.

Table DS2 Requirements laid out in ICD-10 diagnostic criteria for autism and behavioural traits utilised showing how they match the criteria

ICD-10 diagnostic criteria for research : diagnostic thresholds for autism ²	Behaviour associated with autism measured in both cohorts (age measured)	How behavioural measure fulfils criteria
Abnormal or impaired development in the following domains:		
<p>1. Social-communication, two of the following areas:</p> <p>(1) A delay in, or total lack of development of spoken language not accompanied by compensation through the use of gesture</p> <p>(2) Failure to initiate or sustain conversational interchange (at whatever level of language skills are present)</p> <p>(3) Stereotyped and repetitive use of language or idiosyncratic use of words or phrases</p> <p>(4) Abnormalities in pitch, stress, rate, rhythm and intonation of speech</p>	<p>Language for communication: foundation assessment (4/5 years) Scale of 0-9: a score of 1 was given by teacher for each milestone attained.</p> <ul style="list-style-type: none"> • <i>Talks and listens confidently and with control, showing awareness of the listener by including relevant detail. Uses language to work out and clarify ideas, showing control of a range of appropriate vocabulary</i> • <i>Speaks clearly with confidence and control, showing awareness of the listener</i> • <i>Uses talk to organise, sequence and clarify thinking, ideas, feelings and events, exploring the meanings and sounds of new words</i> • <i>Interacts with others in a variety of contexts, negotiating plans and activities and taking turns in conversation</i> • <i>Uses language to recreate roles and experiences</i> • <i>Listens with enjoyment to songs rhymes and poems, sustains attentive listening and responds with relevant comments questions or actions</i> • <i>Talks activities through, reflecting on and modifying actions</i> • <i>Initiates communication with others</i> • <i>Listens and responds</i> • <i>None of the above</i> 	<p>Although very generic, this trait reflects criteria (1 & 2)</p>

<p>Three of the following areas:</p> <p>(1) Receptive or expressive language as used in social communication</p> <p>(2) Development of selective social attachments or of reciprocal social interaction</p> <p>(3) Functional or symbolic play</p>	<p>Social development: foundation assessment (4/5 years old) Scale of 0-9: a score of 1 was given by teacher for each milestone attained (numbered below).</p> <ul style="list-style-type: none"> • <i>Takes into account the ideas of others</i> • <i>Understands that s/he can expect others to treat his/her needs views, cultures and beliefs with respect</i> • <i>Understands that people have different needs, views and cultures and beliefs that need to be treated with respect</i> • <i>Understands the need for agreed values and codes of behaviour for groups of people, including adults and children to work together harmoniously</i> • <i>Forms good relationships with adults and peers</i> • <i>Works as part of a group or class taking turns and sharing fairly</i> • <i>Takes turns with adult support</i> • <i>Builds relationships through gesture and talk</i> • <i>Plays alongside [not with] others</i> • <i>None of the above</i> <p>From Department of Education and Skills.²¹</p>	<p>Negative answers to all of these questions capture lack of socio-emotional reciprocity as shown by an impaired or deviant response to other people's emotions described in criteria (2) of ICD-10 (column 1)</p>
<p>2: Social interaction, one of the following areas:</p> <p>(1) Failure adequately to use eye-to-eye gaze, facial expression, body posture and gesture to regulate social interaction</p> <p>(2) Failure to develop peer relationships involving a mutual sharing of interests, activities and emotions</p>	<p>SDQ peer problems (7/8 years) Composed of the following five items in the SDQ questionnaire ², which were rated by both parents and teachers as <i>Doesn't apply/Somewhat applies/Certainly applies</i>:</p> <p><i>The child:</i></p> <ul style="list-style-type: none"> • <i>gets on better with adults than children</i> • <i>rather solitary, often plays alone</i> • <i>has at least one good friend</i> • <i>is generally liked by other children</i> • <i>picked on or bullied by other children.</i> 	<p>Item questions capture failure to develop peer relationships as described in criteria (2) of ICD-10 (column 1)</p>

<p>(3) A lack of socio-emotional reciprocity as shown by an impaired or deviant response to other people's emotions; or lack of modulation of behaviour according to social context; or a weak integration of social, emotional and communicative behaviours</p>	<p>SDQ prosocial score (7/8 years) Composed of the following five items in the SDQ questionnaire ², which were rated by both parents and teachers as <i>Doesn't apply/Somewhat applies/Certainly applies</i>:</p> <p><i>The child:</i></p> <ul style="list-style-type: none"> • <i>is considerate of other people's feelings</i> • <i>shares readily with other children (treats, toys, pencils, etc.)</i> • <i>is helpful if someone is hurt, upset or feeling ill</i> • <i>is kind to younger children</i> • <i>often volunteers to help others (parents, teachers, other children).</i> 	<p>Negative answers to all of these questions capture failure to develop socio-emotional reciprocity as described in criteria (3) of ICD-10 (column 1)</p>
<p>3. Restricted, repetitive, and stereotyped patterns of behaviour, two of the following areas:</p> <p>(1) An encompassing preoccupation with one or more stereotyped and restricted patterns of interest; or one or more interests that are abnormal in their intensity although not abnormal in their content or focus</p> <p>(2) Compulsive adherence to specific, non-functional, routines or rituals</p> <p>(3) Stereotyped and repetitive motor mannerisms that involve either hand or finger flapping or twisting, or complex whole body movements</p> <p>(4) Preoccupations with part-objects or non-functional elements of play materials</p> <p>(5) Distress over changes in small, non-functional, details of the environment</p>	<p>Afraid of new things or new situation (7/8 years) This was a response by parent and teacher to the single question 'Does the child tend to be afraid of new things or new situations?' rated by both parents and teachers as <i>Doesn't apply/Somewhat applies/Certainly applies</i>.</p>	<p>This trait was considered as distress over changes in environment as described in diagnostic criteria.</p>

Table DS3 Cross-tabulation of parent report ASD diagnosis (yes/no) and top 5% of CATS score (yes/no)

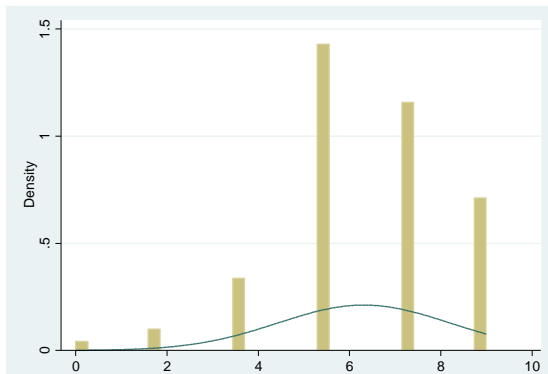
Parent-report ASD diagnosis	Top 5% CATS	
	No	Yes
No n	14,726	804
%	95	5
Yes n	70	140
%	33	67

Table DS4 Association of behavioural traits with parent-report ASD measured in both cohorts

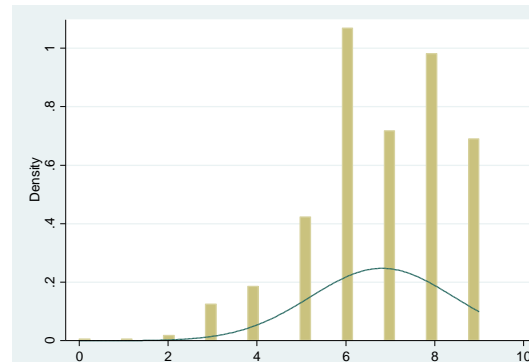
Trait	Domain	Age of child	Source	Crude association with diagnosis of ASD in each cohort			
				ALSPAC OR (95% CI)	<i>p</i>	MCS OR (95% CI)	<i>p</i>
SDQ prosocial behaviour	Social behaviour	7	Parent report	0.59 (0.52, 0.68)	<0.001	0.54 (0.50,0.59)	<0.001
SDQ peer problems	Social behaviour	7	Parent report	1.77 (1.57, 2.00)	<0.001	1.90 (1.77, 2.04)	<0.001
SDQ nervous in new situations	Restricted interests	7	Parent report	2.55 (1.77, 3.68)	<0.001	2.71 (2.14, 3.43)	<0.001
SDQ prosocial behaviour	Social behaviour	7 or 8	Teacher report	0.75 (0.64, 0.86)	<0.001	0.64 (0.59,0.70)	<0.001
SDQ peer problems	Social behaviour	7 or 8	Teacher report	1.53 (1.37, 1.70)	<0.001	1.64 (1.52, 1.75)	<0.001
SDQ nervous in new situations	Restricted interests	7 or 8	Teacher report	4.33 (2.76, 6.81)	<0.001	2.57 (1.95, 3.37)	<0.001
Language and communication	Social communication	4 or 5	Foundation stage school assessment	0.57 (0.47, 0.71)	<0.001	0.62 (0.56, 0.69)	<0.001
Social communication development	Social communication	4 or 5	Foundation stage school assessment	0.59 (0.50, 0.70)	<0.001	0.52 (0.47, 0.59)	<0.001

Fig DS1 Distribution of foundation assessment score in ALSPAC and MCS.

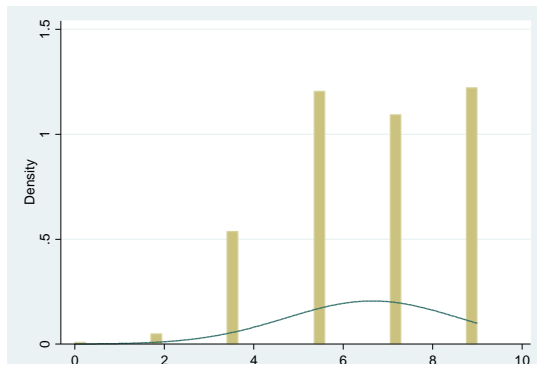
ALSPAC: social development



MCS: social development



ALSPAC: language for communication



MCS: language for communication

