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REPORT: USE OF THE STRENGTHS AND DIFFICULTIES QUESTIONNAIRE FOR MONITORING THE WELLBEING OF CHILDREN AND YOUNG PEOPLE WITH LEARNING DISABILITIES

Stream 2 of the wider project: Gathering feedback and measuring outcomes and change with Children and Young People with Learning Disabilities (LD)

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Find more information here:

<https://www.corc.uk.net/outcome-experience-measures/feedback-and-outcome-measures-for-children-and-young-people-with-learning-disabilities/>

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Report: Use of the Strengths and Difficulties Questionnaire for monitoring the wellbeing of children and young people with learning disabilities

Gathering feedback and measuring outcomes and change with Children and Young People with Learning Disabilities (LD)

This analysis is part of the “Special Measures” Project funded by the British Psychological Society’s Division of Clinical Psychology (BPS DCP) and delivered in collaboration with the Child Outcome Research Consortium (CORC). The project seeks to increase equality and diversity in feedback and outcome measures by progressing practice and practice-guidance on measures and methods for children and young people with learning disabilities (CYP-LD), their families and networks.

SUMMARY

It has been suggested that the pattern of emotional and behavioural difficulties may be different among children and young people with learning disabilities when compared to their peers. Therefore, it has been argued that scales developed for the general population may not be applicable to children and young people with learning disabilities, especially those with more severe learning disabilities. The aim of this report was to present new data, extracted from the UK’s Millennium Cohort Study, on the face validity, factorial structure and reliability of the SDQ when used with children with learning disabilities.

Face Validity

There is relatively robust evidence that: (1) a wide range of emotional and behavioural difficulties are more common among children with learning disabilities when compared with their peers; and (2) that these difficulties are associated with increased family burden. The analyses of SDQ data presented in this report (including subscale scores and result of the impact supplement) are fully consistent with this existing literature. The analyses also indicated that, in general, greater severity of learning disabilities tended to be associated with more severe emotional and behavioural difficulties.

Factorial Structure and Reliability

- The analyses undertaken do suggest that the factorial structure of the SDQ may be less stable for children with learning disabilities. However, this may also simply reflect the much smaller sample sizes available for children with learning disabilities.
- There were no systematic differences in the internal consistency of the SDQ scales between children with and without learning disabilities.
- Consistent with the results of previous research, the association between maternal report and teacher report of emotional and behavioural difficulties were weak to modest. There were no systematic differences in the strength of these associations between children with and without learning disabilities.
- Consistent with the results of previous research, the association between maternal report and child self-report of emotional and behavioural difficulties was weak. Overall, the association was stronger for children without learning disabilities. However, this difference was only apparent for girls.
- Among children with learning disabilities there was very little evidence that key psychometric characteristics of the SDQ vary by severity of learning disability in the sample.

Conclusion

We found little evidence to support the contention that the parent completed SDQ may not be applicable to children and young people with learning disabilities, including those with more severe disabilities in the sample.

BACKGROUND

It has been suggested that the pattern of emotional and behavioural difficulties may be different among children and young people with learning disabilities when compared to their peers. Therefore, it has been argued that: (1) scales developed for the general population may not be applicable to children and young people with learning disabilities; and (2) scales may need to be developed specifically for children and young people with learning disabilities.

It is currently recommended by CORC (Child Outcomes Research Consortium) on the basis of a consensus development exercise that the SDQ could be appropriately used with children and young people with mild learning disabilities, 'but not those with more severe disabilities'. No research evidence was cited in support of the recommendation that the SDQ would be inappropriate to use with children and young people with more severe learning disabilities. However, a comment from the primary developer of the SDQ (Robert Goodman) was included in the recommendation; 'his experience that the SDQ generally works well for mild intellectual disability but not severe/profound intellectual disability "... at least in part because the high rate of self-injurious behaviour and autistic features is not well covered".¹

Previous Research on the Applicability of the SDQ to Children and Young People with Learning Disabilities

Very little research has been conducted on the applicability of the SDQ to children and young people with learning disabilities.² The research that has been undertaken is summarised below.

1. A relatively small scale Australian study reported that the parental completed SDQ total difficulties score correlates well with the parent version of the Developmental Behaviour Checklist (DBC-P) total behaviour problem score and that agreement between the SDQ borderline cut-off and the DBC-P cut-off for abnormality was high (83%). Positive agreement between the DBC-P and the SDQ borderline cut-off was also reported to be high, with the SDQ borderline cut-off identifying 86% of those who met the DBC-P criterion.³ Unfortunately no information was available on the severity of learning disability of participants.
2. More recently a much larger UK study has reported a strong association between the SDQ Total Difficulties score and the DBC-P and supported the use of the same SDQ cut-off for those with and without intellectual disability.⁴
3. The SDQ subscales of conduct difficulties, hyperactivity/inattention and peer problems (but not total difficulties) were sensitive to change over time following intervention by a Family Intensive Support Service for Children presenting with learning disabilities and challenging behaviours.⁵ While no

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information is provided on the severity of learning disability of the participants, it is implied in the discussion that the children had ‘significant learning disabilities’.

4. Inter-rater reliability between parent, teacher and child completed SDQ data are similar for children with and without learning disabilities, as are measures of the internal consistency of SDQ subscales.⁶
⁸ Two of these studies focused on children with mild-moderate learning disability.^{6,8} The other was undertaken on a sample of 33 children with a mean age of 9.0 years and a mean developmental delay of 3.8 years.⁷
5. The pattern of child self-reported SDQ scores is also consistent with ICD-10 psychiatric diagnoses in children with mild-moderate learning disabilities.⁶
6. There was no evidence of response bias among children with mild-moderate learning disabilities.⁶

Research Aims

Given the paucity of research on the applicability of the SDQ to children and young people with learning disabilities we sought to determine:

1. Whether there are differences between data collected on children with and without learning disabilities regarding the
 - a. The prevalence and severity of emotional and behavioural difficulties
 - b. factorial structure of the SDQ
 - c. internal consistency of SDQ sub-scales
 - d. level of agreement between maternal completed and completed teacher completed versions of the SDQ
 - e. level of agreement between maternal completed SDQ data and child-self report data.
2. Whether there are differences among children with different severity of learning disabilities regarding these four characteristics of the SDQ.

Learning disabilities is the term used in this project and report, used in the plural form to denote a range of abilities/disabilities in a range of people. Current Department of Health (DH) definition in their policy and practice documents includes:

- significantly reduced ability to understand new or complex information, to learn new skills
- reduced ability to cope independently which starts before adulthood with lasting effects on development.⁹

The “significantly reduced ability to understand new or complex information, to learn new skills” is taken to be 2 Standard Deviations below the mean on a validated test of general cognitive functioning (equivalent to an IQ score of less than 70).

As such, our use of the term ‘learning disabilities’ is broadly synonymous with the international terms ‘intellectual disabilities’ and (in ICD-11) ‘disorders of intellectual development’.

METHODS USED

We undertook secondary analysis of Waves 2-6 of the UK's Millennium Cohort Study (MCS). MCS is the fourth in the series of British birth cohort studies. It aims to follow throughout their lives a cohort of over 18,000 children born in the UK between 2000 and 2002. MCS data are managed by the Centre for Longitudinal Studies at the University of London (www.cls.ioe.ac.uk/) and are available to researchers registered with the UK Data Service (<http://ukdataservice.ac.uk/>). Full details of the design of MCS are available in a series of reports and technical papers,¹⁰⁻¹² key aspects of which are summarised below.

Sampling

Participant families were randomly selected from Child Benefit Records, a non-means tested welfare benefit available to all UK children. Sampling was geographically clustered to include all four countries of the UK (England, Wales, Scotland, Northern Ireland), and disproportionately stratified to over-sample children from ethnic minority groups, disadvantaged communities and children born in Wales, Scotland and Northern Ireland.¹³ Children and families were drawn from 398 randomly selected electoral wards in the UK. The first survey (MCS1) took place when children were nine months old and included a total of 18,551 families. Children were followed up at ages three (MCS2; 15,590 families, 84% retention rate from MCS1), five (MCS3; 15,246 families, 82% retention rate from MCS1), seven (MCS4; 13,857 families, 75% retention rate from MCS1), 11 (MCS5; 12,813 families, 69% retention rate from MCS1) and 14 (MCS6; 11,726 families, 63% retention rate from MCS1). For each family, information was collected on the target child falling within the designated birth date window. For multiple births (e.g., twins, triplets) information was collected on all children.

Procedure

All data used in the present study were collected by parental report, direct cognitive testing of the child and data linkage.

Identification of Children with Learning Disabilities

To identify whether children had a learning disability we followed a procedure that has been used extensively with MCS data and other surveys to estimate IQ for abbreviated cognitive test scores.¹⁴⁻³¹ Child cognitive ability was assessed at age three using the Bracken School Readiness Assessment³² and Naming Subscale of the British Ability Scales BAS;³³ selected subscales of the BAS at ages five and seven, and the National Foundation for Educational Research (NFER) Progress in Maths test at age seven.³⁴ At age eleven children were given three cognitive tests; verbal similarities (BAS), the Spatial Working Memory task and the Cambridge Gambling task, both from the Cambridge Neuropsychological Test Automated Battery. Of the age eleven tests, only the verbal similarities test was closely related to traditional measures of IQ.

For ages five and seven we extracted the first component ('g') from a principal component analysis of all age-standardised subscale/test scores.¹⁴⁻¹⁷ The first component accounted for 63% of score variance at age seven and 55% of score variance at age five. We identified children as having learning disability if they scored two or more standard deviations below the mean on the first principal component at age seven (n=423 [3.3%] of 12,799 children for whom test results were available).

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If cognitive test scores were missing at age seven, we identified children as having learning disability if they scored two or more standard deviations below the mean on the first principal component at age five (n=146 [6.5%] of 2,250 children). If cognitive test scores were missing at age five and at age seven, we identified children as having learning disability if they scored two or more standard deviations below the mean on the Bracken School Readiness Assessment at age three (n=56 [4.4%] of 1110 children). If Bracken scores were not available, we identified children as having learning disability if they scored two or more standard deviations below the mean on the BAS Naming Subscale at age three (n=19 [17.2%] of 110 children). Overall this procedure identified 644 children as having learning disabilities from the 16,269 children for who cognitive tests were available.

For 2,975 children no cognitive test results were available at any age. Of these, 2736 (92.0%) did not participate at all in Waves 2-4. For the 239 who did participate in at least one of these waves, interviewers did not administer cognitive assessments if the child 'has a learning disability/serious behavioural problem (e.g., severe ADHD, autism) which prevents them from carrying out the assessments', 'is unable to respond in the required manner for each assessment, e.g., reading, writing, manipulating objects', 'is not able to speak or understand English (or Welsh if applicable)' or if consent and co-operation were not forthcoming. For these children we identified learning disability on the basis of parental report at age seven. A child was identified as having learning disability if both of the following two criteria were met: (1) the child was reported to be receiving special education due to their 'learning difficulty' (the term used in educational services in the UK to refer to learning disability); AND (2) the child was reported to have 'great difficulty' in all three areas of reading, writing and maths. This led to the identification of another 10 of 79 children as having learning disability.

Finally, we used the normalised verbal similarities standard score at age eleven to attempt to address potential errors in classification derived from the W2-4 variables. Specifically, all children who had been identified as having learning disability who scored at or above the population mean on verbal similarities at age eleven were reclassified as not having learning disability. Similarly, all children identified as not having learning disability but who scored three or more standard deviations below the population mean on verbal similarities at age eleven were reclassified as having learning disability.

This procedure led to the identification of 665 of the 16,342 (4.1%) children for who data was available as having a learning disability. As expected, boys were significantly more likely than girls to be identified as having learning disability (4.3% vs 2.6%; OR=1.67, 95% CI 1.42-1.96).

We had estimates of IQ ('g') from a principal component analysis of age-standardised subscale/test scores for 649 (97.6%) of children we had identified as having learning disabilities. We used these estimates of IQ in two ways to create subgroups of children with learning disabilities. First, we created three groups ranging from least to most severe based on approximately equal numbers per group (population tercile groups; least severe (estimated IQ > 67.3, n=217), moderately severe (estimated IQ 62-67.3, n=218), most severe (estimated IQ < 62, n=214). These categories do not correspond to traditional categories of severity of learning disability. Instead they represent a pragmatic approach to deriving a classification of different levels of severity which has the greatest statistical power to examine variation in outcomes at differing levels of severity of learning disability. Second, we created two groups based on more traditional IQ cut-offs; those scoring 2 to 3 standard deviations below the population mean (estimated IQ 55-69, n= 576) and those scoring more than 3 standard deviations below the population mean (estimated IQ <55, n= 73).

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The classification system we used is based solely on evidence of impaired cognitive functioning, an approach which is consistent with the ICD-10 definition of ‘mental retardation’.³⁵ However, the ICD-11 definition of ‘disorders of intellectual development’ also contains criteria based on adaptive behaviour or functioning.³⁶ As such the classification system used in this report may be overinclusive when compared against ICD-11 criteria.

The Strengths & Difficulties Questionnaire (SDQ)

The MCS has used the SDQ³⁷⁻⁴¹ in Waves 2-6. It is psychometrically robust instrument commonly used in large-scale population surveys to measure emotional and behavioural difficulties in children.^{39, 40, 42, 43} The SDQ is comprised of four problem-oriented subscales (Conduct Difficulties, Emotional Difficulties, Hyperactivity, Peer Problems) and a Pro-social Behaviour subscale. Each subscale consists of five items relating to child behaviour (e.g., ‘[child’s name] is often unhappy, down-hearted or tearful’), rated by the parental informant on a three-point Likert scale (not true, somewhat true, certainly true) in relation to the child’s behaviour over the previous six months. Scores on the four problem-oriented sub-scales are summed to produce a Total Difficulties score.

There are three versions of the SDQ designed for: (1) parental completion; (2) child-self completion (age 11+); (3) teacher completion. The MCS included the parental completion form in Waves 2-6 and the teacher completion form in Waves 4 (age 7) and 5 (age 11). MCS has not included the child self-completion form of the SDQ in any Wave. The availability of complete SDQ data collected from the child’s biological mother at each wave for children with and without learning disabilities is presented in Table 1.

Age	Children with learning disabilities	Children without learning disabilities
3	192 (41%)	8,239 (65%)
5	312 (61%)	10,977 (78%)
7	291 (63%)	10,018 (81%)
11	379 (73%)	12,183 (85%)
14	280 (75%)	8,422 (85%)

In addition, the extended SDQ includes an ‘impact supplement’ that is answered after the above section.

Q1: Overall, do you think that your child has difficulties in one or more of the following areas: emotions, concentration, behaviour or being able to get on with other people? (Response options: No; Yes- minor difficulties; Yes- definite difficulties; Yes- severe difficulties). If the respondent answers ‘Yes’ to Q1 the following questions are asked.

Q2: How long have these difficulties been present? (Response options: Less than a month; 1-5 months; 6-12 months; Over a year)

Q3: Do the difficulties upset or distress your child? (Response options: Not at all; Only a little; Quite a lot; A great deal)

Q4: Do the difficulties interfere with your child’s everyday life in the following areas? (a) home life, (b) friendships, (c) classroom learning, (d) leisure activities (Response options: Not at all; Only a little; Quite a lot; A great deal).

Q5: Do the difficulties put a burden on you or the family as a whole? (Response options: Not at all; Only a little; Quite a lot; A great deal).

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The MCS has included the parent completed impact supplement of the SDQ in Wave 2 (age 3), Wave 3 (age 5) and Wave 4 (age 7).

Child Self-Report Measures of Wellbeing

Age 11: Child Self-report

The age 11 child self-report data are based on six items originally developed for the *Understanding Society* survey Youth Questionnaire: 'In the last four weeks, how often did you 'feel happy?', 'get worried about what would happen to you?', 'feel sad?', 'feel afraid or scared?', 'laugh?', 'get angry?'. Response options were: (1) 'never'; (2) 'almost never'; (3) 'sometimes'; (4) 'often'; (5) 'almost always'. The scale demonstrated reasonable internal consistency (alpha = 0.69). There are no established cut-points for the scale. Child self-report data were available at age 11 for 400 children with learning disabilities (78% of participating children) and 13,456 children without learning disabilities (94% of participating children).

Age 14: Short-Form Mood and Feelings Questionnaire (SF-MFQ)

The SF-MFQ was included in MCS Wave 6 (age 14). It is a 13-item questionnaire designed to screen for depression in children and adolescents.⁴⁴ While two studies have suggested using a cut-off of eight or higher for major depression,^{44, 45} sensitivity (ranging from 60%-75%) and specificity (ranging from 74%-85%) are less than optimal. In addition, this cut-off identifies 28.5% (95% CI 27.2% to 29.8%) of children at risk of major depression compared to an estimated population prevalence among 11-16 year old children in the UK of 1.4%.⁴³ Child self-report data were available at age 14 for 272 children with learning disabilities (73% of participating children) and 9,311 children without learning disabilities (94% of participating children).

Approach to Analysis

All analyses were restricted to a subsample in which SDQ data was completed by the child's biological mother and, for households in which more than one child was born in the MCS sampling window, the first named child. By restricting data to that which was completed by the child's biological mother we sought to reduce potential biases associated with different informants. In all waves, by far the most common adult informant was the child's biological mother (e.g., for 88% of children at age 3). By restricting data to one child per household we avoided bias in the calculation of standard errors due to clustering within families.

All analyses were undertaken in IBM SPSS 24 using sample weights provided with the data to address known biases resulting from differential recruitment rates and attrition over time. All analyses were undertaken on participants for who complete SDQ data was available (i.e., no missing SDQ data were imputed).

FINDINGS

The Association between Learning Disability and SDQ Scores

Mean scale scores are presented in Table 2 for children with and without learning disabilities at each wave of data collection. Consistent with available evidence,⁴⁶ SDQ data indicated that children with learning disabilities were more likely than their peers to show emotional and behavioural difficulties at all ages.

Table 2: Mean SDQ Scale Scores for Children with and without Learning Disabilities			
	Children with learning disabilities	Children without learning disabilities	Statistical significance of difference (Mann-Whitney z)
Age 3			
Conduct difficulties	3.74	2.76	z=7.98, p<0.001
Emotional difficulties	2.10	1.33	z=8.42, p<0.001
Hyperactivity/Inattention	5.60	3.85	z=13.04, p<0.001
Peer Problems	2.32	1.49	z=9.25, p<0.001
Pro-social behaviour	6.84	7.37	z=4.40, p<0.001
Total difficulties	13.79	9.37	z=14.28, p<0.001
Age 5			
Conduct difficulties	2.53	1.46	z=11.79, p<0.001
Emotional difficulties	2.28	1.33	z=9.76, p<0.001
Hyperactivity/Inattention	5.33	3.32	z=15.86, p<0.001
Peer Problems	1.96	1.39	z=14.71, p<0.001
Pro-social behaviour	7.64	8.41	z=8.10, p<0.001
Total difficulties	12.35	7.05	z=16.99, p<0.001
Age 7			
Conduct difficulties	2.67	1.39	z=14.33, p<0.001
Emotional difficulties	2.67	1.51	z=11.45, p<0.001
Hyperactivity/Inattention	5.61	3.34	z=14.77, p<0.001
Peer Problems	2.59	1.19	z=13.82, p<0.001
Pro-social behaviour	7.68	8.60	z=8.57, p<0.001
Total difficulties	13.39	7.42	z=17.17, p<0.001
Age 11			
Conduct difficulties	2.55	1.45	z=13.44, p<0.001
Emotional difficulties	3.29	1.88	z=12.98, p<0.001
Hyperactivity/Inattention	5.37	1.36	z=16.90, p<0.001
Peer Problems	2.86	1.38	z=16.24, p<0.001
Pro-social behaviour	8.05	8.75	z=7.91, p<0.001
Total difficulties	14.06	7.86	z=18.65, p<0.001
Age 14			
Conduct difficulties	2.43	1.53	z=7.67, p<0.001
Emotional difficulties	3.31	2.09	z=9.37, p<0.001
Hyperactivity/Inattention	4.78	3.13	z=11.24, p<0.001
Peer Problems	2.95	1.81	z=9.82, p<0.001

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Pro-social behaviour	7.55	8.23	$z=5.58, p<0.001$
Total difficulties	13.48	8.54	$z=12.81, p<0.001$

We undertook two subgroup analyses to examine the extent to which severity of emotional and behavioural difficulties varied by severity of learning disability. First, we examined severity of emotional and behavioural difficulties across the three tercile groups.

- At age three, there was a significant association between severity of learning disabilities and the hyperactivity scale score.
- At age five, there were significant associations between severity of learning disabilities and severity of emotional and behavioural difficulties for all SDQ subscale scores and Total score.
- At age seven, there were significant associations between severity of learning disabilities and severity of emotional and behavioural difficulties for the Total score and all but the emotional difficulties subscale.
- At age eleven, there were significant associations between severity of learning disabilities and severity of emotional and behavioural difficulties for the Total score and hyperactivity and peer problems subscales.
- At age fourteen, there was a significant association between severity of learning disabilities and severity of emotional and behavioural difficulties for just the conduct difficulties subscale.

In most instances increased severity of learning disabilities was associated with increased severity of emotional and behavioural difficulties.

Second, we examined severity of emotional and behavioural difficulties across the two 'more conventional' learning disability groups (estimated IQ <55 vs. IQ 55-69).

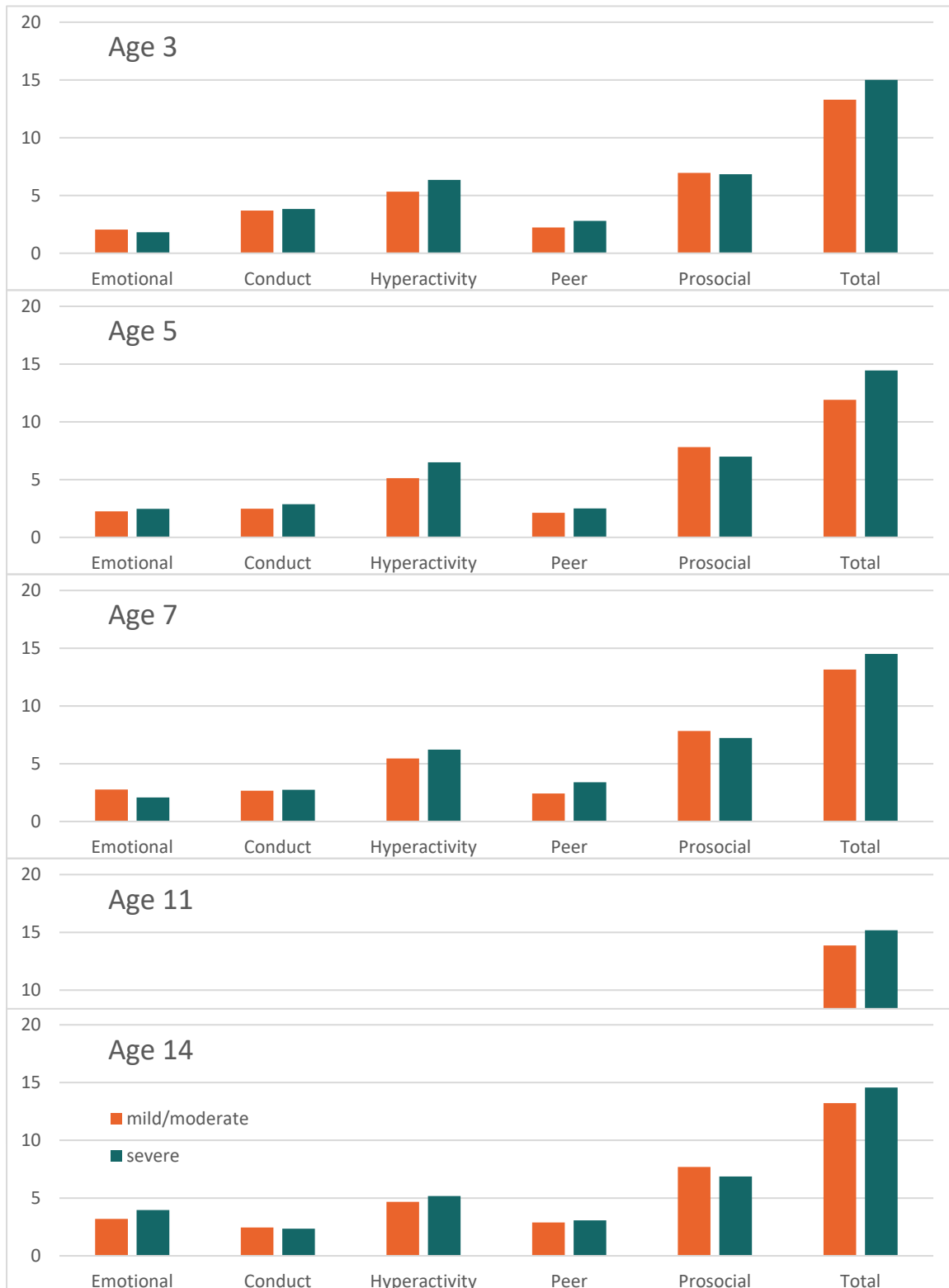
- At age three, there were significant associations between severity of learning disabilities and severity of emotional and behavioural difficulties for the hyperactivity and peer problems subscales.
- At age five there were significant associations between severity of learning disabilities and severity of emotional and behavioural difficulties for the hyperactivity and pro-social subscales and the Total score.
- At age seven, there was a significant association between severity of learning disabilities and severity of emotional and behavioural difficulties for just the peer problems subscale.
- At age eleven, there were significant associations between severity of learning disabilities and severity of emotional and behavioural difficulties for the peer problems and pro-social subscales.
- At age fourteen, there was a significant association between severity of learning disabilities and severity of emotional and behavioural difficulties for just the prosocial behaviour subscale.

In all instances increased severity of learning disabilities was associated with increased severity of emotional and behavioural difficulties. These differences are illustrated in Figure 1.

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Figure 1: Mean scale scores for children with mild/moderate and severe learning disabilities



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Impact scores are presented in Table 3 for children with and without learning disabilities at each wave of data collection. These data indicated that the parents of children with learning disabilities were more likely than their peers to report that their child's behaviour had a detrimental impact on their functioning and were associated with greater family burden.

We again undertook two subgroup analyses to examine the extent to which severity of emotional and behavioural difficulties varied by severity of learning disability. First, we examined severity of emotional and behavioural difficulties across the three tercile groups.

- At age three, there were significant associations between severity of learning disabilities and duration of emotional and behavioural difficulties.
- At age five, there were significant associations between severity of learning disabilities and severity of emotional and behavioural difficulties and impact on learning.
- At age seven, there were significant associations between severity of learning disabilities and severity of emotional and behavioural difficulties, impact on learning and impact on leisure activities.

In all instances increased severity of learning disabilities was associated with increased severity of emotional and behavioural difficulties.

Second, we examined severity of emotional and behavioural difficulties across the two 'more conventional' learning disability groups (estimated IQ <55 vs. IQ 55-69).

- At ages three and five, there were significant associations between severity of learning disabilities and severity of emotional and behavioural difficulties, duration of difficulties and impact on learning.
- At age seven, there was a significant association between severity of learning disabilities and severity of emotional and behavioural difficulties and impact on friendships, learning and leisure activities.

In all instances increased severity of learning disabilities was associated with increased severity of emotional and behavioural difficulties.

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Table 3: SDQ Impact Scores for Children with and without Learning Disabilities

	Children with learning disabilities	Children without learning disabilities	Statistical significance of difference (Mann-Whitney z for full ordinal scale)
Age 3			
<i>Severity of difficulties (% severe difficulties)</i>	2.6%	0.4%	z=13.65, p<0.001
<i>Duration of difficulties (% > 1 year)</i>	47.4%	35.0%	z=3.17, p<0.01
<i>Difficulties upset or distress child (% a great deal)</i>	3.6%	1.9%	z=0.51, n.s.
<i>Difficulties interfere with child's everyday activities in (% a great deal)</i>			
<i>Home life</i>	3.5%	1.2%	z=2.19, p<0.05
<i>Friendships</i>	5.3%	1.6%	z=2.54, p<0.05
<i>Learning</i>	14.0%	1.9%	z=7.95, p<0.001
<i>Leisure activities</i>	3.6%	1.0%	z=4.75, p<0.001
<i>Difficulties put a burden on family (% a great deal)</i>	5.9%	2.9%	z=2.71, p<0.01
Age 5			
<i>Severity of difficulties (% severe difficulties)</i>	5.9%	0.6%	z=16.63, p<0.001
<i>Duration of difficulties (% > 1 year)</i>	68.8%	56.2%	z=2.56, p<0.05
<i>Difficulties upset or distress child (% a great deal)</i>	8.8%	2.0%	z=4.95, p<0.001
<i>Difficulties interfere with child's everyday activities in (% a great deal)</i>			
<i>Home life</i>	8.3%	1.6%	z=4.85, p<0.001
<i>Friendships</i>	8.7%	2.0%	z=7.66, p<0.001
<i>Learning</i>	16.7%	3.0%	z=9.56, p<0.001
<i>Leisure activities</i>	7.8%	1.6%	z=7.78, p<0.001
<i>Difficulties put a burden on family (% a great deal)</i>	8.0%	2.4%	z=5.76, p<0.001
Age 7			
<i>Severity of difficulties (% severe difficulties)</i>	11.1%	1.1%	z=18.11, p<0.001
<i>Duration of difficulties (% > 1 year)</i>	81.5%	68.1%	z=4.10, p<0.001
<i>Difficulties upset or distress child (% a great deal)</i>	8.8%	3.3%	z=6.52, p<0.001
<i>Difficulties interfere with child's everyday activities in (% a great deal)</i>			
<i>Home life</i>	8.8%	2.2%	z=4.92, p<0.001
<i>Friendships</i>	13.5%	2.9%	z=5.78, p<0.001
<i>Learning</i>	20.5%	5.4%	z=11.76, p<0.001
<i>Leisure activities</i>	9.4%	2.0%	z=6.30, p<0.001
<i>Difficulties put a burden on family (% a great deal)</i>	10.7%	3.7%	z=5.15, p<0.001

The Factorial Structure of the SDQ

In order to investigate potential differences in the factorial structure of the SDQ when applied to children with learning disabilities we used principal components analysis with varimax factor rotation to extract five factors from the available data on children with and without learning disabilities at each age. In the following table we report a simple metric, the percentage of items that had their highest factor loading on the intended factor.

Table 4: Factorial Structure of Maternal Completed SDQ at Child Ages 3, 5, 7, 11 and 14			
	% of 25 items loading most heavily on the intended factor		Comments
Age	Children with learning disabilities	Other children	
3	80%	84%	For children with and without learning disabilities all items on the <i>Pro-social Behaviour</i> subscale loaded on the intended factor. For children without learning disabilities all items on the <i>Emotional Difficulties</i> subscale loaded on the intended factor. For children with learning disabilities all items on the <i>Hyperactivity/Inattention</i> subscale loaded on the intended factor.
5	64%*	92%*	For children with and without learning disabilities all items on the <i>Hyperactivity/Inattention</i> and <i>Pro-social Behaviour</i> subscales loaded on the intended factor. For children without learning disabilities all items on the <i>Emotional Difficulties</i> and <i>Peer Problems</i> subscales loaded on the intended factor.
7	84%	92%	For children with and without learning disabilities all items on the <i>Emotional Difficulties</i> and <i>Pro-social Behaviour</i> subscales loaded on the intended factor. For children without learning disabilities all items on the <i>Hyperactivity/Inattention</i> and <i>Peer Problems</i> subscales loaded on the intended factor.
11	64%*	96%*	For children with and without learning disabilities all items on the <i>Pro-social Behaviour</i> subscale loaded on the intended factor. For children without learning disabilities all items on the <i>Hyperactivity/Inattention</i> , <i>Peer Problems</i> and <i>Emotional Difficulties</i> subscales loaded on the intended factor.
14	64%*	96%*	For children without learning disabilities all items on the <i>Hyperactivity/Inattention</i> , <i>Peer Problems</i> , <i>Pro-social Behaviour</i> and <i>Emotional Difficulties</i> subscales loaded on the intended factor.

Table Notes: * denotes a statistically significant difference between percentages between children with and without learning disabilities;

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The analyses undertaken suggest that the factorial structure of the SDQ may be less stable for children with learning disabilities. However, while there is no clear consensus on the minimum required sample size to attain stable results in factor analysis, stability of solutions does increase with larger sample sizes. Given this we repeated the analyses for children without learning disabilities on a randomly selected sub-sample equivalent to the sample size of children with learning disabilities. In these analyses the percentage of the 25 items loading most heavily on the intended factor was reduced to 80% at age 3, 76% at age 5, 80% at age 7, 76% at age 11 and 92% at age 14. In this set of analyses there would only have been a statistically significant difference between children with and without learning disabilities at one of the five ages (age 14). Given the relatively small number of participants with learning disability, it was not viable to undertake factor analyses for subgroups of children with differing severity of learning disability.

Conclusion

The analyses undertaken suggest that the factorial structure of the SDQ may be less stable for children with learning disabilities. However, this may simply reflect the much smaller sample sizes of children with learning disabilities. At a more general level it is notable that in none of these analyses did all five of the items of the *Conduct Difficulties* subscale load primarily on the same factor.

The Internal Consistency of SDQ Scales

Internal consistency is an assessment of how reliably test items measure a specific construct that is considered to underlie scales such as the SDQ. Cronbach's alpha is one of the most commonly used measures of internal consistency. There is a consensus that an alpha value of 0.60 represents the minimal accepted level of internal consistency for psychometric scales. Confidence intervals for alpha were estimated using the programme available at <https://www.psychtc.org/stats/R/Feldt1.html>

Table 5: Internal Consistency (Cronbach's Alpha with 95% Confidence Intervals) of Maternal Completed SDQ Scales at Child Ages 3, 5, 7, 11 and 14

	Children with learning disabilities	Other children
Age 3		
Total problems	0.77 (0.72-0.81)	0.78 (0.77-0.78)
Conduct difficulties	0.69 (0.63-0.74)	0.69 (0.68-0.70)
Emotional difficulties	0.55 (0.46-0.62)	0.50 (0.49-0.52)
Hyperactivity	0.71 (0.66-0.76)	0.71 (0.70-0.72)
Peer Problems	0.43 (0.32-0.53)#	0.47 (0.45-0.48)#
Pro-social behaviour	0.70 (0.64-0.75)	0.66 (0.65-0.67)
Age 5		
Total problems	0.82 (0.79-0.85)	0.79 (0.78-0.79)
Conduct difficulties	0.67 (0.61-0.72)*	0.55 (0.53-0.56)*#
Emotional difficulties	0.63 (0.58-0.69)	0.59 (0.58-0.60)
Hyperactivity	0.77 (0.74-0.81)	0.77 (0.76-0.77)
Peer Problems	0.56 (0.48-0.62)	0.51 (0.50-0.53)#
Pro-social behaviour	0.70 (0.65-0.74)	0.67 (0.66-0.68)
Age 7		
Total problems	0.85 (0.82-0.88)	0.82 (0.82-0.83)
Conduct difficulties	0.61 (0.55-0.67)	0.61 (0.60-0.62)
Emotional difficulties	0.68 (0.63-0.73)	0.65 (0.64-0.66)
Hyperactivity	0.81 (0.78-0.84)	0.79 (0.78-0.79)
Peer Problems	0.62 (0.58-0.65)	0.58 (0.56-0.59)#
Pro-social behaviour	0.76 (0.72-0.80)*	0.70 (0.69-0.71)*
Age 11		
Total problems	0.85 (0.83-0.87)	0.85 (0.84-0.85)
Conduct difficulties	0.63 (0.57-0.68)	0.64 (0.63-0.65)
Emotional difficulties	0.72 (0.67-0.76)	0.72 (0.71-0.72)
Hyperactivity	0.76 (0.72-0.79)	0.79 (0.79-0.80)
Peer Problems	0.61 (0.55-0.67)	0.65 (0.64-0.66)
Pro-social behaviour	0.72 (0.67-0.76)	0.67 (0.66-0.68)
Age 14		
Total problems	0.78 (0.72-0.83)	0.79 (0.78-0.79)
Conduct difficulties	0.70 (0.64-0.75)*	0.62 (0.61-0.63)*
Emotional difficulties	0.74 (0.70-0.79)	0.73 (0.73-0.74)
Hyperactivity	0.56 (0.45-0.65)*	0.68 (0.66-0.69)*
Peer Problems	0.56 (0.48-0.64)	0.57 (0.56-0.59)#
Pro-social behaviour	0.75 (0.71-0.79)	0.74 (0.73-0.74)

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Table Notes: * denotes a statistically significant difference between alpha levels between children with and without learning disabilities; # denotes an alpha level significantly below minimum acceptable value.

In 4 of the 30 comparisons (13%) there were statistically significant differences in the internal consistency of SDQ scales between children with and without learning disabilities. In three of these instances internal consistency was significantly *greater* among children with learning disabilities.

In 6 of the 60 analyses (10%) internal consistency (primarily of the *Peer Problems* sub-scale) was significantly lower than the consensus level of 0.60. In five of these six instances this was for children without learning disabilities.

We repeated these analyses among children with learning disabilities separately for children with least severe, moderately severe and most severe disabilities. The purpose of this exercise was to assess whether internal consistency would be lower among children with more severe learning disabilities. We considered internal consistency to be low if two criteria were met: (1) internal consistency in the three groups systematically declined as severity increased; (2) the difference in internal consistency between the 'least severe' and 'most severe' groups was statistically significant ($p < 0.05$). The first criterion was met in 5 of the 30 analyses. The second criterion was met in two of these five instances. It is worth noting that a reverse pattern of results (internal consistency increasing as severity of learning disability increased) was met in 8 of the 30 analyses, with the second criterion being met in one of these six analyses.

Conclusion

It has been suggested that the pattern of emotional and behavioural difficulties may be different among children and young people with learning disabilities when compared to their peers and, consequently, that scales developed for the general population may not be applicable to children and young people with learning disabilities. The analyses undertaken in this and the previous section provide no evidence to support this suggestion. At a more general level it is notable that at four of the five ages the internal consistency of the *Peer Problems* subscale failed to reach minimal accepted level of internal consistency for a psychometric scale.

Agreement between Maternal and Teacher SDQ Ratings

We examined the association (Spearman's r) between maternally completed and teacher completed SDQ scores at ages 7 and 11. Additional analyses indicated no systematic relationship between severity of learning disability and levels of mother-teacher agreement.

Table 6: Association (Spearman's r) between Maternally Completed and Teacher Completed SDQ Scale Scores for Children with and without Learning Disabilities

	Children with learning disabilities	Children without learning disabilities	Statistical significance of difference between correlation coefficients
Age 7			
Total problems	0.422	0.407	$z=0.26$, n.s.
Conduct difficulties	0.432	0.280	$z=2.51$, $p<0.05$
Emotional difficulties	0.210	0.222	$z=0.18$, n.s.
Hyperactivity	0.327	0.449	$z=2.07$, $p<0.05$
Peer Problems	0.412	0.241	$z=1.76$, n.s.
Pro-social behaviour	0.122	0.236	$z=1.69$, n.s.
Age 11			
Total problems	0.433	0.463	$z=0.58$, n.s.
Conduct difficulties	0.352	0.330	$z=0.39$, n.s.
Emotional difficulties	0.195	0.306	$z=1.85$, n.s.
Hyperactivity	0.438	0.459	$z=0.41$, n.s.
Peer Problems	0.310	0.357	$z=0.82$, n.s.
Pro-social behaviour	0.131	0.261	$z=2.11$, $p<0.05$.

Conclusion

Consistent with the results of previous research, the association between maternal report and teacher report of emotional and behavioural difficulties were weak to modest.⁴⁷ There were no systematic differences in the strength of these associations between children with and without learning disabilities.

Agreement between Maternal SDQ Ratings and Child Self-Report

We examined the association (Spearman’s r) between maternally completed SDQ scores on the *Emotional Difficulties* subscale with child self-report of emotional difficulties at ages 11 and 14. Given that the group of children with learning disabilities had a greater proportion of boys, we undertook additional analyses stratified by gender. Additional analyses indicated no systematic relationship between severity of learning disability and levels of mother-child agreement.

Table 7: Association (Spearman’s r) between SDQ Emotional Difficulties Scale Scores and Child Self-Report of Emotional Difficulties for Children with and without Learning Disabilities

	Children with learning disabilities	Children without learning disabilities	Statistical significance of difference between correlation coefficients
Age 11			
Overall	0.043	0.223	$z=3.45, p<0.001$
Girls	0.213	-0.071	$z=3.35, p<0.001$
Boys	0.123	0.236	$z=1.71, n.s.$
Age 14			
Overall	0.066	0.249	$z=2.86, p<0.01$
Girls	0.016	0.261	$z=2.45, p<0.05$
Boys	0.214	0.174	$z=-0.52, n.s.$

Conclusion

Consistent with the results of previous research, the association between maternal report and child self-report of emotional difficulties was weak.⁴⁸ Overall, the association was stronger for children without learning disabilities. However, this difference was only apparent for girls. For boys there was no statistically significant difference between the strength of maternal report and child self-report.

DISCUSSION

It has been suggested that the pattern of emotional and behavioural difficulties may be different among children and young people with learning disabilities when compared to their peers. Therefore, it has been argued that scales developed for the general population may not be applicable to children and young people with learning disabilities, especially those with more severe learning disabilities.¹

The aim of this report was to present new data, extracted from the UK's Millennium Cohort Study, on the face validity, factorial structure and reliability of the SDQ when used with children with learning disabilities.

Face Validity

There is relatively robust evidence that: (1) a wide range of emotional and behavioural difficulties are more common among children with learning disabilities when compared with their peers;^{46, 49, 50} and (2) that these difficulties are associated with increased family burden.⁵¹ The analyses of SDQ data presented in this report (including subscale scores and result of the impact supplement) are fully consistent with this existing literature.

Factorial Structure and Reliability

- The analyses undertaken do suggest that the factorial structure of the SDQ may be less stable for children with learning disabilities. However, this may also simply reflect the much smaller sample sizes available for children with learning disabilities.
- There were no systematic differences in the internal consistency of the SDQ scales between children with and without learning disabilities.
- Consistent with the results of previous research, the association between maternal report and teacher report of emotional and behavioural difficulties were weak to modest.⁴⁷ There were no systematic differences in the strength of these associations between children with and without learning disabilities.
- Consistent with the results of previous research, the association between maternal report and child self-report of emotional and behavioural difficulties was weak.⁴⁸ Overall, the association was stronger for children without learning disabilities. However, this difference was only apparent for girls.
- Among children with learning disabilities there was very little evidence that key psychometric characteristics of the SDQ vary by severity of learning disability in the sample.

Strengths and Limitations

The main strength of the analyses presented in this report is that they are based on a large sample of children with and without learning disabilities which is representative of children who are currently growing up in the UK.

The two main limitations of these analyses are:

1. The sample contains too few children with severe or profound levels of learning disability to allow disaggregation of data by commonly recognised categories of severity;
2. The classification system used is based on evidence of impaired cognitive functioning, an approach which is consistent with the ICD-10 definition of 'mental retardation'.³⁵ However, the ICD-11 definition of 'disorders of intellectual development' also contains criteria based on adaptive behaviour or functioning.³⁶ As such the classification system used in this report may be overinclusive when compared against ICD-11 criteria.

Conclusion

We found little evidence to support the contention that the parent completed SDQ may not be applicable to children and young people with learning disabilities, including those with more severe disabilities in the sample.

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