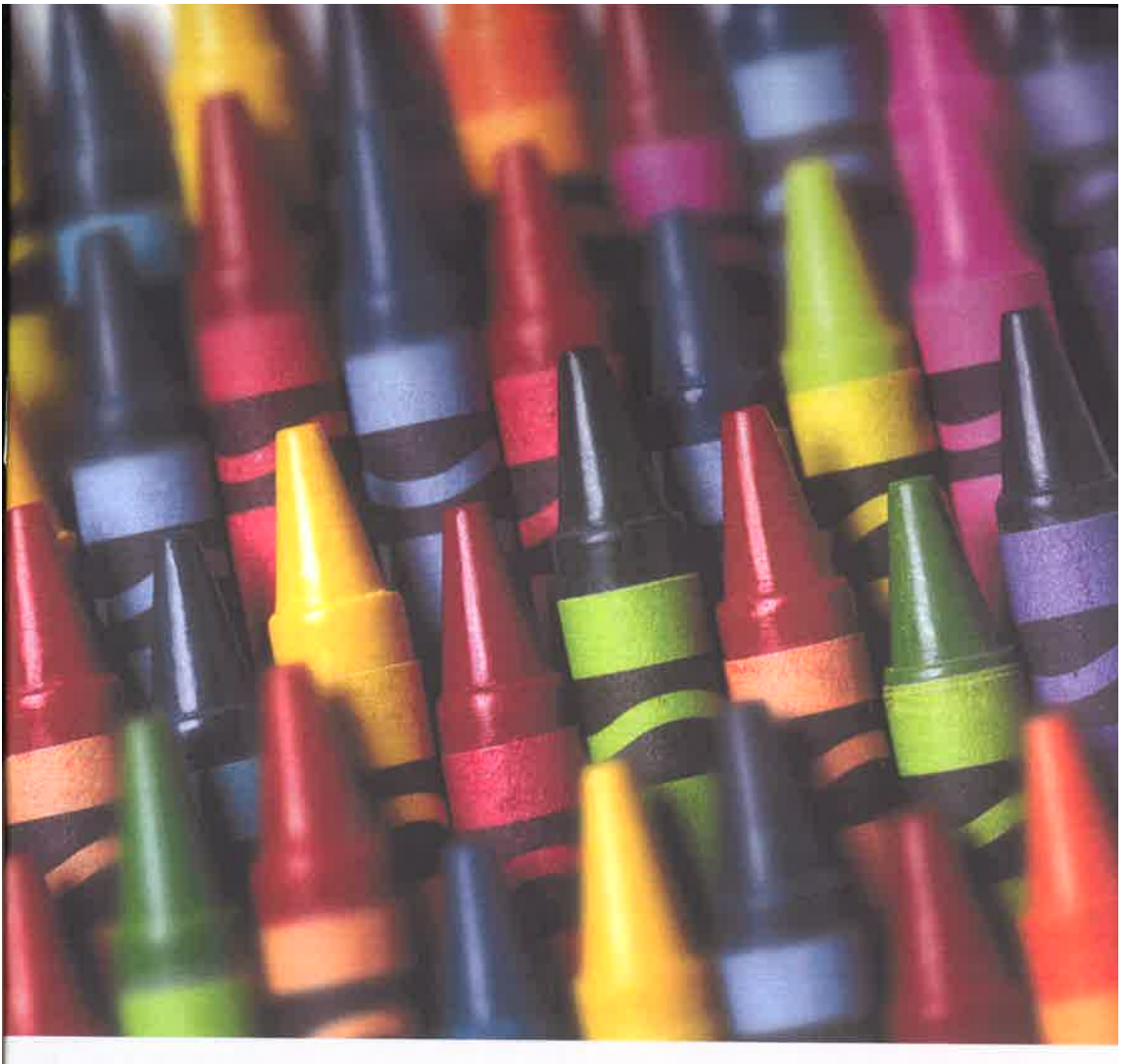

The Children's Communication Checklist

Second Edition
CCC-2 Manual

By D.V.M. Bishop
Department of Experimental Psychology
University of Oxford

Pearson

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Published by Pearson Assessment, 80 Strand, London WC2R 0RL.

Printed in the United Kingdom.

ISBN 978 0 749126 00 1

17 18 19 20 G H

Figures

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Acknowledgments

Development of CCC-2 was made possible by the generous co-operation of numerous schools and nurseries throughout the United Kingdom. Particular thanks are due to the parents who completed the CCC-2 to provide normative and validation data.

Staff at the following training establishments provided invaluable support in assisting with recruitment of student testers: Department of Speech and Language Therapy, University of Central England; Centre for Speech and Language Therapy, University of Wales Institute, Cardiff; Department of Language and Communication Science, City University, London; Department of Speech and Language Sciences, Queen Margaret College, Edinburgh; Department of Linguistic Sciences, University of Reading; Human Communication Sciences, University of Sheffield.

The following student testers participated in data collection: Lynne Fiona Adams, Sara Bullock, Camilla Byrne, Hannah Clarke, Sarah Deane, Julie Ellis, Julie Faulkner, Eleana George, Jo Hawke, Ashlyn Hayes, Katie Hazael, Michelle Isaac, Louise Karbownicki, Sally Matthew, Helen McEwan, Janna Owens, Pauline Penman, Aaron Pond, Karen Powell, Joanne Quinlan, Charlotte Rowe, Rebecca Russell, Mary Sayers, Rebecca Smith, Kate Souchard, Sarah Staunton, Gemma Wilson, Abbie Withington, Mary Woodward, Sarah Wright.

Additional validation data were collected by Ms Courtenay Norbury (University of Oxford), Dr Marysia Nash (Speech and Language Therapist, Royal Hospital for Sick Children, Edinburgh), Dr Kristina Herden (University of York), and Dr Gillian Baird (Newcomen Centre, Guy's Hospital, London).

Data from Australian children were collected with the assistance of student testers from the School of Human Communication Science at Curtin University of Technology, Western Australia, under the co-ordination of Miss Diane Franklin, speech pathology clinical supervisor. The following students assisted in data collection: Anna Turnell, Lydia Varughese, Julia Wingrove, Lakdini Geevarante, Jane Moore and Trudy Lynch.

Assistance with data entry was provided by Uwe Schönberger and Faith Ayre, and we thank them for their careful work.

Particular thanks are due to colleagues at the University of Oxford: Dr Marina Rose, who acted as research co-ordinator during the recruitment and data collection phase of the project, Mrs Faith Ayre, who supplied invaluable administrative assistance, and Ms Courtenay Norbury who collaborated on the validation of the CCC-2 and offered insightful comments on early drafts of the manual.

Thanks are also due to Lesley Munro from Pearson Assessment for her enthusiastic help in making the development of CCC-2 possible, and seeing it through the editorial process, and to the production team Sarah Weinberg and Patrick Gilbert.

1

Introduction

Introduction

Purposes of the CCC-2

- To screen for children who are likely to have a language impairment, and who should be referred for further evaluation by a speech and language therapist or psychologist.
- To identify pragmatic impairments in children with communication problems.
- To assist in identifying children who may merit further assessment for an autistic spectrum disorder.

Test rationale

The Children's Communication Checklist – Second Edition (CCC-2) is the latest version of a checklist that has been under development for 10 years. The main function of the CCC-2 is to obtain ratings of aspects of communication that are not easy to evaluate in more traditional one-to-one clinical assessment. There are many conventional tests that are useful for assessing aspects of language such as vocabulary size, syntactic complexity, comprehension of sentence structure and verbal memory. However, such instruments are not well suited to evaluating how the child uses language, or in identifying unusual features of communication such as stereotyped conversation or over-literal comprehension. In particular, traditional tests are largely insensitive to communicative problems that come under the domain of *pragmatics*, which may be defined as selection of the appropriate message or interpretation in relation to the communicative context (Bishop, 1997). Clinical accounts of language disorders have long recognised that, for some children, such difficulties are a major part of their communicative problem (Rapin & Allen, 1983; Bishop & Rosenbloom, 1987). However, by definition, pragmatic language impairments are dependent on context, and there is some evidence that they may be less apparent in the structured context of a clinical assessment than in everyday life (Bishop & Adams, 1991). To get a realistic impression of a child's pragmatic abilities, one needs information from someone who has the opportunity to observe the child frequently over a long period of time. The CCC-2 is designed to be completed by an adult who has regular contact with the child – typically a parent.

Test description

The CCC-2 consists of 70 multiple choice items and takes approximately 5-15 minutes to complete. Items are divided into 10 scales (see Table 1.1), each with seven items. For each scale, five items describe difficulties, and two describe strengths. Items from different scales are interleaved, but all the 'difficulties' items are grouped together, with the 'strengths' items occurring in a block together at the end of the checklist. The response format of the CCC-2 differs from that of previous versions in that the respondent is asked to give a rating reflecting the frequency with which different behaviours are observed.

Table 1.1. CCC-2 scales

A	speech	F	stereotyped language
B	syntax	G	use of context
C	semantics	H	nonverbal communication
D	coherence	I	social relations
E	inappropriate initiation	J	interests

The first four scales, A: speech, B: syntax, C: semantics and D: coherence, assess aspects of language structure, vocabulary and discourse. These are all areas that are often impaired in children with specific language impairment (SLI).

The next four scales, E: inappropriate initiation, F: stereotyped language, G: use of context, and H: nonverbal communication, cover pragmatic aspects of communication that are not readily assessed by conventional language assessments, but which may be deficient in children who do not have structural language difficulties (as well as in some who do).

The last two scales, I: social relations and J: interests, assess behaviours that are usually impaired in cases of autistic disorder. The reason for including these scales is because pragmatic impairment is a cardinal feature of autistic disorder (Lord & Paul, 1997). The CCC-2 cannot be used to diagnose autistic disorder, but a finding of disproportionately low scores on the scales assessing pragmatics, plus evidence of impairment on scales I and J would suggest one should seek a more detailed evaluation to consider a possible diagnosis of an autistic spectrum disorder.

In screening contexts, the General Communication Composite (GCC), based on the first eight CCC-2 scales, may be used to identify children likely to have clinically significant communication problems. It is also possible to derive a Social Interaction Deviance Composite (SIDC), which reflects the mismatch between the sums of scales E, H, I and J and the sum of scales A, B, C and D. This composite can help identify children with a communicative profile characteristic of autism. The computation of these composites is described in Chapter 2, and the rationale for their development is covered in Chapter 4.

Client groups and uses

The CCC-2 is intended for use with children aged 4 years and over who speak in sentences. It is not suitable for children who are non-verbal or who speak in one- or two-word utterances. The norms are based on children attending mainstream schools in the United Kingdom who come from English-speaking homes and may not be suitable for children from other cultural backgrounds.

Although the early versions of the CCC were used only with children who already had identified language problems, subsequent research has shown that it can provide useful diagnostic information for other clinical groups, including children referred for psychiatric or neurological evaluation (Bishop & Baird, 2001).

Respondents

The CCC-2 is usually completed by a parent, although it can be completed by any adult who has had regular contact with the child for at least 3-4 days per week for at least 3 months. All the early research on pre-publication versions of the CCC was done using teachers or speech and language therapists as respondents. However, subsequent research showed that most parents had no difficulty in completing the CCC items and their ratings accurately reflected the child's diagnosis (Bishop & Baird, 2001). The normative data on the CCC-2 come from parents reporting on their children.

An advantage of using parents as respondents is that they are likely to have much more opportunity than professionals to observe their child in a wide range of different contexts. However, it is important to be alert to the possibility that parents may have poor language or literacy skills that make it difficult for them to comprehend all the questions on the CCC-2. Readability statistics indicate that the CCC-2 can be completed by someone who has a reading level of 12 years or over (Flesch-Kincaid Grade Level = 7.1).

It can be particularly helpful to ask parents to complete the CCC-2 before their child is seen for assessment, as the information they provide can identify areas of concern and guide the assessment process.

Professional users

The CCC-2 is designed to be interpreted by speech and language therapists, psychologists and paediatricians.

Interpretation of scores

Normative data are provided from a standardisation sample of UK children aged from 4 to 16 years attending mainstream schools. These are the basis for the lookup tables provided in Appendix 3A, which allow raw scores for each scale to be converted to age scaled scores. These can be used to identify children whose scores fall outside the normal range for their age.

In addition, background data are available from clinical samples of children with communication problems, including autistic disorder. These have been used to illustrate profiles of impairment seen in different diagnostic groups, and to devise an index, the Social Interaction Deviance Composite, that is sensitive to the pattern of communication difficulties characteristic of autistic spectrum disorders.

More detailed information on scoring and interpretation of the CCC-2 is given in Chapter 2.

Use of the CCC-2 with adults

The wording of some items on the CCC-2 is not suitable for adults, and the title "Children's Communication Checklist" makes it inappropriate. However, there are a number of conditions affecting adults in which pragmatic skills may be affected, including genetic disorders such as Fragile X syndrome or Williams syndrome, or acquired conditions such as damage to the right cerebral hemisphere, or to the frontal lobes. One can also envisage circumstances when it might be useful to obtain information about pragmatic skills in people with psychiatric disorders such as schizophrenia or manic depression. At the time of publication, a modified version of the CCC-2 is being developed for use with those aged 17 years and over – this is known as the Communication Checklist for Adults, or CC-A.

2

Scoring and Interpreting the CCC-2

Scoring and Interpreting the CCC-2

Appendix 1 contains a sample completed CCC-2, and Appendix 2 shows a worked example of scoring this checklist.

Scoring by hand

The electronic scoresheet (see below) considerably simplifies the scoring procedure. However, there will be situations when automated scoring is not practical, in which case scoring can be achieved by hand. Using the completed checklist, the overlays provided, and a copy of the CCC-2 summary sheet, go through the following steps:

1 Start with the positive items, 51-70. For each scale, A to J, position the overlay for page 4 of the checklist so you just expose the items that fall on that scale, and enter the sums for each scale. For instance, the overlay reveals that items 51 and 58 belong to scale A, and so the sum score for these two items is entered in the first row of the first column (headed W). (The worked example in Appendix 2 shows correct scoring for the sample checklist in Appendix 1.)

2 If there are missing data on any item (i.e. it is blank) tally this in the column headed M (i.e. column M should contain a count of the number of items with missing data).

3 The direction of scoring for the 'strengths' items has to be reversed before they are added to the total. (In effect, a zero response is scored as 3, a one response as 2, a two response as 1, and a three response as zero.) Provided there are no missing values, the simplest way of doing this is to subtract each of the scale totals in column W from 6, and enter in the next column (headed Pos). However, if there are any missing values, you must subtract 3 from the Pos total for each missing value before entering it in the Pos column. This sounds more complicated than it is – see the worked example for an illustration. (Once you have made this correction for missing data, all following steps can be followed without any further adjustment.)

4 Add the Pos scores for all scales and record the total in the box labelled 'positive sum' at the foot of the column.

5 Now use the overlays for pages 2 and 3 to compute totals for columns X and Y.

6 Continue to keep a tally of the number of items with missing data in column M.

7 For each scale, add up columns X and Y and enter the total in the column titled Neg.

8 Add the Neg scores for all scales and record the total in the box labelled 'negative sum' at the foot of the Neg column.

9 Next you need to check that the data are internally consistent. If the positive sum is 30 or less, then any value of negative sum is acceptable and you can just check YES on the consistency check. If the value of positive sum is 31 or more, you need to use Appendix 3B to check that the data are internally consistent as follows: first find the row corresponding to 'positive sum' in the first column. The value for 'negative sum' should be greater than the value in the 2nd column. If the negative sum score is less than or equal to this value, it suggests the respondent did not understand how to use the CCC-2 and continued to use scores of 0-1 to denote language competence in the positive items. (This pattern was seen in 1.6% of respondents in the standardisation sample, and their data were excluded from the norms.) The CCC-2 is not valid in such cases, and you should not proceed any further with scoring. Assuming the internal consistency check is satisfactory, proceed to the next step.

10 For each scale, if there are no items with missing data, add together the Pos and Neg columns and put the total in the Sum column.

11 If there is a single item on a scale with missing data, then the Sum for that scale should be pro-rated by multiplying by 7/6. In such cases round down numbers with decimal values of less than .5, and round up those of .5 and above. For instance, if the total for Pos and Neg is 5, and there is one item with missing data, then the Sum is (5 x 7/6) = 5.83, which is rounded up to 6.

12 If the number of items with missing data, M, is 2 or more for any scale, then a score for that scale cannot be validly computed. Put a line through the Sum and Scaled Score columns for that scale.

13 Use Appendix 3A to convert the Sums to Scaled Scores.

14 The General Communication Composite (GCC) is the sum of the Scaled score values for scales A to H. This is entered in the cell at the bottom of the Scaled score column.

15 Appendix 3C provides information about the percentage of children in the standardisation sample who obtained scores on each scale at a given level. Thus to obtain the percentile equivalent of a given scaled score, you should first identify the scaled score in the left-hand column, and then read across to find the relevant percentile value for that scale.

16 Appendix 3D is used in a similar fashion to convert the General Communication Composite into a percentile.

17 The Social Interaction Deviance Composite (SIDC) is obtained by summing scales E, H, I and J, and then subtracting scales A, B, C and D. This composite may be a negative number. In the worked example, the SIDC is 23-9 = 14. The SIDC is not interpreted in terms of statistical abnormality. It provides qualitative information about the pattern of impairment, and is

primarily of use in research contexts, where one may want an objective method for subdividing children into subgroups. In a child with communication problems, values below 0 indicate a communicative style resembling that seen in autistic spectrum disorders, whereas a positive score is indicative of more specific difficulties that disproportionately affect structural language skills. Interpretation of the SIDC is described in Chapter 3.

Automated scoring

If you have access to a computer that runs Microsoft Office, the simplest way to score the CCC-2 is to use the Excel program provided on the CD that comes with the test manual. This will give you the total raw score and scaled score for each scale, and the two composites. It also allows you to print out a summary sheet for an individual case, giving percentiles as well as scaled scores. This summary can be saved and printed out.

Copy the Excel workbook entitled CCC-2 Scorer onto your computer. The workbook is set up for entering data from multiple cases, with one row for each case. N.B. Your computer may be set up so that you are asked whether Macros should be enabled when you open the sheet. The scoresheet will work with Macros disabled, but you will not be able to automatically hide/unhide columns, or create a summary sheet, unless you enable Macros.

The first row (row 8) contains demonstration data. You should overwrite this row once you start using the worksheet for your own data (N.B. this row cannot be deleted unless you unprotect the worksheet, which is not recommended). The easiest way to move from column to column when entering data is to use the Tab key.

First you need to enter some identifying information in columns A to C. Column A can be used for an identifier code or (if confidentiality is not an issue) the name or initials of the case. Columns B and C are optional and can be used for recording gender and diagnostic information, or a code that identifies which group the person belongs to. (The latter will be mainly of use in research contexts). Columns D and E are obligatory and are used for computing the child's age. The computation is done automatically, with the result recorded in column F. To facilitate data entry, it is best if this column, like other computation columns, is kept hidden. If column F is visible when you start data entry, it is recommended that you press ctrl+shift+H (holding down all three keys together) to run a macro which hides all the computation columns. (You can readily view them once you have entered the data by re-running the macro.)

Copy from the front page of the CCC-2 the information for columns G to K. For research purposes, you can use column L to code whether results from this case are valid – for instance, you might want to exclude cases who fail to meet your criteria for inclusion in a study.

Main data entry for individual items starts in column AW. If you have hidden the computation columns, as recommended above, then this is the next visible column. You simply type in 0, 1, 2 or 3 for each item, exactly as recorded by the respondent. Leave items blank if a response is missing.

Once you have finished entering data, you can view the computed scores. Press ctrl+shift+H to run the view/hide macro. Raw scale totals can be found in columns M to V. Scaled scores for individual scales are in columns W to AF. Composites are in columns AG and AH. The consistency check, with negative and positive sums on which it is based, is in column AI. Columns AL to AV show the proportion of items completed for each scale.

To create a summary sheet for a single case, click your mouse on the row corresponding to that case in column A. Then press ctrl+shift+S. This writes the results for that case onto the summary worksheet, and gives you the option of saving a copy of the summary worksheet in a new workbook. This can be printed out.

The spreadsheet is currently set up to allow data entry up to row 300. Users with some expertise in Excel, can, however, modify the worksheet to add further rows, as follows:

1. Unprotect the worksheet. (Tools|Protection|Unprotect sheet).
2. Ensure the computation columns are unhidden. Use the view/unhide macro until you can see column F and columns M through AV.
3. Unhide columns DO to EI. To do this select columns DN and EJ and select Format|Column|Unhide.
4. For all these computation columns (F, M through AV, DO through EI), you need to copy the formula from rows 8-300 to the additional rows you wish to use.
5. Check that for the new rows, cells in columns A to E, G to L, and AW to DN are unlocked: Format|Cells|Protection, uncheck the 'locked' box.
6. When you have finished, it is advisable to protect the sheet again: Tools|Protection|Protect Sheet. This prevents inadvertent alteration of the formulae.

N.B. If you plan to make copies of the CCC-2 Scorer spreadsheet, you need to be aware that the workbook includes macros as well as a hidden worksheet that is used in the summary macro for computation of percentiles. Therefore, you should always copy the whole workbook, rather than just making copies of individual sheets.

Interpretation

It is important to remember that the CCC-2 is a parent-completed checklist with just seven items forming each of its 10 scales. Our experience is that the CCC-2 can provide useful information in both clinical and research contexts, but, as with any questionnaire, responses will be influenced by the subjective views of the respondent. Furthermore, respondents may vary in their ability to understand the questions and their willingness to provide a thoughtful and accurate evaluation. Accordingly, it is not appropriate to base major diagnostic decisions on data from the CCC-2 alone. Rather, it should be used to inform the assessment process by identifying areas in need of further exploration and to provide information about communicative behaviour outside the more formal setting of child-based clinical assessment.

Clinicians vary in the criteria that they use to identify impairment. Some use a cutoff of one standard deviation (SD) below the population average, defining as impaired those who score below this level. This is a fairly liberal criterion that will select around one in every six children (16%) on a test with normally distributed data. However, the skew in CCC-2 data means that the proportions of children selected by given scaled score cutoffs tends to be higher, as can be seen from Appendix 3C. It is therefore recommended that, though scaled scores should be used in research contexts when one needs, for instance, to compare group means, in clinical contexts, the percentiles should be used.

When evaluating CCC-2 results, one needs to consider the pattern of scores across the different scales. Recommendations are as follows:

- Scores at or above the 15th percentile (corresponding roughly to a scaled score of 6) should be regarded as within normal limits.
- A score around the 10th percentile (roughly equivalent to a scaled score of 5) should not usually be a cause of concern if it is seen on only one or two scales. However, if more than three scales have scores this low, this suggests the child may warrant further investigation.
- If two or more scales have scores at or below the 5th percentile, this suggests the child has communicative problems of clinical significance.
- On the GCC, cutoffs at or below 54, 45 and 40 select the bottom 10%, 5% and 3% of children respectively (see Appendix 3D). Our validation data (see chapter 4) indicate that virtually all children with a diagnosis of SLI or autism obtain a GCC below 55.
- Scores below the 6th percentile on both scales I (social relationships) and J (interests) coupled with a GCC score below 55, suggest the possibility of an autistic spectrum disorder. If a child scores in this range, this suggests there should be a more detailed evaluation by a professional with expertise in the diagnosis of autistic disorder.
- The development of the SIDC is described in Chapter 4. This composite can be used to subgroup children with communication impairments, but would normally only be interpreted if the child obtains a score on the GCC below 55.

An exception is if the child obtains an SIDC of –15 or less: scores this extreme have clinical significance, insofar as they are rare in the normative sample, but frequently seen in children with Asperger's syndrome, even if the GCC is within normal limits. A particular use of the SIDC is in research contexts, where an objective index is required to subdivide children into those with a communicative profile characteristic of autistic disorder, as opposed to those with predominantly structural language difficulties. As discussed in chapter 4, the majority of children with a SIDC of 9 or more are regarded as having typical specific language impairment. In contrast, an SIDC less than 0 is virtually never seen in cases of typical SLI, but is common in those thought to have pragmatic language impairment, autism or Asperger's syndrome. There is a dearth of assessments sensitive to pragmatic impairment that can be used to validate the information from the SIDC. However, informal observation of the child, plus CCC-2 ratings from another independent observer (such as a teacher) will usually provide supportive information to supplement the parental CCC-2.

Interpretation when there are missing data

It is usually possible to get some useful information from the CCC-2 despite unchecked items (see chapter 2).

If more than two items are missing in any scale from A-H it is not possible to compute a GCC or SIDC score. Scrutinise the completed subscales for evidence of impairments. If these suggest a cause for concern, make an attempt to obtain a complete CCC-2 from another informant.

The presence of missing data is itself of interest, and merits further exploration. As noted in chapter 4, missing data were rare in the standardisation sample: 98% of parents either provided complete data, or omitted no more than two items. Our experience is that rates of missing data may be somewhat higher in clinical samples, and there are two possible reasons for this. One is that parents may be reluctant to report on specific behaviours, especially if they are concerned with how the information will be interpreted by the clinician. The other is that the parents may themselves have comprehension or literacy problems.

3

Development of the CCC-2

Development of the CCC-2

Historical background

Checklist for Language Impaired Children (CLIC and CLIC-2)

The first checklist devised by the author, the Checklist for Language Impaired Children (CLIC; first reported by Bishop, 2000, but developed before the CCC) was intended to be a research tool, and differed from the CCC-2 in three important respects:

- It was designed to provide objective means of identifying from within a language-impaired sample those children who had symptoms characteristic of "semantic-pragmatic disorder" (Bishop & Rosenbloom, 1987; Rapin & Allen, 1983).
- It contained only 20 multiple-choice items: the rater had to mark which of five descriptions best fitted the child in question.
- It was designed to be completed by teachers and therapists.

Experience with CLIC showed that the five-choice item format was unsatisfactory. Respondents often felt that no option really described the child – or that more than one response applied – and they sometimes annotated the response before selecting it, so altering its meaning. It was therefore decided to devise a new checklist, CLIC-2, in which the five choices offered in the old CLIC each formed a single new item, which the respondent had to rate as 'applies definitely', 'applies somewhat' or 'does not apply'. This response format was based on that used in the Rutter Scales (Rutter, Tizard & Whitmore, 1970), an instrument that is widely used in the field of developmental psychopathology.

A large-scale reliability with CLIC-2 was conducted with the help of teachers and therapists at special schools for language-impaired children. They were asked to complete checklists for the same children, without consulting together, so that agreement between independent raters could be assessed. In addition, diagnostic information was gathered from school records, making it possible to see how well CLIC-2 results agreed with diagnostic category. It was anticipated that CLIC-2 would identify from within the language-impaired population a subgroup of children with a classic profile of semantic-pragmatic disorder, i.e. impaired on items assessing pragmatic and semantic skills, but unimpaired on language structure, i.e., syntax and phonology. It was also expected that the other children in the sample would show the opposite pattern, with poor phonology and syntax, and good pragmatics. In fact, the picture was much less clearcut. Although it was the case that children with a diagnosis of semantic-pragmatic disorder tended to show the anticipated pattern, the data diverged from expectation in two respects:

- Many children had a combination of pragmatic and structural language problems, and there was no obvious discontinuity between these children and those with more restricted pragmatic impairments.

- Semantic items did not differentiate subtypes of children, but appeared to be common in all language-impaired children. Furthermore, although many items showed reasonable inter-rater reliability, others did not, and some items that were intended to measure the same general domain of functioning were poorly intercorrelated.

The Children's Communication Checklist (CCC)

The Children's Communication Checklist (CCC: Bishop 1998) was developed out of CLIC-2 by selecting those items with the highest inter-rater reliability, and regrouping these into new scales on the basis of the statistical criterion of internal consistency. This gave a checklist with nine scales: A: speech, B: syntax, C: inappropriate initiation, D: cohesion, E: stereotyped conversation, F: use of context, G: rapport, H: interests and I: social interaction. Items assessing prosody, semantics, attention and motor skills were mostly dropped because of low reliability, although a few of these items were incorporated into other scales, if they correlated well with the other items in the scale. Scales C to G were combined to form a pragmatic composite. Scales A and B covered aspects of speech and language structure that were expected to be poor in typical cases of SLI. Scales H and I were included to index aspects of nonverbal behaviour that characterise autistic behaviour, because of interest in the question of whether pragmatic impairments invariably go together with more pervasive problems in these other domains.

An initial study was conducted with the CCC using a subset of children who had participated in a national study of language-impaired 7-year-olds (Conti-Ramsden, Crutchley, & Botting, 1997). As in the previous study with CLIC, teachers and therapists of these children were asked to complete CCCs independently for the same children, making it possible to assess inter-rater agreement. Inter-rater reliability varied from scale to scale, but was good for the pragmatic composite (.80), and reasonable for the other scales. The CCC also appeared valid, in that it related coherently to diagnoses from children's school records. These were used to divide children into those who did and did not have a diagnosis of possible semantic-pragmatic disorder, with the latter subgroup further divided according to whether the child also had autistic features. Although there was a fair amount of overlap between groups, children with autistic features had the lowest mean pragmatic composite, the semantic-pragmatic group without autistic features came next, and the highest scores were obtained by those with no diagnosis of semantic-pragmatic disorder.

Up to this point, the CCC had been used only in the context for which it was originally designed, i.e. as a way of subclassifying children already known to have a communication impairment. However, publication of the 1998 paper led to a surge of interest in the possible wider application of the CCC, as a tool for screening for language impairment, and for identifying pragmatic impairments in children with psychiatric disorders. In addition, there was interest in the question of whether the CCC was applicable to a wider age range, and whether it would yield useful information if completed by parents rather than professionals.

A further study with the CCC was carried out in collaboration with Dr Gillian Baird, a developmental paediatrician at a tertiary referral centre in London (Bishop & Baird, 2001). The aim was to gather data on the CCC from an unselected sample of children aged from 5 to 16 years who were referred to the centre for diagnostic assessment. Two copies of the CCC were sent to parents with their letter of appointment, and they were asked to have the child's teacher or therapist complete one copy, and to complete the other themselves. Information from the CCC was subsequently related to the child's diagnosis and psychometric data. In addition, data on the CCC were collected from typically-developing children who were participating as controls in other studies. This study confirmed the utility of the CCC in this broader clinical context. Although parent-teacher agreement was not high (r = .45), both sets of ratings appeared valid, in that they showed clear association with the child's clinical diagnosis. Indeed, the parent ratings agreed rather better with diagnosis than did the teacher ratings. Furthermore, the scores for typically developing children barely showed any overlap with those from the clinical sample, suggesting that the CCC might be useful as a means of screening for communication problems, as well as for identifying pragmatic difficulties.

Differences between the CCC and the CCC-2

Format of items

Feedback from users of the CCC (both professionals and parents) suggested several problems with the multiple choice format, in which the respondent had to select from the options of 'applies definitely', 'applies somewhat', and 'does not apply'. One was the subjectivity of the judgement – one person's 'somewhat' may be another person's 'definitely'. Another problem was the mental confusion induced by items that included a negative statement (e.g. "seldom or never starts up a conversation; does not volunteer information about what has happened"). For a child who did not have this problem, the rating should be 'does not apply', but many respondents found the implicit double negative difficult to cope with.

The aim was to achieve better agreement between raters by making the response options more concrete and avoiding negatives. Hence in the CCC-2, ratings of frequency of occurrence of a given behaviour are made on a 4 point scale, as follows:

0. less than once a week (or never)

1. at least once a week, but not every day

2. once or twice a day

3. several times (more than twice) a day (or always).

One drawback to moving to this new format is that some items could not readily be reworded to fit it, and so had to be dropped. However, feedback from pilot trials with 40 parents confirmed that most people found this format easier to use and less ambiguous than the original CCC format.

Order of items

In the original CCC, items were grouped into scales, with 'strengths' and 'difficulties' items interspersed. This created problems for many respondents, who became confused by the fact that 'does not apply' could refer to a positive quality in the child for one item, but a negative quality on another. In the CCC-2, all 'difficulties' items are grouped together at the start of the checklist. The 'strengths' items are provided at the end of the checklist, and are prefaced by an explanatory statement.

Scales

The CCC had 9 scales, each based on between 4 to 10 items. Some scales included 'strengths' items, and others did not. In part, this imbalance between scales arose because items had been dropped because of low reliability, or reassigned from one scale to another on the basis of internal consistency. However, if one aims to look at the profiles on different scales, it is preferable if they are more similar in composition, as this will affect psychometric properties. Hence, the goal in designing the CCC-2 was to have equal numbers of items for each scale, with each having two 'strengths' items as well as five 'difficulties' items.

Earlier versions of the CCC gave only brief coverage to aspects of language that are included in traditional language assessments. CCC had only four items in the syntax scale, and items concerned with semantics had been dropped altogether because of low reliability. However, experience with the CCC suggested that there could be considerable advantage in enhancing coverage of these aspects of language, in that it might allow the CCC-2 to be used as a more general screen for language impairment, rather than focusing predominantly on pragmatic difficulties. Thus a semantic scale was reinstated in the CCC-2, and the syntax scale enhanced with additional items.

Composite scores

In the CCC, the only composite score that was used was a Pragmatic Composite formed by summing five scales (equivalent to scales D, E, F, G, and H). The study by Bishop (1998) showed that this composite distinguished fairly well between children with school diagnoses of semantic-pragmatic disorder and more typical SLI. However, as is discussed further in chapter 4, for the CCC-2, an analogous pragmatic composite showed disappointing levels of validity and inter-rater reliability. Although it was very effective in discriminating children with clinical diagnoses from controls, it was not so useful in distinguishing subtypes of communicative disorder, especially when parental ratings were used.

In CCC-2, two new composite scores are used. The first, the General Communication Composite, is based on all the communication scales (A to H). This is highly effective at discriminating children with a clinical diagnosis from typically developing children. The second index, the Social Interaction Deviance Composite, was derived to give optimal discrimination between children with typical SLI and those with evidence of disproportionate pragmatic difficulties.

4

Technical information

Technical information

Standardisation sample – UK

Norms for the CCC-2 were gathered in the course of standardising two other language assessments, the Test for Reception of Grammar - Second Edition (TROG-2) and the Expression, Reception and Recall of Narrative Instrument (ERRNI). Children aged from 4 to 16 years of age were recruited by student testers who were given a quota of cases meeting criteria of age, socioeconomic status and geographical region. Exclusionary criteria were: (a) sensorineural hearing loss (b) child has statement of special educational needs and (c) non-English-speaking home background.

Parents of children participating in the standardisation exercise were invited to complete a copy of the CCC-2. Parents of 542 children out of a possible of 875 completed a CCC-2, giving a response rate of 62%.

Representativeness of the sample

Table 4.1 provides information on the distribution of the sample in terms of age and sex. The larger sample sizes at the younger ages reflects the sampling strategy used in standardisation, which was designed to track more rapid developmental change at younger ages on some of the tests.

Table 4.1. Distribution of standardisation sample by age.

Age range	male	female	total
4.0 to 4.11	52	53	105
5.0 to 5.11	47	49	96
6.0 to 6.11	32	35	67
7.0 to 7.11	30	19	49
8.0 to 8.11	33	30	63
9.0 to 9.11	21	30	51
10.0 to 11.11	25	38	63
12.0 to 13.11	12	17	29
14.0 to 16.11	10	9	19
total	**262**	**280**	**542**

Socio-economic classification of the sample was carried out using geodemographic groups based on postcodes from the 2001 Census (Bureau van Dijk/CAMEO/electronic publishing). This coding specifies the predominant type of householder in a given postcode region. Table 4.2 shows the distribution.

Table 4.2. Socio-economic classification by postcode.

Geodemographic group	% this sample	% UK census
1. Young and affluent singles	8.5	4.7
2. Wealthy retired neighbourhoods	13.1	14.4
3. Affluent home owners	15.7	17.3
4. Smaller private family homes	15.7	15.7
5. Poorer home owners	21.4	16.8
6. Less affluent older neighbourhoods	6.9	6.3
7. Council tenants on family estates	7.8	10.7
8. Poorer council tenants, many single parents	6.5	9.4
9. Poorer singles	4.4	4.8

There is a statistically significant difference from the general population distribution (based on over 22 million households), $\chi^2(8) = 28.2$, $p < .001$, but in absolute terms this is slight (no more than 5 percentage points in any group), and there is ample representation of poorer as well as more affluent neighbourhoods in the sample.

Parents were asked to state the age at which they left full time (ft) education, and these values were averaged for mothers and fathers in two-parent families. Table 4.3 shows the educational characteristics of parents in the sample, contrasting 521 families who provided CCC information with the 297 who did not. (Information on parental education was not available from 27 families based at one school, as the head teacher did not approve of this information being sought, and in a few other cases parents failed to provide this information.)

Table 4.3. Parental educational level (average for mother and father) for parents of children who did and did not complete the CCC-2.

	completed CCC-2		did not complete CCC-2	
mean age leaving ft education	N	% of sample	N	% of sample
23 yr + (postgraduate)	25	4.8	9	3.0
21-23 yr (graduate)	77	14.8	38	12.8
18-20 yr (A-level)	124	23.8	79	26.6
16 to 17 yr (GCSE)	281	53.9	160	53.9
under 16 yr (no qualifications)	14	2.7	11	3.7
no data	21		36	

We had anticipated that those completing the CCC-2 would tend to have a higher educational level than those who did not, but although there was a trend in this direction, it did not approach statistical significance, $\chi^2(4) = 3.19$, $p = .526$.

Table 4.4 shows the geographical distribution of the sample. Because some testers did not fulfil their quotas, there is a statistically significant difference between obtained and expected percentages in each region ($\chi^2(9) = 54.9$, $p < .001$). Nevertheless, all regions are included, and discrepancies from the general population distribution are not striking. There is some over-representation of cases from the West Midlands and Yorkshire, and under-representation from East Anglia.

Table 4.4. Geographical distribution of CCC-2 standardisation sample.

	% in population	N in this sample	% this sample
South West	7.8	35	6.46
South East	30	145	26.75
West Midlands	9.2	78	14.39
East Midlands	6.8	41	7.56
East Anglia	3.3	3	0.55
North/North West	14.3	79	14.58
Yorkshire	8.7	76	14.02
Scotland	9.2	43	7.93
Wales	5	18	3.32
Northern Ireland	5.6	24	4.43

Derivation of norms

Data were first inspected for response consistency. In a handful of cases, the respondent had used the response options 0 or 1 for virtually all items, both positive and negative, suggesting they had failed to understand the meaning of the rating. A rule was derived to identify these cases so they could be excluded. CCC-2 ratings were deemed invalid if the mean score on positive items (after inverting scores, so that 3 represented impairment and 0 represented competence) was greater than 1.5, and the difference in mean score between positive and negative items was greater than 1.3. This rule is embodied in the 'consistency check' described in the section on scoring (see Chapter 3 and Appendix 3B). Nine checklists were excluded from the norms on this basis.

Other cases were excluded because some items had been omitted by the respondent. In general, missing data were much less of a problem with CCC-2 than with the original CCC: complete data were provided by 88% of respondents, one item was missed by a further 8%, and two items by 2% of respondents. Eight checklists were excluded from standardisation computations because more than 4 items had been left unchecked.

For each scale, a total score was computed by first inverting the positive items ($0 \rightarrow 3$, $1 \rightarrow 2$, $2 \rightarrow 1$, and $3 \rightarrow 0$), then adding all the ratings for that scale, so that a high score denoted greater impairment. Data from both sexes were treated together, as there was no significant main effect of sex on any of the scales when data were analysed in Manova. The means, standard deviations and distributions of raw scores were then scrutinised for each age group. The means showed a decrease with age, and, in some cases, the standard deviations also declined (see Table 4.5).

Table 4.5. Mean (SD) raw scores by age for CCC-2 scales.

	Scale									
Age band (yr)	A	B	C	D	E	F	G	H	I	J
4	3.16	2.09	4.11	3.40	7.26	2.68	5.04	2.20	1.64	5.69
N = 107	(3.8)	(3.20)	(2.53)	(2.95)	(3.83)	(2.27)	(3.28)	(2.57)	(1.86)	(3.02)
5	2.12	1.74	3.78	3.18	6.60	2.68	4.57	2.26	1.59	5.34
N = 91	(2.65)	(2.55)	(2.59)	(3.25)	(4.14)	(2.48)	(3.04)	(2.30)	(1.86)	(3.17)
6	1.20	1.05	3.14	2.15	5.12	2.17	3.46	1.55	1.45	4.73
N = 66	(1.85)	(1.59)	(2.45)	(2.15)	(3.54)	(1.93)	(2.49)	(1.91)	(1.75)	(3.11)
7	1.12	0.74	2.28	2.00	4.50	1.78	2.66	2.26	1.50	4.60
N = 50	(1.78)	(0.92)	(2.01)	(1.98)	(2.92)	(1.66)	(1.83)	(2.13)	(1.69)	(2.88)
8	0.95	1.03	2.03	1.58	3.77	1.73	2.15	1.71	1.61	3.70
N = 66	(1.99)	(1.66)	(1.93)	(1.98)	(3.52)	(1.93)	(2.30)	(2.33)	(2.67)	(2.60)
9	0.57	0.73	1.80	1.82	2.96	1.45	1.76	1.49	0.98	2.57
N = 49	(1.12)	(1.29)	(2.68)	(2.95)	(3.71)	(2.23)	(2.32)	(2.35)	(1.85)	(2.84)
10-11	0.84	0.69	1.68	1.85	2.97	1.50	1.65	1.52	1.18	2.65
N = 62	(1.60)	(1.57)	(2.31)	(2.90)	(3.40)	(2.30)	(2.50)	(2.49)	(1.85)	(2.55)
12-13	0.45	0.62	1.28	1.03	1.97	0.79	0.86	1.10	0.90	2.00
N = 29	(1.02)	(1.27)	(2.22)	(2.28)	(2.86)	(1.54)	(1.48)	(1.80)	(1.54)	(2.71)
14-16	0.26	0.37	0.58	0.63	1.11	0.58	0.16	0.32	0.37	1.05
N = 19	(0.65)	(1.16)	(1.12)	(1.21)	(1.88)	(1.17)	(0.37)	(0.67)	(0.96)	(1.47)

As can be seen from Table 4.5, floor effects were observed for all scales, especially at the older ages. It was decided to model the data using linear regression, while monitoring the impact of non-normality on the derived scores. In earlier work with the CCC, there has been little evidence of any age effects on scores in the pragmatic domain for clinical populations. However, in the large normative sample, covering the range from 4 to 16 years, there were significant correlations between raw scores and age for all of the scales, as shown in Table 4.6.

Table 4.6. Pearson correlations between age and CCC scales (N = 560). The first value is the raw correlation, and the second is the correlation with both age and raw score log-transformed. All correlations are statistically significant at the .01 level.

	raw	log
A	-.313	-.388
B	-.231	-.266
C	-.399	-.477
D	-.270	-.348
E	-.456	-.504
F	-.281	-.316
G	-.486	-.554
H	-.176	-.204
I	-.140	-.175
J	-.421	-.436

For each scale, the regression equation was computed for predicting total score from age in months, with both independent and dependent variable log-transformed. (The log transformation helped to reduce the differences in variance between age bands, and also enhanced the correlation with age.)

The obtained value was subtracted from the predicted value, and divided by the standard error of measurement to give a standardised residual score, which was scaled with mean of 10 and SD of 3, with a floor at zero. In effect, these scores correspond to age scaled scores. However, they are derived by modelling the relationship between age and raw score for the entire distribution, rather than by basing scaled scores on the mean and SD for each individual age band.

The impact of non-normality of the raw scores can be seen in Appendix 3C. There are two effects. First, the scaled scores have a ceiling, meaning that the CCC-2 is not well suited for assessing variation among children who have above average pragmatic skills. Second, the proportion of children scoring 2 SD below the mean is higher than would be expected for normally distributed data.

Standardisation sample – Australia

Parents of 147 Australian school children were given the CCC-2 to assess applicability of the norms in a different cultural setting. These children attended mainstream schools in the Perth metropolitan region, with approximately equal numbers aged 6 years, 9 years and 12 years. Completed CCC-2s were returned by 115 parents (78%), of which 111 passed the consistency check. The mean scaled scores on CCC-2 scales for this sample are shown in table 4.7.

Table 4.7. Mean (SD) scaled scores on CCC-2 for a sample of 111 Australian children aged 6, 9 and 12 years.

scale	mean	SD
A. speech	9.53	(3.09)
B. syntax	8.95	(3.34)
C. semantics	8.77	(3.10)
D. coherence	9.22	(3.14)
E. inappropriate initiation	9.32	(3.26)
F. stereotyped language	9.19	(3.22)
G. use of context	8.61	(3.18)
H. nonverbal communication	9.08	(2.99)
I. social relations	8.74	(3.12)
J. interests	8.63	(2.85)

In general, the scaled scores fell around one point below the expected mean of 10. On the GCC, 5% of children scored below 38 (3rd percentile for UK sample), 8% scored below 44 (5th percentile for UK sample), and 15% below 54 (10th percentile for UK sample). The mean GCC scores were very similar, and not significantly different, for the three age bands (6-year-olds, 71.6; 9-yr-olds, 75.6; 12-year-olds, 72.5; $F(2, 106) = 0.33$, $p = .721$). This suggests that different cutoffs should be used for Australian children: a score below 27 corresponds to the 3rd percentile, below 37 corresponds to the 5th percentile, and a score below 45 to the 10th percentile. On the SIDC, only three children in the Australian sample obtained a score less than −15, which is closely similar to the UK normative sample.

Reliability

Internal Consistency

The internal consistency (alpha) values for each scale are shown in Table 4.8.

Table 4.8. Internal consistency (alpha) for CCC scales.

	N	alpha
A. speech	537	.804
B. syntax	536	.729
C. semantics	527	.684
D. coherence	533	.781
E. inappropriate initiation	533	.803
F. stereotyped language	534	.658
G. use of context	527	.739
H. nonverbal communication	534	.694
I. social relations	531	.692
J. interests	530	.661

The values are at least .65 for all scales, indicating that ratings on the CCC-2 items cluster together coherently within each scale.

Inter-rater agreement

Normative data on CCC-2 were collected using parents as raters, on the grounds that parents have the best opportunity to observe their child in a range of different contexts over a long period of time. However, in clinical settings, it can be useful to also have ratings from a professional who knows the child well. To assess inter-rater agreement, CCC-2 data were gathered from a parent and a professional for 55 children who formed part of the clinical sample A in our validation study (see below). Pearson correlations between scaled scores obtained by teachers and parents are shown in Table 4.9.

Table 4.9. Pearson correlations between ratings by parents and professionals (teachers or speech and language therapists) for 55 children in a clinical sample.

	r
A. speech	.529
B. syntax	.516
C. semantics	.440
D. coherence	.292
E. inappropriate initiation	.340
F. stereotyped language	.157
G. use of context	.314
H. nonverbal communication	.412
I. social relations	.378
J. interests	.460
General Communication Composite	.396
Social Interaction Deviance Composite	.790

It is noteworthy that the correlations for the scales assessing pragmatic aspects of communication (E to G) tend to be lower than those for structural aspects. Indeed, for scales F and G the correlation does not reach conventional levels of statistical significance. To some extent this is to be expected, as pragmatic function is by definition, context-dependent, and teachers and parents will observe children in different contexts. Relatively low inter-rater agreement between parents and teachers for individual pragmatic scales was also found by Bishop and Baird with the original CCC. This is a characteristic finding in the field of child psychiatry, where the usual conclusion is that one needs to combine information from several informants, to get a realistic picture of the child's functioning (Achenbach, McConaughy, & Howell, 1987). One might wonder whether this disagreement between raters means checklist ratings are simply too unreliable to be useful, but, despite low inter-rater agreement, Bishop and Baird (2001) found that CCC scale scores did relate coherently to the child's diagnostic group. A similar pattern is observed with the CCC-2 (see below, 'validation').

The disagreement between parent and professional ratings generally took the form of professionals rating a lower level of impairment. In the whole sample of 55 children, only one scored above the 10th percentile in both parent and professional ratings. Two children were rated as unimpaired (above 10th percentile) by parents but impaired by professionals, whereas 13 children were rated as impaired by parents, but not by professionals. It seems likely that parents are more sensitive to communication difficulties than professionals because they have more opportunity to observe their child over an extended period and in a wide range of communicative settings.

The relatively high correlation between parents and professionals on the Social Interaction Deviance Composite was unexpected, given the relatively low inter-rater reliability of the scales on which it is based. This suggests that, although parents and professionals may be sensitive to different aspects of a child's communicative profile, they do concur in distinguishing between children with communicative features suggestive of autistic spectrum disorder and those with more specific language impairments.

Validity

Clinical samples

Validation data on the CCC-2 were gathered from three clinical samples. Sample A consisted of 74 children with a range of communicative problems who were participating in a research project conducted by Courtenay Norbury. Sample B was a group of 26 children who were on the caseloads of speech and language therapists in the Lothian Region of Scotland. Sample C was a series of 34 referrals to a tertiary developmental paediatric clinic.

Sample A

These children were recruited from language units and special schools in the South East of England. Some of these children had diagnoses of autistic

disorder or Asperger syndrome, whereas others had communicative difficulties but no diagnosis of autism. All had nonverbal IQs of 80 or above, and they were aged 7 to 16 years. Those who did not have diagnoses of high-functioning autism (HFA) or Asperger syndrome (Asp) were subdivided into three groups on the basis of information in the school files, using a similar procedure to that adopted by Bishop (1998), to give three subgroups: (a) typical SLI (SLI), (b) pragmatic language impairment without autistic features (PLI), and (c) pragmatic language impairment with autistic features (PLI+). A comparison group of 20 typically-developing children of similar age and nonverbal ability was recruited from mainstream schools. Two CCC-2s (one from PLI, and one from HFA) were discarded because they did not pass the consistency check (see Chapter 2, Scoring by Hand, point 9).

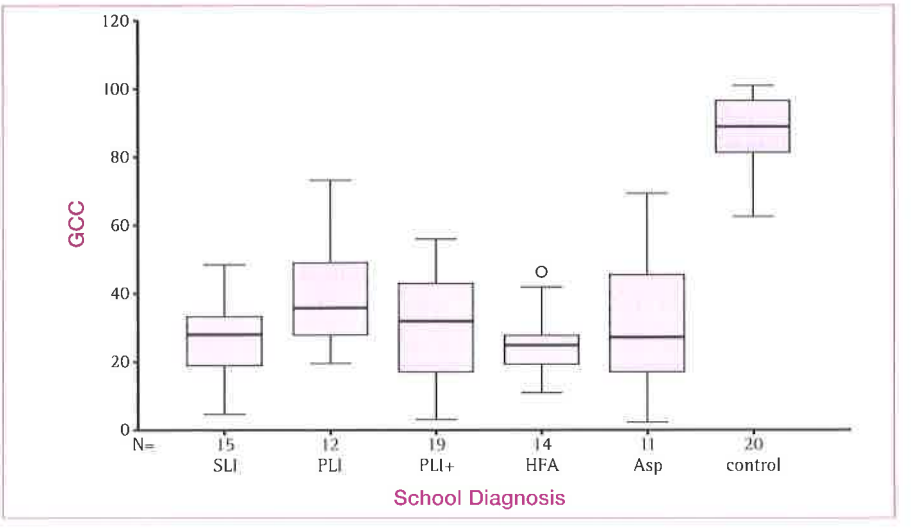
Table 4.10 shows that there are striking differences between the clinical groups and control group on all 10 subscales. For each subscale, an Anova gave a substantial group effect ($p < .001$), and Scheffé tests revealed significant differences (.05) between the control group and all five clinical groups.

Table 4.10. Mean CCC-2 scaled scores in relation to the diagnostic group, sample A.

		SLI	PLI	PLI+	HFA	Asp	control
	N	16	13	18	14	11	20
A. speech	Mean	2.44	5.23	5.72	5.21	5.82	10.75
	SD	2.61	3.56	3.34	4.00	3.06	2.40
B. syntax	Mean	2.75	4.92	4.78	3.79	6.27	11.20
	SD	3.19	3.59	3.92	3.24	3.82	1.24
C. semantics	Mean	2.31	4.62	2.61	2.79	4.64	11.50
	SD	2.18	3.2	2.35	2.12	3.53	2.84
D. coherence	Mean	2.56	4.62	3.28	2.21	3.27	11.65
	SD	1.50	2.50	2.61	2.19	3.00	2.35
E. inappropriate initiation	Mean	5.38	6.23	3.83	3.57	3.27	9.85
	SD	2.06	2.80	1.42	2.14	2.33	3.03
F. stereotyped language	Mean	3.69	6.38	4.61	2.36	3.36	10.90
	SD	1.35	2.87	3.22	2.31	3.29	2.63
G. use of context	Mean	2.06	3.38	1.22	0.64	1.09	10.85
	SD	1.73	2.26	1.59	1.01	1.76	2.39
H. nonverbal comm.	Mean	5.00	4.92	4.11	2.57	2.18	11.70
	SD	2.07	2.84	2.93	1.45	2.99	2.18
I. social relations	Mean	5.31	5.92	3.06	1.14	1.73	11.20
	SD	3.79	3.35	2.86	1.51	2.65	2.04
J. interests	Mean	5.69	5.77	3.67	3.36	2.36	10.50
	SD	1.78	2.39	1.61	1.45	1.29	3.32

Figure 4.1 shows the distributions of scores on the General Communication Composite (GCC), formed by summing scales A to H, in relation to diagnostic group. The box shows the middle 50% of cases, with the bold line indicating the median. The fins show the 10th and 90% percentiles, with outliers shown outside these limits.

Figure 4.1. Boxplots showing distribution of GCC in relation to diagnostic group, sample A.



It is clear that there is very little overlap between the scores of the clinical cases and those of the control group. Table 4.11 shows the numbers of children in each group whose scores fell below different percentile cutoffs. This shows that the GCC is especially sensitive to SLI and high-functioning autism: over 85% of children in those two groups obtain a GCC at or below the 3rd percentile. The groups least likely to have a low GCC are the PLI and Asperger group, 23.1% and 9.1% of whom respectively scored above the 10th percentile. These estimates must be treated cautiously, given the small sample sizes. These percentages are nevertheless low, compared with an expected rate in a typically developing sample of 90%.

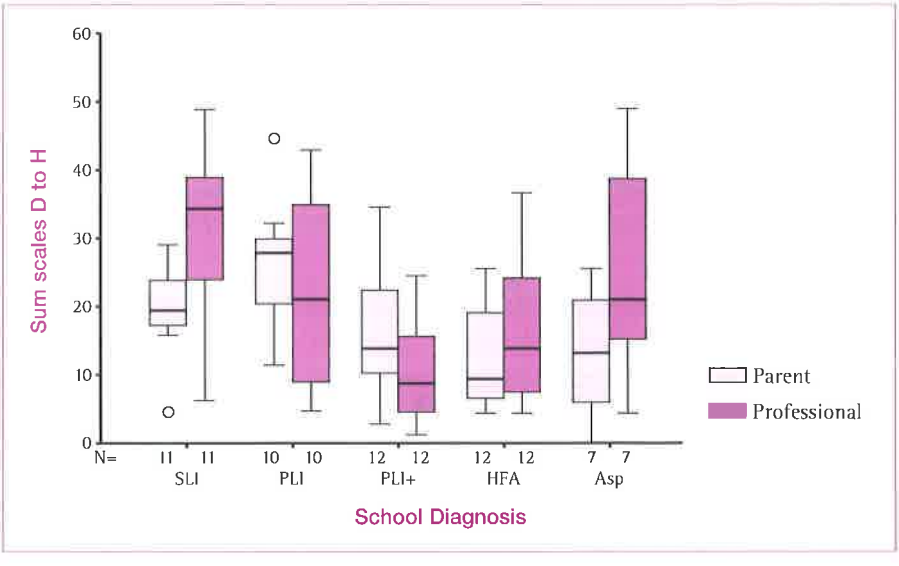
Table 4.11. Numbers (%) of children in each group with scores in a given range on GCC.

	School diagnosis					
GCC score	SLI	PLI	PLI+	HFA	Asp	control
37 or less	15	6	12	12	7	-
(3rd percentile or less)	(93.8%)	(46.2%)	(66.7%)	(85.7%)	(63.6%)	(0%)
38 to 44	-	1	2	1	-	-
(4th to 5th percentile)	(0%)	(7.7%)	(11.1%)	(7.1%)	(0%)	(0%)
45 to 54	1	3	3	1	3	-
(6th to 10th percentile)	(6.3%)	(23.1%)	(16.7%)	(7.1%)	(27.3%)	(0%)
55 or above	-	3	1	-	1	20
(above 10th percentile)	(0%)	(23.1%)	(5.6%)	(0%)	(9.1%)	(100%)
total N	**16**	**13**	**18**	**14**	**11**	**20**

Although it was encouraging to find the CCC-2 was sensitive to clinical communication disorders, the data in Table 4.10 suggested it might be less

good at discriminating between subtypes of communication impairment. An unexpected finding was the relatively poor scores on pragmatic scales obtained by children in the SLI group. Various explanations for these low scores were considered. For some scales that had featured in the pragmatic composite of the original CCC, namely coherence (D) and use of context (F) it is plausible that structural language difficulties could lead to low scores. For instance, if a child has difficulty formulating sentences, then it will be difficult to give a coherent account of a past event. However, it is not so easy to account for low scores for the SLI group on scales G (stereotyped language) and H (nonverbal communication) in this way. Another possibility was that parents and professionals have different perceptions of children's pragmatic difficulties. Some support for this view was obtained. Figure 4.2 shows boxplots indicating the distributions of scores on a pragmatic composite formed by summing scaled scores on scales D to H for those children for whom both teacher and parent CCC-2 had been obtained. (This is analogous to the pragmatic composite in the original CCC).

Figure 4.2. Boxplots showing distribution of scores on a pragmatic composite formed by summing scaled scores from scales D to H, in relation to diagnostic group and informant, sample A.

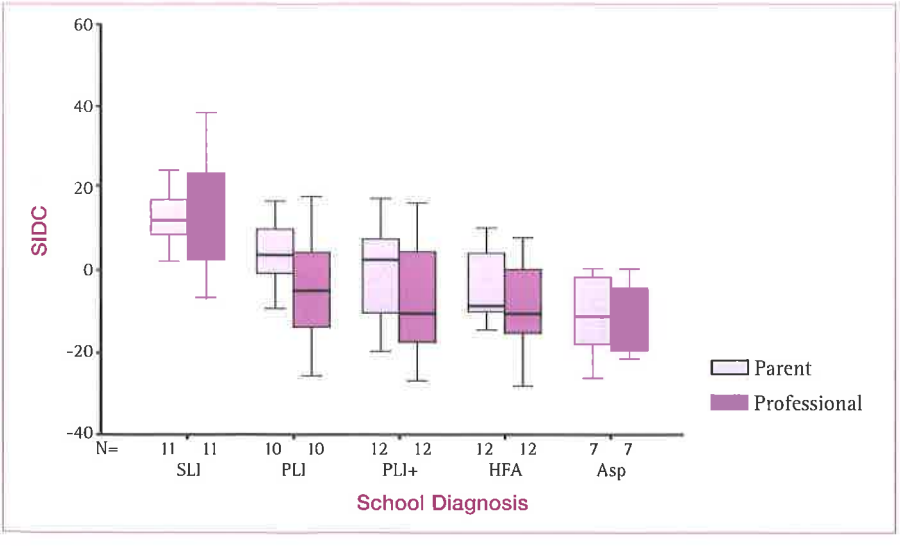


The expected mean for typically-developing children on this composite would be 50 (since it is formed by summing five scales with expected mean of 10). The parent ratings for the SLI group tend to be substantially lower on this composite than those for teachers. Furthermore, the inter-rater agreement between parents and professionals for this composite was low at .237. It was clear from these analyses that a pragmatic composite similar to that used in the original CCC would

not be very satisfactory at discriminating subgroups of children with communication impairments, especially if one was relying solely on parental report.

Scrutiny of the scores of the SLI and other groups did, however, suggest an alternative approach to subgroup discrimination, based on the profile of scaled scores rather than on the absolute level of pragmatic impairment. What distinguished the SLI group from the other groups was that their ratings on scales A to D were poor relative to their ratings on scales E, H, I and J (see Table 4.10). Accordingly, a new composite, based on these scales, was devised. This was termed the Social Interaction Deviance Composite (SIDC). It seemed more appropriate to talk of 'Social Interaction' rather than Pragmatics because the composite included scales I and J, which are not solely concerned with communication. The term 'deviance' is taken from the field of child psychiatry where it has been used to describe an uneven profile of functioning. If a child is merely immature in language functioning, we might expect low scores in most of the domains covered by the CCC-2, with a fairly even profile. A negative score on the SIDC indicates that the child has disproportionate difficulties in the domains rated by scales E (inappropriate initiation), H (nonverbal communication), I (social relations) and J (interests) relative to skill with the aspects of language structure and content covered by scales A (speech), B (syntax), C (semantics) and D (coherence). Note too that scales F and G are not included in the SIDC as children with a diagnosis of SLI often obtained low ratings from parents on these items. As noted above (see Reliability section) the inter-rater agreement between parents and professionals for the SIDC was impressive (.79), and as can be seen from Figure 4.3, this index does a reasonable job in separating children with SLI from the remaining clinical groups in a coherent fashion.

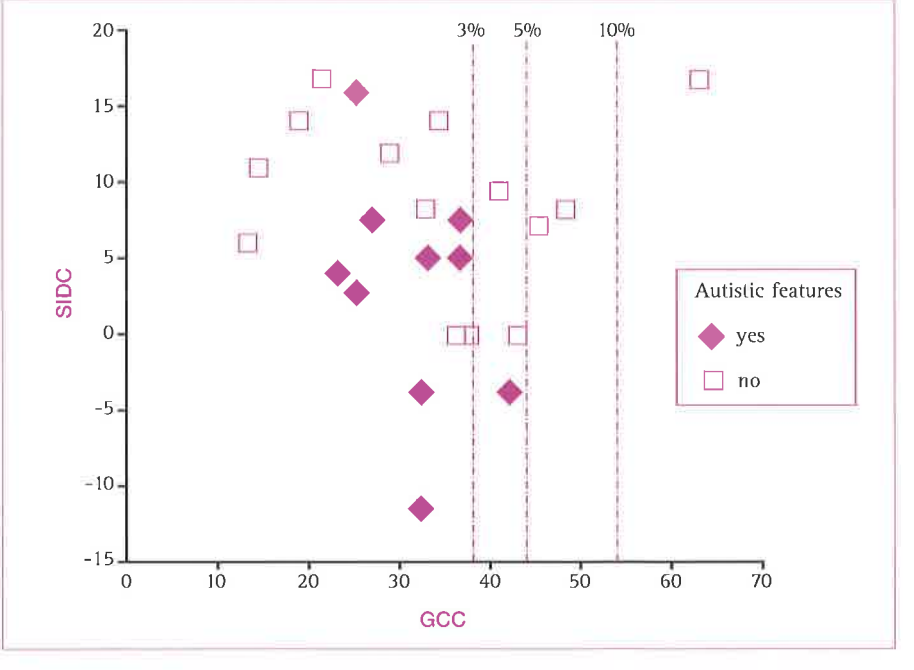
Figure 4.3. Boxplots showing distributions of Social Interaction Deviance Composite in relation to diagnostic group and informant, sample A.



Sample B

The language-impaired children in Sample A had all been in full-time special education. Sample B was recruited with the aim of sampling additional children, some of whom were in mainstream schools. After excluding two cases whose checklists did not pass the consistency check, parental CCC-2s were analysed for 14 children who were regarded as having a specific language impairment with no autistic features, eight of whom attended mainstream schools. In addition, CCC-2 data were gathered for a further 10 children with more complex communication problems. These had diagnoses of 'language impairment with autistic features' or 'autistic spectrum disorder', and all but one was attending full-time special education. None of these children had any organic etiology for language impairment. They were recruited via speech and language therapy services in Lothian, Scotland.

Figure 4.4. Scatterplot showing distribution of scores on GCC and SIDC in relation to diagnostic group for sample B.



The distributions of GCC and SIDC scores for these two subgroups are shown in figure 4.4. It can be seen that, as with sample A, the majority of children in this sample obtain scores below the 3rd percentile on the GCC, with only one child scoring above the 10th percentile. Furthermore, although there is more overlap between subgroups than in sample A, there is a significant difference between those with and without autistic features on the SIDC; $t\ (22) = 2.20$, $p < .038$.

Sample C

Sample C consisted of 34 referrals to a neurodevelopmental clinic specialising in the diagnosis of pervasive developmental disorders. (This was the same clinic from which children were drawn for the study by Bishop and Baird, 2001). Children's ICD-10 diagnoses were used to group children into five main diagnostic groups: Specific Language Impairment or Specific Learning Disability (SLI-SLD), Pervasive Developmental Disorder Not Otherwise Specified (PDDNOS), Autistic Disorder (Aut), Asperger's syndrome (Asp) and Attention Deficit Hyperactivity Disorder (ADHD). Many children had multiple diagnoses, and so the same procedure was adopted as in the study by Bishop and Baird (2001), namely that a diagnosis of autism or PDDNOS, if present, was treated as the main diagnosis. Data for two children were excluded because the CCC-2 failed the consistency check.

Figure 4.5. Scatterplot showing distributions of GCC and SIDC in relation to diagnostic group in sample C.

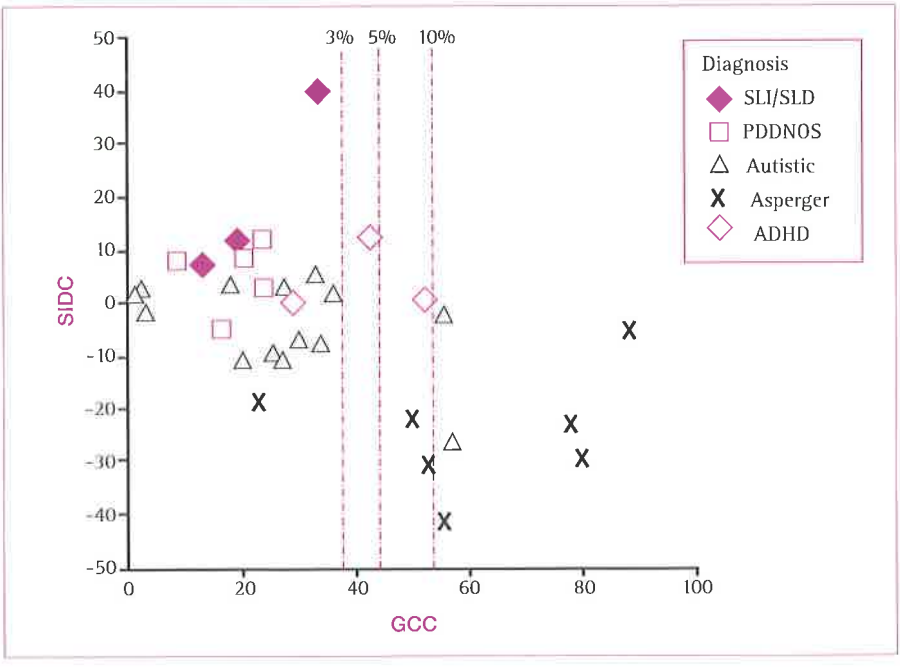


Figure 4.5 shows the distributions of scores on the GCC and SIDC from parental CCC-2s in relation to diagnostic group. The numbers in each diagnostic group are small, but the overall pattern is similar to that in sample A, with the majority of cases scoring below the 3rd percentile on the GCC, and the small subgroup of children with a diagnosis of SLI/SLD having a higher SIDC than the remainder. The exception is the Asperger syndrome group, who obtain relatively high scores on the GCC (with the median close to the 10th percentile relative to the norms). Nevertheless, the SIDC clearly identifies the uneven CCC-2 profile of this group

– note that a low SIDC will be seen if the child's structural language skills are disproportionately good in relation to pragmatic and social functioning. All but one child in the Asperger syndrome group obtained an SIDC of –15 or less, which is below the 3rd percentile in relation to the normative sample.

Samples A to C combined: CCC-2 scale profiles in different diagnostic groups

The mean scores on the 10 CCC-2 subscales are plotted in figures 4.6 to 4.10 for the different diagnostic groups, with children from samples A, B and C classified into broad groups of SLI/SLD, PLI, PDDNOS (including PLI+ cases from sample A), Autism and Asperger syndrome. These plots confirm that, in general, the CCC-2 yields profiles for subgroups that are consistent with clinical expectations, but there are also some surprises.

SLI/SLD group

As anticipated, this group has particular problems with scales A to D, with relatively better scores on the scales assessing pragmatic aspects of language. Nevertheless, their average scores on Scales E to J are well below the control mean of 10, with the average score on Scale G (use of context) particularly poor. To some extent, this is in line with other research, which has often revealed unexpected difficulties with pragmatic aspects of communication in children who are thought to have predominantly structural difficulties (see Bishop, 1997, for review, and also research using the earlier CCC by Bishop & Baird, 2001). As noted above, in the small sample for whom CCC-2 reports were available from professionals, it was found that their ratings of pragmatic aspects of communication tended to be higher than those of parents.

PLI group

These were all children from Sample A. They were placed in the PLI group because their school records documented that they had pragmatic difficulties, but with no evidence of autistic features. Although there has been some scepticism about the extent to which children can have pragmatic difficulties in the absence of autistic features, Bishop and Norbury (2002) were able to confirm that for some children this does seem to be the case, insofar as they do not have significant autistic symptomatology when assessed with standard diagnostic instruments for autistic disorder. We had anticipated that these children would do significantly worse than the SLI group on scales E to J, but a comparison of figures 4.6 and 4.7 indicates that this is not so. Instead, they have a rather even pattern of moderate impairment across the CCC-2 scales. On the pragmatic scales they perform at a similar level to the SLI group, and on scales A to D they perform better. This is an intriguing finding that suggests that the clinical impression of pragmatic deficit may be influenced by the child's structural language skills. If structural language skills are poor, then pragmatic difficulties are overlooked or discounted. However, if structural language skills are rather better, then the presence of pragmatic problems becomes much more noticeable.

Figure 4.6. *Mean scores on CCC-2 subscales for children with SLI/SLD, samples A, B and C combined.*

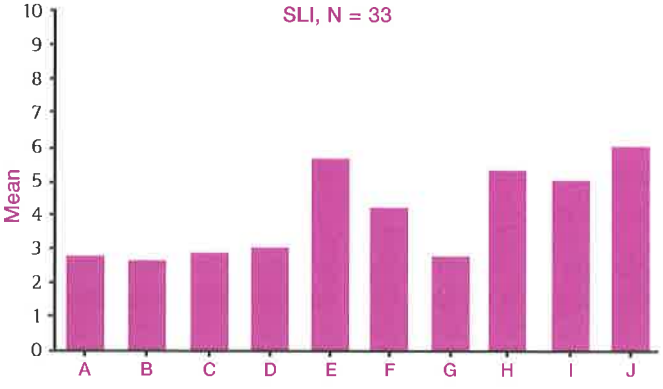


Figure 4.7. *Mean scores on CCC-2 subscales for children with PLI, samples A, B and C combined.*

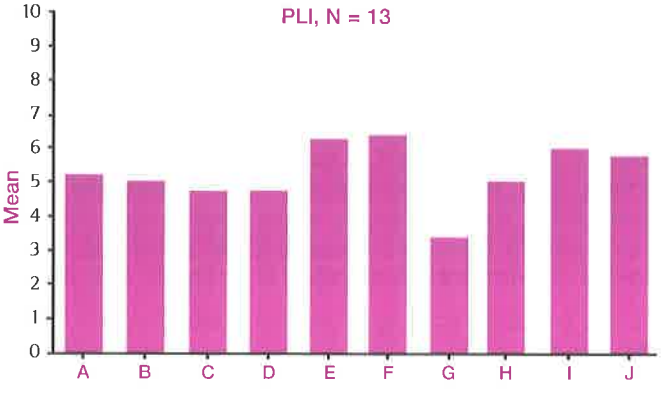
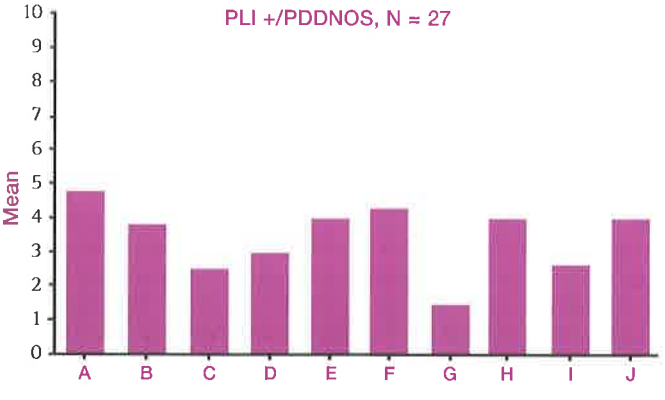


Figure 4.8. *Mean scores on CCC-2 subscales for children with PLI+/PDDNOS, samples A, B and C combined.*



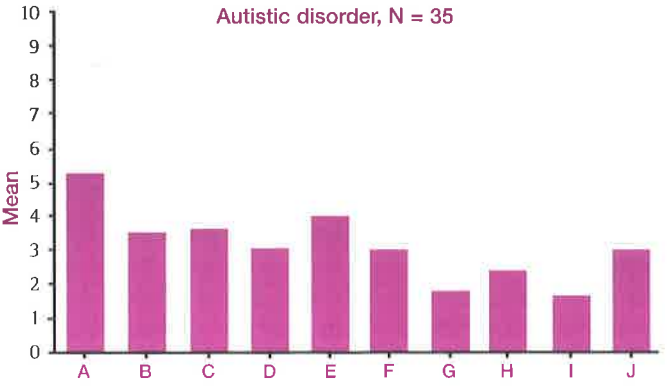


Figure 4.9. *Mean scores on CCC-2 subscales for children with autistic disorder, samples A, B and C combined.*

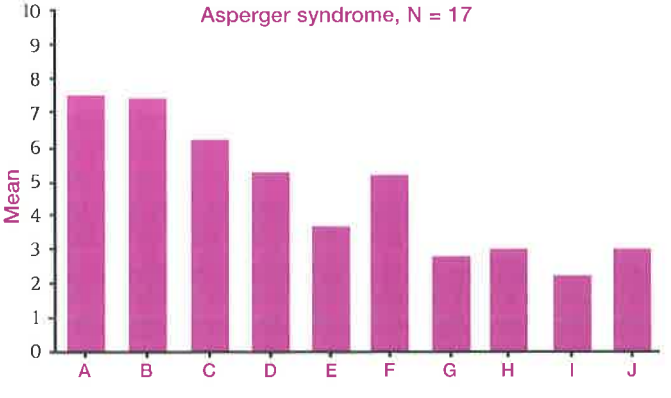


Figure 4.10. *Mean scores on CCC-2 subscales for children with Asperger syndrome, samples A, B and C combined.*

PLI+ or PDDNOS

In previous work, Bishop and Norbury (2002) used the term PLI+ to refer to non-autistic children with significant pragmatic difficulties plus autistic features. In conventional diagnostic frameworks such as DSM-IV (American Psychiatric Association, 1994), these children would most likely be categorised as cases of Pervasive Developmental Disorder Not Otherwise Specified (PDDNOS) – a diagnosis that is appropriate when the child has some features of autism, but falls short of meeting diagnostic criteria. Therefore the PLI+ cases from sample A were combined with PDDNOS cases from sample C. Overall, these children, like those with PLI, showed a relatively even pattern of impairment across scales A to D and E to J, but their overall level of score was lower than the PLI group, indicating more severe communication problems across the board.

Autistic disorder

It should be noted that, because the CCC-2 is only valid with children who are able to speak in sentences, this autistic sample is largely confined to relatively high-functioning children. Children with a diagnosis of autistic disorder had a profile that contrasted with that in SLI. Their mean scores on scales A to D were well below normal levels, but nevertheless tended to be better than the scores on scales F to I.

Asperger syndrome

The profile which was seen in autism was greatly magnified in the Asperger syndrome group, whose profile was like a mirror image of that seen in the SLI group, with striking impairments on the pragmatic scales E, F, G and H contrasting with relatively good scores on scales assessing language structure (A and B) and content (C and D).

Samples A to C combined: derivation of SIDC cutoffs

Although 'semantic-pragmatic disorder' or PLI is sometimes described as if it is a discrete category, recent research supports a more dimensional view, in which one may observe an entire spectrum of impairments, with typical SLI at one end and core autism at the other, with many children having patterns of impairment intermediate between these two extremes (e.g. Bishop & Norbury, 2002). Nevertheless, in research contexts it can sometimes be useful to divide children into discrete subgroups, and the SIDC can be used as a basis for such classification. Table 4.12 shows the distribution of SIDC scores for Samples A, B and C combined. There is only one child out of 51 with SIDC below zero who fell in the SLI/SLD category. At the other extreme, only one child out of 31 with SIDC above eight fell in the Autism category. Between these extremes is an area of diagnostic uncertainty. If one wanted to use the CCC-2 to select maximally contrasting subgroups from within a sample of children with communication impairments, then one could exclude those with SIDC scores between 0 and 8, and contrast the groups at the two extremes: those with scores below 0 would be designated as having an 'autistic spectrum' communication profile, whereas those above 8 would be designated as having an 'SLI' communication profile. However, this strategy would exclude a substantial number of children with intermediate profiles. The clinical data from CCC-2 are consistent with those using other diagnostic methods (Bishop & Norbury, 2002) in indicating that the most appropriate framework for categorisation of children's communication problems is dimensional rather than categorical. In many research contexts, it may be more fruitful to look for correlates of the SIDC score, rather than use it to categorise children into distinct groups.

Validation studies: overview

- The validation studies confirm the utility of the CCC-2 as a screening instrument. Children with clinically significant communication disorders are unlikely to obtain a GCC above the 10th percentile, and the majority score below the 3rd percentile.

- A 'pragmatic composite' that was formed by summing scaled scores on scales D to H was not useful in discriminating between subgroups of children with communication impairments. This was because all children with communication problems tended to obtain low scores on such a composite, even if they were regarded as having typical SLI without major pragmatic problems. Parents were more likely than professionals to identify pragmatic difficulties in a child with a diagnosis of SLI.
- A new composite, the Social Interaction Deviance Composite, identifies children with an uneven profile, in whom pragmatic aspects of communication are disproportionately impaired relative to other aspects of language. This composite has good inter-rater reliability and is sensitive to autistic spectrum disorders.

Table 4.12. Frequency of SIDC scores in relation to diagnostic group: samples A, B and C combined.

SIDC score	SLI/SLD	PLI	PLI+/PDDNOS	Autism	Asperger
-14 or lower			2	2	8
-13				1	1
-12				1	1
-11			2	2	
-10					1
-9		1	1	1	1
-8			1	4	
-7			1	2	2
-6			2	2	
-5		1			
-4			2	2	
-3	1			2	1
-2		1		1	
-1					1
0	3	1			
1		1		2	1
2	1	1	4	1	
3				3	
4	1	1	3	2	
5	2	1		2	
6	1	2	1	1	
7	1			2	
8	3		2	1	
9	1		2		
10	1	1			
11	3	1			
12	1		1	1	
13	4				
14	3				
15	1		1		
16		1	1		
17	2		1		
20 or more	4				
	33	**13**	**27**	**35**	**17**

References

Achenbach, T. M., McConaughy, S. H., & Howell, C. T. (1987). Child/adolescent behavioural and emotional problems: Implications of cross-informant correlations for situational specificity. *Psychological Bulletin,* 101, 213-232.

American Psychiatric Association. (1994). *Diagnostic and statistical manual of mental disorders, 4th edition.* Washington, D.C: American Psychiatric Association.

Bishop, D. V. M. (1998). Development of the Children's Communication Checklist (CCC): A method for assessing qualitative aspects of communicative impairment in children. *Journal of Child Psychology and Psychiatry,* 39, 879-891.

Bishop, D. V. M. (2000). What's so special about Asperger syndrome? The need for further exploration of the borderlands of autism. In A. Klin, F. R. Volkmar, & S. S. Sparrow (Eds.), *Asperger syndrome* (pp. 254-277). New York: Guilford Press.

Bishop, D. V. M. (1997). *Uncommon Understanding: Development and Disorders of Language Comprehension in Children.* Hove: Psychology Press.

Bishop, D. V. M., & Adams, C. (1991). What do referential communication tasks measure? A study of children with specific language impairment. *Applied Psycholinguistics,* 12, 199-215.

Bishop, D. V. M., & Baird, G. (2001). Parent and teacher report of pragmatic aspects of communication: use of the Children's Communication Checklist in a clinical setting. *Developmental Medicine and Child Neurology,* 43, 809-818.

Bishop, D. V. M., & Norbury, C. F. (2002). Exploring the borderlands of autistic disorder and specific language impairment: A study using standardised diagnostic instruments. *Journal of Child Psychology and Psychiatry,* 43, 917-929.

Bishop, D. V. M., & Rosenbloom, L. (1987). Classification of childhood language disorders. In W. Yule & M. Rutter (Eds.), *Language development and disorders. Clinics in Developmental Medicine (double issue)* (pp. 16-41). London: MacKeith Press.

Bureau van Dijk (2001 census). CAMEO, electronic publishing.

Conti-Ramsden, G., Crutchley, A., & Botting, N. (1997). The extent to which psychometric tests differentiate subgroups of children with SLI. *Journal of Speech, Language and Hearing Research,* 40, 765-777.

Lord, C., & Paul, R. (1997). Language and communication in autism. In D. J. Cohen & F. R. Volkmar (Eds.), *Handbook of autism and pervasive developmental disorders, 2nd edition* (pp. 195-225). New York: Wiley.

Rapin, I., & Allen, D. (1983). Developmental language disorders: nosologic considerations. In U. Kirk (Ed.), *Neuropsychology of language, reading, and spelling* (pp. 155-184). New York: Academic Press.

Rutter, M., Tizard, J., & Whitmore, K. (Eds.). (1970). *Education, health and behaviour.* London: Longman.

Additional reading

Diagnostic issues

Adams, C. (2001). Clinical diagnostic and intervention studies of children with semantic-pragmatic language disorder. *International Journal of Language and Communication Disorders*, 36, 289-305.

Bishop, D. V. M. (2000). Pragmatic language impairment: a correlate of SLI, a distinct subgroup, or part of the autistic continuum? In D. V. M. Bishop & L. B. Leonard (Eds.), *Speech and Language Impairments in Children: Causes, Characteristics, Intervention and Outcome* (pp. 99-113). Hove, UK: Psychology Press.

Leinonen, E., Letts, C., & Smith, B. R. (2000). *Children's pragmatic communication difficulties*. London: Whurr Publishers.

McTear, M., & Conti-Ramsden, G. (1992). *Pragmatic disability in children*. London: Whurr.

Rapin, I. (1996). Developmental language disorders: a clinical update. *Journal of Child Psychology and Psychiatry*, 37, 643-655.

Ripich, D., & Spinelli, F. (1985). *School discourse problems*. San Diego, CA: College Hill.

Intervention for pragmatic impairment

Anderson-Wood, L., & Smith, B. R. (2001). *Working with pragmatics: a practical guide to promoting communicative confidence*. Bicester, Oxon: Speechmark.

Attwood, T. (1997). *Asperger's syndrome: a guide for parents and professionals*. London: Jessica Kingsley.

Blank, M., Marquis, M., & Klimovitch, M. (1995). *Directing early discourse: Making the transition to school language*. San Antonio: Communication Skill Builders.

Brinton, B., & Fujiki, M. (1989). *Conversational management with language-impaired children: pragmatic assessment and intervention*. Rockville, MD.: Aspen Publishers.

Fey, M., Windsor, J., & Warren, S. (1995). *Language intervention: preschool through the elementary years*. Baltimore, MD: Paul Brookes.

Firth, C., & Venkatesh, K. (1999). *Semantic-pragmatic language disorder*. Bicester: Winslow Press.

Gray, C. (2000). *The New Social Story Book – Illustrated Edition*. Arlington, TX: Future Horizons.

Howlin., P. (1998). *Children with autism and Asperger syndrome: a guide for practitioners and carers*. Chichester: J. Wiley & Sons.

Howlin, P., Baron-Cohen, S., & Hadwin, J. (1999). *Teaching children with autism to mind-read: a practical guide for teachers and parents.* Chichester: J. Wiley & Sons.

Johnson, M. (1996). *Functional language in the classroom: an handbook for children with communication difficulties.* Manchester: Manchester Metropolitan University.

Naremore, R. C., Densmore, A. E., & Harman, D. R. (1995). *Language intervention with school age children: conversation, narrative and text.* San Diego: Singular Publishing.

Nash, P., Stengelhofen, J., Toombs, L., & Brown, J. (2002). *Improving children's communication: managing persistent difficulties.* London: Whurr.

Nowicki, S., & Duke, M. P. (1992). *Helping the child who doesn't fit in.* Atlanta: Peachtree Publishers.

Rinaldi, W. (2000). *Language difficulties in an educational context.* London: Whurr.

Rinaldi, W. (2001). *Social use of language programme (SULP) – Revised.* Windsor: NFER-Nelson.

Ripley, K., Barrett, J., & Fleming, P. (2001). *Inclusion for children with speech and language impairments: accessing the curriculum and promoting personal and social development.* London: David Fulton

Wetherby, A. M., & Prizant, B. M. (2000). *Autism spectrum disorders: a transactional developmental perspective.* Baltimore: Paul Brookes.

Appendices

Appendix 1: Example of a completed CCC-2 Checklist

N.B. The leftmost column on pages 2-4 of the checklist shows the scale to which each item belongs.

INSTRUCTIONS

The CCC-2 was developed to help us understand more about communication strengths and difficulties in children. Although we can get an idea of how a child communicates by using language tests, it is helpful to also find out how the child behaves in an everyday setting. You can help us do this by completing the items on the next three pages.

This checklist contains a series of statements describing how children communicate. For each statement, you are asked to give information about the child whose name (or code number) appears below. You are asked to judge whether you have observed that behaviour:

0. less than once a week (or never)
1. at least once a week, but not every day
2. once or twice a day
3. several times (more than twice) a day (or always)

Please write the number in the box for each item, choosing the response that, in your judgement, best describes the child. If you find it hard to make up your mind, think over the last week, and try to remember how often you have observed the child behaving this way.

Please read each item carefully. Do not leave any items blank. If you are really unable to make a judgement, please put an X against that item, and add a comment if you wish.

Name or code number of child: CN28 Gender: M

Date of birth: 1 March 1990 Today's date: 2 April 2003 Age: 13 yrs 1 month

Your name (person completing the checklist): Linda Smith

Your relation to the child (i.e. parent, speech therapist, etc.): Parent

(For respondents other than parents) How long have you known this child? _____

Has s/he ever had a permanent hearing loss diagnosed? YES ☐ NO ☑
If YES, please give further details below.

Has s/he any permanent physical handicap or chronic illness? YES ☐ NO ☑
If YES, please give further details below.

Is English the main language spoken at home? YES ☑ NO ☐
If NO, please give further details below.

Is s/he able to string words together in sentences? YES ☑ NO ☐
The CCC-2 is intended to be used with children who can talk in simple sentences, so if you have ticked NO, please do not complete any further questions

Additional details:

Children's Communication Checklist (CCC-2) by D.V.M. Bishop

Please enter a number in the ☐ box in the right hand column, as follows:
0 = less than once a week (or never); 1 = at least once a week, but not every day
2 = once or twice a day; 3 = several times (more than twice) a day (or always)

B	1	Gets mixed up between he and she so might say "he" when talking about a girl, or "she" when talking about a boy	1
A	2	Simplifies words by leaving out some sounds, e.g. "crocodile" pronounced as "cockodile", or "stranger" as "staynger"	2
I	3	Appears anxious in the company of other children	0
C	4	Makes false starts, and appears to grope for the right words; e.g., might say "can I – can I – can – can I have an – have an ice-cream"	2
E	5	Talks repetitively about things that no-one is interested in	0
C	6	Forgets words s/he knows – e.g. instead of "rhinoceros" may say "you know, the animal with the horn on its nose..."	1
I	7	With familiar adults, seems inattentive, distant or preoccupied	1
H	8	Looks blank in a situation where most children would show a clear facial expression – e.g. when angry, fearful or happy	1
J	9	When given the opportunity to do what s/he likes, chooses the same favourite activity (e.g. playing a specific computer game)	1
D	10	Uses terms like "he" or "it" without making it clear what s/he is talking about. For instance, when talking about a film, might say "he was really great" without explaining who "he" is	1
F	11	Says things that s/he does not seem to fully understand (may appear to be repeating something s/he's heard an adult say). So, for instance, a 5-year-old may be heard to say of a teacher "she's got a very good reputation"	1
C	12	Mixes up words of similar meaning. e.g., might say "dog" for "fox", or "screwdriver" for "hammer"	2
I	13	Is babied, teased, or bullied by other children	2
H	14	Does not look at the person s/he is talking to	2
G	15	Misses the point of jokes and puns (though may be amused by nonverbal humour such as slapstick)	1
I	16	Is left out of joint activities by other children	1
B	17	Gets mixed up between he/him or she/her, so might say "him is working" rather than "he is working", or "her have a cake" rather than "she has a cake"	2
F	18	Uses favourite phrases, sentences or longer sequences in rather inappropriate contexts. E.g., might say "all of a sudden" rather than "then", as in "we went to the park and all of a sudden we had a picnic". Or might habitually start utterances with "by the way"	2
G	19	Gets confused when a word is used with a different meaning from usual: e.g. might fail to understand if an unfriendly person was described as "cold" (and would assume they were shivering!)	1
H	20	Stands too close to other people when talking to them	1
E	21	Talks to people too readily: e.g. without any encouragement, starts up a conversation with a stranger	
J	22	Talks about lists of things s/he has memorised e.g., the names of the capitals of the world, or the names of varieties of dinosaurs	1
F	23	Pronounces words in an over-precise manner: accent may sound affected or "put-on", as if child is mimicking a TV personality rather than talking like those around him/her	0
A	24	Pronounces words in a babyish way, such as "chimbley" for "chimney" or "bokkle" for "bottle"	1
D	25	Can be hard to tell if s/he is talking about something real or make-believe	0
J	26	Moves the conversation to a favourite topic, even if others don't seem interested in it	1

Children's Communication Checklist (CCC-2) by D.V.M. Bishop

Please enter a number in the ☐ box in the right hand column, as follows:
0 = less than once a week (or never); 1 = at least once a week, but not every day
2 = once or twice a day; 3 = several times (more than twice) a day (or always)

B	27	Produces utterances that sound babyish because they are just 2 or 3 words long, such as "me got ball" instead of "I've got a ball" or "give dolly" instead of "give me the dolly"	0
G	28	Ability to communicate varies from situation to situation – e.g. may cope well when talking one-to-one with a familiar adult, but have difficulty expressing him/herself in a group of children	2
A	29	Leaves off beginnings or ends of words, e.g. says "roe" instead of "road" or "nana" instead of "banana"	1
F	30	Repeats back what others have just said. For instance, if you ask, "what did you eat?" might say, "what did I eat?"	2
H	31	Ignores conversational overtures from others (e.g. if asked, "what are you making?" does not look up and just continues working)	1
C	32	Mixes up words that sound similar. e.g. might say "telephone" for "television" or "magician" for "musician"	1
I	33	Hurts or upsets other children without meaning to	0
G	34	Takes in just 1-2 words in a sentence, and so misinterprets what has been said. E.g. if someone says "I want to go skating next week", s/he may think they've been skating, or want to go now	3
E	35	It's difficult to stop him/her from talking	0
B	36	Leaves off past tense – ed endings on words, so might say "John kick the ball" instead of "John kicked the ball", or "Sally play over there" instead of "Sally played over there"	1
E	37	Tells people things they know already	0
A	38	Makes mistakes in pronouncing long words; e.g. says "vegebable" rather than "vegetable" or "trellistope" rather than "telescope"	1
H	39	Fails to recognise when other people are upset or angry	0
D	40	Gets the sequence of events muddled up when trying to tell a story or describe a recent event. E.g. if describing a film, might talk about the end before the beginning	0
G	41	Is over-literal, sometimes with (unintentionally) humorous results. E.g., a child who was asked "Do you find it hard to get up in the morning" replied "No. You just put one leg out of the bed and then the other and stand up." Another child who was told "watch your hands" when using scissors, proceeded to stare at his fingers.	0
F	42	Includes over-precise information (e.g. exact date or time) in his/her talk, e.g. when asked "when did you go on holiday" may say "13th July 1995" rather than "in the summer"	1
B	43	Leaves out "is", and so says "Daddy going to work" rather than "Daddy's going to work" or "Daddy is going to work". Or might say "The boy big" rather than "The boy is big"	0
A	44	Mispronounces "th" for "s" or "w" for "r". E.g. says "thoap" instead of "soap" or "wabbit" instead of "rabbit"	1
E	45	Asks a question, even though s/he has been given the answer	1
C	46	Is vague in choice of words, making it unclear what s/he is talking about, e.g. saying "that thing" rather than "kettle"	1
J	47	Shows interest in things or activities that most people would find unusual, such as traffic lights, washing machines, lamp-posts	0
D	48	Doesn't explain what s/he is talking about to someone who doesn't share his/her experiences; for instance, might talk about "Johnny" without explaining who he is	1
J	49	Surprises people by his/her knowledge of unusual words – uses terms you'd expect to hear from an adult rather than child	0
D	50	It is hard to make sense of what s/he is saying (even though the words are clearly spoken)	1

Page 4

Children's Communication Checklist (CCC-2) by D.V.M. Bishop

Please enter a number in the ☐ box in the right hand column, as follows:
0 = less than once a week (or never); 1 = at least once a week, but not every day
2 = once or twice a day; 3 = several times (more than twice) a day (or always)

The questions so far have asked about difficulties children may have that affect communication. The remaining questions ask about communicative strengths.

Please respond 0 to 3, as before, but remember that now a 0 response would mean that a child lacks this strength, and a 3 would indicate good communicative skill.

A	51	Speaks clearly so that the words can easily be understood by someone who doesn't know him/her very well	1
J	52	Reacts positively when a new and unfamiliar activity is suggested	1
D	53	Talks clearly about what s/he plans to do in the future (e.g. what s/he will do tomorrow, or plans for going on holiday)	3
G	54	Appreciates the humour expressed by irony. Would be amused rather than confused if someone said "isn't it a lovely day!" when it is pouring with rain	2
B	55	Produces long and complicated sentences such as: "When we went to the park I had a go on the swings"; "I saw this man standing on the corner"	2
H	56	Makes good use of gestures to get his/her meaning across	2
I	57	Shows concern when other people are upset	3
A	58	Speaks fluently and clearly, producing all speech sounds accurately and without any hesitation	1
E	59	Keeps quiet in situations where someone else is trying to talk or concentrate (e.g. when someone else is watching TV, or during formal occasions such as school assembly or a religious ceremony)	2
G	60	Realises the need to be polite – would pretend to be pleased if given a present s/he did not really like, and would avoid making personal comments about strangers	2
F	61	When answering a question, provides enough information without being over-precise	2
F	62	You can have an enjoyable, interesting conversation with him/her	
J	63	Shows flexibility in adapting to unexpected situations: e.g. does not get upset if s/he planned to play on the computer, but has to do something else because it isn't working	1
C	64	Uses abstract words that refer to general concepts rather than something you can see – e.g. "knowledge", "politics", "courage"	2
H	65	Smiles appropriately when talking to people	3
C	66	Uses words that refer to whole classes of objects, rather than a specific item. E.g. refers to a table, chair and drawers as "furniture", or to apples, bananas and pears as "fruit"	2
I	67	Talks about his/her friends; shows interest in what they do and say	3
D	68	Explains a past event (e.g. what s/he did at school, or what happened at a football game) clearly	2
B	69	Produces sentences containing "because" such as "John had a cake because it was his birthday"	2
E	70	Talks to others about their interests, rather than his/her own	3

Appendix 2: Example of a completed CCC-2 Summary Sheet

Name / ID: CN28 Date of birth: 1st March 1990 Date of CCC-2: 2nd April 2003 Age: 13 yrs 1 month

scale	W: items 51-70	Pos: = [6]-W	X: items 1-26	Y: items 27-50	Neg = X+Y	M: items missing	Sum = Neg + Pos	Scaled score	Percentile
A. speech	2	6-2=4	3	3	6		10	0	<1
B. syntax	4	6-4=2	3	1	4		6	2	2
C. semantics	4	6-4=2	5	2	7		9	2	1
D. coherence	5	6-5=1	1	2	3		4	5	8
E. inappropriate initiation	5	6-5=1	0	1	1	1(x)	2x7/6=2	9	49
F. stereotyped language	2	6-2-3=1	3	3	6	1(w)	7x7/6=8	3	2
G. use of context	4	6-4=2	2	5	7		9	2	<1
H. nonverbal communication	5	6-5=1	4	1	5		6	4	5
I. social relations	6	6-6=0	4	0	4		4	5	9
J. interests	2	6-2=4	3	0	3		7	5	5
sum		positive sum 18			negative sum 46				

Validity check: Are positive sum and negative sum consistent?
(See Appendix 3B) YES ☑ NO ☐

* See manual for instructions if you have missing values on the 'positive' items for any scale

GCC sum (A-H) 27	<1
SIDC sum (E, H, I, J) – sum (A-D) 14	

PEARSON

CCC-2

Printed in the United Kingdom ISBN 978 0 7491176 02 5

Appendix 3: Table of norms 3A: Conversion of raw score to scaled scores

Age 4.0 – 4.2 — 4 years, 0 months, 0 days – 4 years, 2 months, 30 days

	Scale									
Raw Score	A	B	C	D	E	F	G	H	I	J
0	15	14	19	16	20	16	19	14	14	19
1	12	11	15	13	17	13	16	12	11	16
2	11	9	13	11	15	11	14	10	9	14
3	9	8	12	10	14	10	13	9	8	13
4	8	7	11	9	13	9	12	8	7	12
5	7	6	10	9	12	8	11	7	6	11
6	7	5	9	8	12	7	10	6	5	11
7	6	5	9	7	11	7	10	6	5	10
8	6	4	8	7	11	6	9	5	4	10
9	5	3	8	7	10	6	9	5	4	9
10	5	3	7	6	10	5	8	4	3	9
11	4	3	7	6	9	5	8	4	3	8
12	4	2	6	5	9	5	8	4	2	8
13	4	2	6	5	9	4	7	3	2	8
14	3	2	6	5	9	4	7	3	2	7
15	3	1	5	5	8	4	7	3	1	7
16	3	1	5	4	8	3	6	3	1	7
17	3	0	5	4	8	3	6	2	0	6
18	2	0	5	4	8	3	6	2	0	6
19	2	0	4	4	7	3	6	2	0	6
20	2	0	4	3	7	2	5	2	0	6
21	2	0	4	3	7	2	5	1	0	6

Age 4.3 – 4.5 — 4 years, 3 months, 0 days – 4 years, 5 months, 30 days

	Scale									
Raw score	A	B	C	D	E	F	G	H	I	J
0	15	14	18	16	19	15	19	14	14	19
1	12	11	15	13	16	12	16	11	11	16
2	10	9	13	11	15	11	14	10	9	14
3	9	7	11	10	13	9	12	8	7	13
4	8	6	10	9	12	8	11	8	6	12
5	7	6	9	8	12	8	10	7	6	11
6	6	5	9	8	11	7	10	6	5	10
7	6	4	8	7	11	6	9	6	4	10
8	5	4	8	7	10	6	9	5	4	9
9	5	3	7	6	10	5	8	5	3	9
10	4	3	7	6	9	5	8	4	3	8
11	4	2	6	5	9	5	7	4	3	8
12	4	2	6	5	9	4	7	3	2	7
13	3	2	5	5	8	4	7	3	2	7
14	3	1	5	4	8	4	6	3	1	7
15	3	1	5	4	8	3	6	3	1	6
16	2	0	5	4	7	3	6	2	0	6
17	2	0	4	4	7	3	5	2	0	6
18	2	0	4	4	7	3	5	2	0	6
19	2	0	4	3	7	2	5	2	0	5
20	1	0	4	3	7	2	5	1	0	5
21	1	0	3	3	6	2	4	1	0	5

Table of norms 3A: Conversion of raw score to scaled scores

Age 4.6 – 4.8 4 years, 6 months, 0 days – 4 years, 8 months, 30 days

	Scale									
Raw score	A	B	C	D	E	F	G	H	I	J
0	15	14	18	15	19	15	18	14	14	18
1	11	10	14	12	16	12	15	11	10	15
2	10	9	12	11	14	10	13	9	9	14
3	8	7	11	10	13	9	12	8	7	12
4	7	6	10	9	12	8	11	7	6	11
5	7	5	9	8	11	7	10	7	5	10
6	6	5	8	7	11	7	9	6	5	10
7	5	4	8	7	10	6	9	5	4	9
8	5	3	7	6	10	6	8	5	4	9
9	4	3	7	6	9	5	8	4	3	8
10	4	3	6	5	9	5	7	4	3	8
11	4	2	6	5	8	4	7	4	2	7
12	3	2	5	5	8	4	6	3	2	7
13	3	1	5	4	8	4	6	3	2	7
14	3	1	5	4	7	3	6	3	1	6
15	2	0	4	4	7	3	5	2	1	6
16	2	0	4	4	7	3	5	2	0	6
17	2	0	4	3	7	3	5	2	0	6
18	2	0	4	3	6	2	5	2	0	5
19	1	0	3	3	6	2	4	1	0	5
20	1	0	3	3	6	2	4	1	0	5
21	0	0	3	3	6	2	4	1	0	5

Age 4.9 – 4.11 4 years, 9 months, 0 days – 4 years, 11 months, 30 days

	Scale									
Raw score	A	B	C	D	E	F	G	H	I	J
0	14	13	17	15	18	15	18	14	13	18
1	11	10	14	12	15	12	14	11	10	15
2	9	8	12	11	14	10	13	9	9	13
3	8	7	11	9	13	9	11	8	7	12
4	7	6	9	8	12	8	10	7	6	11
5	6	5	9	8	11	7	9	6	5	10
6	6	4	8	7	10	6	9	6	5	9
7	5	4	7	6	10	6	8	5	4	9
8	5	3	7	6	9	5	8	5	4	8
9	4	3	6	6	9	5	7	4	3	8
10	4	2	6	5	8	4	7	4	3	7
11	3	2	5	5	8	4	6	3	2	7
12	3	2	5	4	8	4	6	3	2	7
13	3	1	5	4	7	3	6	3	2	6
14	2	0	4	4	7	3	5	3	1	6
15	2	0	4	4	7	3	5	2	0	6
16	2	0	4	3	6	3	5	2	0	5
17	1	0	3	3	6	2	4	2	0	5
18	1	0	3	3	6	2	4	2	0	5
19	1	0	3	3	6	2	4	1	0	5
20	0	0	3	3	6	2	4	1	0	5
21	0	0	2	2	5	1	3	0	0	4

Age 5.0 – 5.2 5 years, 0 months, 0 days – 5 years, 2 months, 30 days

Raw Score	Scale A	B	C	D	E	F	G	H	I	J
0	14	13	17	15	18	15	17	14	13	18
1	11	10	13	12	15	12	14	11	10	15
2	9	8	12	10	13	10	12	9	8	13
3	8	7	10	9	12	9	11	8	7	12
4	7	6	9	8	11	8	10	7	6	11
5	6	5	8	7	10	7	9	6	5	10
6	5	4	8	7	10	6	8	6	5	9
7	5	4	7	6	9	6	8	5	4	9
8	4	3	6	6	9	5	7	5	3	8
9	4	3	6	5	8	5	7	4	3	8
10	3	2	5	5	8	4	6	4	3	7
11	3	2	5	5	8	4	6	3	2	7
12	3	1	5	4	7	3	5	3	2	6
13	2	1	4	4	7	3	5	3	1	6
14	2	0	4	4	7	3	5	2	1	6
15	2	0	4	3	6	3	4	2	0	5
16	1	0	3	3	6	2	4	2	0	5
17	1	0	3	3	6	2	4	2	0	5
18	0	0	3	3	6	2	4	1	0	5
19	0	0	3	2	5	2	3	1	0	4
20	0	0	2	2	5	1	3	1	0	4
21	0	0	2	2	5	1	3	0	0	4

Age 5.3 – 5.5 5 years, 3 months, 0 days – 5 years, 5 months, 30 days

Raw Score	Scale A	B	C	D	E	F	G	H	I	J
0	14	13	16	15	18	15	17	14	13	18
1	11	10	13	12	15	11	14	11	10	14
2	9	8	11	10	13	10	12	9	8	13
3	8	7	10	9	12	8	11	8	7	11
4	7	6	9	8	11	7	9	7	6	10
5	6	5	8	7	10	7	9	6	5	10
6	5	4	7	7	9	6	8	6	4	9
7	5	3	7	6	9	5	7	5	4	8
8	4	3	6	6	8	5	7	4	3	8
9	4	2	6	5	8	4	6	4	3	7
10	3	2	5	5	8	4	6	4	2	7
11	3	2	5	4	7	4	5	3	2	6
12	2	1	4	4	7	3	5	3	2	6
13	2	0	4	4	7	3	5	3	1	6
14	2	0	4	3	6	3	4	2	1	5
15	2	0	3	3	6	2	4	2	0	5
16	1	0	3	3	6	2	4	2	0	5
17	1	0	3	3	6	2	4	2	0	5
18	0	0	3	2	5	2	3	1	0	4
19	0	0	2	2	5	1	3	1	0	4
20	0	0	2	2	5	1	3	0	0	4
21	0	0	2	2	5	1	3	0	0	4

Table of norms 3A: Conversion of raw score to scaled scores

Age 5.6 – 5.8 5 years, 6 months, 0 days – 5 years, 8 months, 30 days

	Scale									
Raw Score	A	B	C	D	E	F	G	H	I	J
0	14	13	16	14	17	14	17	14	13	17
1	10	10	13	12	14	11	13	11	10	14
2	9	8	11	10	13	10	12	9	8	12
3	7	7	10	9	12	8	10	8	7	11
4	6	6	9	8	11	7	9	7	6	10
5	6	5	8	7	10	7	8	6	5	9
6	5	4	7	6	9	6	8	5	4	9
7	4	3	6	6	9	5	7	5	4	8
8	4	3	6	5	8	5	6	4	3	7
9	3	2	5	5	8	4	6	4	3	7
10	3	2	5	5	7	4	6	4	2	7
11	3	1	4	4	7	4	5	3	2	6
12	2	1	4	4	7	3	5	3	2	6
13	2	0	4	4	6	3	4	3	1	6
14	2	0	3	3	6	3	4	2	0	5
15	1	0	3	3	6	2	4	2	0	5
16	1	0	3	3	6	2	4	2	0	5
17	0	0	3	3	5	2	3	1	0	4
18	0	0	2	2	5	1	3	1	0	4
19	0	0	2	2	5	1	3	1	0	4
20	0	0	2	2	5	1	3	0	0	4
21	0	0	2	2	4	0	2	0	0	3

Age 5.9 – 5.11 5 years, 9 months, 0 days – 5 years, 11 months, 30 days

	Scale									
Raw Score	A	B	C	D	E	F	G	H	I	J
0	13	13	16	14	17	14	16	14	13	17
1	10	10	13	11	14	11	13	11	10	14
2	9	8	11	10	12	9	11	9	8	12
3	7	6	9	9	11	8	10	8	7	11
4	6	5	8	8	10	7	9	7	6	10
5	5	5	7	7	10	6	8	6	5	9
6	5	4	7	6	9	6	7	5	4	8
7	4	3	6	6	8	5	7	5	4	8
8	4	3	6	5	8	5	6	4	3	7
9	3	2	5	5	7	4	6	4	3	7
10	3	2	5	4	7	4	5	3	2	6
11	2	1	4	4	7	3	5	3	2	6
12	2	0	4	4	6	3	4	3	1	6
13	2	0	3	3	6	3	4	2	1	5
14	1	0	3	3	6	2	4	2	0	5
15	1	0	3	3	6	2	4	2	0	5
16	0	0	3	3	5	2	3	2	0	4
17	0	0	2	2	5	2	3	1	0	4
18	0	0	2	2	5	1	3	1	0	4
19	0	0	2	2	5	1	2	0	0	4
20	0	0	2	2	4	0	2	0	0	3
21	0	0	1	2	4	0	2	0	0	3

Age 6.0 – 6.2 — 6 years, 0 months, 0 days – 6 years, 2 months, 30 days

Raw Score	Scale A	B	C	D	E	F	G	H	I	J
0	13	13	16	14	17	14	16	13	13	17
1	10	10	12	11	14	11	13	11	10	14
2	8	8	11	10	12	9	11	9	8	12
3	7	6	9	8	11	8	10	8	7	11
4	6	5	8	7	10	7	9	7	6	10
5	5	4	7	7	9	6	8	6	5	9
6	5	4	7	6	9	6	7	5	4	8
7	4	3	6	6	8	5	6	5	4	8
8	3	3	5	5	8	4	6	4	3	7
9	3	2	5	5	7	4	5	4	3	7
10	3	2	4	4	7	4	5	3	2	6
11	2	1	4	4	6	3	5	3	2	6
12	2	0	4	4	6	3	4	3	1	5
13	2	0	3	3	6	3	4	2	1	5
14	1	0	3	3	6	2	4	2	0	5
15	0	0	3	3	5	2	3	2	0	5
16	0	0	2	2	5	2	3	2	0	4
17	0	0	2	2	5	1	3	1	0	4
18	0	0	2	2	5	1	2	1	0	4
19	0	0	2	2	4	0	2	0	0	4
20	0	0	1	2	4	0	2	0	0	3
21	0	0	1	1	4	0	2	0	0	3

Age 6.3 – 6.5 — 6 years, 3 months, 0 days – 6 years, 5 months, 30 days

Raw Score	Scale A	B	C	D	E	F	G	H	I	J
0	13	13	16	14	17	14	16	13	13	17
1	10	9	12	11	14	11	13	10	10	14
2	8	8	10	9	12	9	11	9	8	12
3	7	6	9	8	11	8	9	8	7	11
4	6	5	8	7	10	7	8	7	6	10
5	5	4	7	7	9	6	8	6	5	9
6	4	4	6	6	8	5	7	5	4	8
7	4	3	6	5	8	5	6	5	4	7
8	3	2	5	5	7	4	6	4	3	7
9	3	2	5	5	7	4	5	4	3	6
10	2	2	4	4	7	3	5	3	2	6
11	2	1	4	4	6	3	4	3	2	6
12	2	0	3	3	6	3	4	3	1	5
13	1	0	3	3	6	2	4	2	1	5
14	1	0	3	3	5	2	3	2	0	5
15	0	0	2	3	5	2	3	2	0	4
16	0	0	2	2	5	2	3	1	0	4
17	0	0	2	2	5	1	2	1	0	4
18	0	0	2	2	4	1	2	0	0	4
19	0	0	1	2	4	0	2	0	0	3
20	0	0	1	1	4	0	2	0	0	3
21	0	0	0	1	4	0	2	0	0	3

Table of norms 3A: Conversion of raw score to scaled scores

Age 6.6 – 6.8 6 years, 6 months, 0 days – 6 years, 8 months, 30 days

	Scale									
Raw Score	A	B	C	D	E	F	G	H	I	J
0	13	13	15	14	16	14	16	13	13	17
1	10	9	12	11	13	11	12	10	10	13
2	8	7	10	9	12	9	10	9	8	12
3	7	6	9	8	11	8	9	7	7	10
4	6	5	8	7	10	7	8	7	6	9
5	5	4	7	6	9	6	7	6	5	9
6	4	4	6	6	8	5	7	5	4	8
7	4	3	6	5	8	5	6	5	3	7
8	3	2	5	5	7	4	5	4	3	7
9	3	2	4	4	7	4	5	4	2	6
10	2	1	4	4	6	3	4	3	2	6
11	2	1	4	4	6	3	4	3	2	5
12	2	0	3	3	6	3	4	2	1	5
13	1	0	3	3	5	2	3	2	0	5
14	0	0	3	3	5	2	3	2	0	4
15	0	0	2	2	5	2	3	2	0	4
16	0	0	2	2	5	1	2	1	0	4
17	0	0	2	2	4	1	2	1	0	4
18	0	0	1	2	4	0	2	0	0	3
19	0	0	1	2	4	0	2	0	0	3
20	0	0	0	1	4	0	2	0	0	3
21	0	0	0	1	4	0	1	0	0	3

Age 6.9 – 6.11 6 years, 9 months, 0 days – 6 years, 11 months, 30 days

	Scale									
Raw Score	A	B	C	D	E	F	G	H	I	J
0	13	12	15	14	16	14	15	13	13	16
1	10	9	12	11	13	11	12	10	10	13
2	8	7	10	9	12	9	10	9	8	11
3	7	6	9	8	10	8	9	7	7	10
4	6	5	8	7	10	7	8	6	6	9
5	5	4	7	6	9	6	7	6	5	8
6	4	3	6	6	8	5	6	5	4	8
7	4	3	5	5	8	5	6	4	3	7
8	3	2	5	5	7	4	5	4	3	7
9	3	2	4	4	7	4	5	4	2	6
10	2	1	4	4	6	3	4	3	2	6
11	2	0	3	4	6	3	4	3	2	5
12	1	0	3	3	6	3	4	2	1	5
13	1	0	3	3	5	2	3	2	0	5
14	0	0	2	3	5	2	3	2	0	4
15	0	0	2	2	5	2	3	2	0	4
16	0	0	2	2	4	1	2	1	0	4
17	0	0	2	2	4	1	2	1	0	3
18	0	0	1	2	4	0	2	0	0	3
19	0	0	1	1	4	0	2	0	0	3
20	0	0	0	1	4	0	1	0	0	3
21	0	0	0	1	3	0	1	0	0	3

Age 7.0 – 7.5 7 years, 0 months, 0 days – 7 years, 5 months, 30 days

	Scale									
Raw Score	A	B	C	D	E	F	G	H	I	J
0	13	12	15	14	16	14	15	13	13	16
1	10	9	12	11	13	11	12	10	10	13
2	8	7	10	9	11	9	10	9	8	11
3	7	6	8	8	10	8	9	7	7	10
4	6	5	7	7	9	7	8	6	6	9
5	5	4	7	6	9	6	7	6	5	8
6	4	3	6	6	8	5	6	5	4	8
7	3	3	5	5	7	5	6	4	3	7
8	3	2	5	5	7	4	5	4	3	6
9	2	2	4	4	6	4	5	3	2	6
10	2	1	4	4	6	3	4	3	2	6
11	2	0	3	3	6	3	4	3	2	5
12	1	0	3	3	5	2	3	2	1	5
13	0	0	3	3	5	2	3	2	0	4
14	0	0	2	2	5	2	3	2	0	4
15	0	0	2	2	5	2	2	1	0	4
16	0	0	2	2	4	1	2	1	0	4
17	0	0	1	2	4	1	2	0	0	3
18	0	0	1	1	4	0	2	0	0	3
19	0	0	0	1	4	0	1	0	0	3
20	0	0	0	1	3	0	1	0	0	3
21	0	0	0	0	3	0	0	0	0	2

Age 7.6 – 7.11 7 years, 6 months, 0 days – 7 years, 11 months, 30 days

	Scale									
Raw Score	A	B	C	D	E	F	G	H	I	J
0	12	12	15	13	16	13	15	13	13	16
1	9	9	11	11	13	10	12	10	10	13
2	8	7	10	9	11	9	10	8	8	11
3	6	6	8	8	10	7	8	7	6	10
4	5	5	7	7	9	6	7	6	5	9
5	4	4	6	6	8	6	7	5	5	8
6	4	3	6	5	8	5	6	5	4	7
7	3	3	5	5	7	4	5	4	3	7
8	3	2	4	4	7	4	5	4	3	6
9	2	2	4	4	6	3	4	3	2	6
10	2	1	3	4	6	3	4	3	2	5
11	1	0	3	3	5	3	3	3	1	5
12	1	0	3	3	5	2	3	2	1	5
13	0	0	2	3	5	2	3	2	0	4
14	0	0	2	2	4	2	2	2	0	4
15	0	0	2	2	4	1	2	1	0	4
16	0	0	1	2	4	1	2	1	0	3
17	0	0	1	2	4	0	1	0	0	3
18	0	0	0	1	3	0	1	0	0	3
19	0	0	0	1	3	0	0	0	0	3
20	0	0	0	0	3	0	0	0	0	2
21	0	0	0	0	3	0	0	0	0	2

Table of norms 3A: Conversion of raw score to scaled scores

Age 8.0 – 8.11 8 years, 0 months, 0 days – 8 years, 11 months, 30 days

	Scale									
Raw Score	A	B	C	D	E	F	G	H	I	J
0	12	12	14	13	15	13	14	13	13	16
1	9	9	11	10	13	10	11	10	9	13
2	7	7	9	9	11	8	9	8	8	11
3	6	6	8	8	10	7	8	7	6	10
4	5	5	7	7	9	6	7	6	5	9
5	4	4	6	6	8	5	6	5	5	8
6	4	3	5	5	7	5	5	5	4	7
7	3	2	5	5	7	4	5	4	3	6
8	2	2	4	4	6	4	4	4	3	6
9	2	1	4	4	6	3	4	3	2	5
10	2	0	3	3	5	3	3	3	2	5
11	1	0	3	3	5	2	3	2	1	5
12	0	0	2	3	5	2	3	2	0	4
13	0	0	2	2	4	2	2	2	0	4
14	0	0	2	2	4	1	2	2	0	4
15	0	0	1	2	4	1	2	1	0	3
16	0	0	1	2	4	0	1	1	0	3
17	0	0	0	1	3	0	1	0	0	3
18	0	0	0	1	3	0	0	0	0	3
19	0	0	0	0	3	0	0	0	0	2
20	0	0	0	0	3	0	0	0	0	2
21	0	0	0	0	3	0	0	0	0	2

Age 9.0 – 9.11 9 years, 0 months, 0 days – 9 years, 11 months, 30 days

	Scale									
Raw Score	A	B	C	D	E	F	G	H	I	J
0	12	12	14	13	15	13	14	13	12	15
1	9	9	11	10	12	10	11	10	9	12
2	7	7	9	8	10	8	9	8	7	10
3	6	5	7	7	9	7	7	7	6	9
4	5	4	6	6	8	6	6	6	5	8
5	4	4	6	6	7	5	6	5	4	7
6	3	3	5	5	7	4	5	5	4	7
7	3	2	4	4	6	4	4	4	3	6
8	2	2	4	4	6	3	4	4	3	6
9	2	1	3	3	5	3	3	3	2	5
10	1	0	3	3	5	3	3	3	2	5
11	0	0	2	3	5	2	2	2	1	4
12	0	0	2	2	4	2	2	2	0	4
13	0	0	2	2	4	1	2	2	0	4
14	0	0	1	2	4	1	1	1	0	3
15	0	0	0	2	3	0	1	1	0	3
16	0	0	0	1	3	0	0	0	0	3
17	0	0	0	1	3	0	0	0	0	2
18	0	0	0	0	3	0	0	0	0	2
19	0	0	0	0	2	0	0	0	0	2
20	0	0	0	0	2	0	0	0	0	2
21	0	0	0	0	2	0	0	0	0	2

Age 10.0 – 10.11 10 years, 0 months, 0 days – 10 years, 11 months, 30 days

	Scale									
Raw Score	A	B	C	D	E	F	G	H	I	J
0	12	12	14	13	14	13	13	13	12	15
1	8	8	10	10	12	10	10	10	9	12
2	7	7	8	8	10	8	8	8	7	10
3	5	5	7	7	9	7	7	7	6	9
4	4	4	6	6	8	6	6	6	5	8
5	4	3	5	5	7	5	5	5	4	7
6	3	3	4	5	6	4	4	4	4	6
7	2	2	4	4	6	4	4	4	3	6
8	2	1	3	4	5	3	3	3	2	5
9	1	0	3	3	5	3	3	3	2	5
10	0	0	2	3	5	2	2	3	1	4
11	0	0	2	2	4	2	2	2	1	4
12	0	0	1	2	4	2	2	2	0	4
13	0	0	1	2	4	1	1	2	0	3
14	0	0	0	2	3	0	0	1	0	3
15	0	0	0	1	3	0	0	0	0	3
16	0	0	0	0	3	0	0	0	0	2
17	0	0	0	0	2	0	0	0	0	2
18	0	0	0	0	2	0	0	0	0	2
19	0	0	0	0	2	0	0	0	0	2
20	0	0	0	0	2	0	0	0	0	1
21	0	0	0	0	2	0	0	0	0	1

Age 11.00 – 11.11 11 years, 0 months, 0 days – 11 years, 11 months, 30 days

	Scale									
Raw Score	A	B	C	D	E	F	G	H	I	J
0	11	12	13	12	14	13	13	12	12	15
1	8	8	10	10	11	10	10	10	9	12
2	6	6	8	8	10	8	8	8	7	10
3	5	5	7	7	8	6	7	7	6	8
4	4	4	6	6	7	6	6	6	5	7
5	3	3	5	5	7	5	5	5	4	7
6	3	2	4	4	6	4	4	4	3	6
7	2	2	3	4	5	3	3	4	3	5
8	2	1	3	3	5	3	3	3	2	5
9	1	0	2	3	5	2	2	3	2	4
10	0	0	2	3	4	2	2	2	1	4
11	0	0	2	2	4	2	2	2	0	4
12	0	0	1	2	3	1	1	2	0	3
13	0	0	0	2	3	1	0	1	0	3
14	0	0	0	1	3	0	0	1	0	3
15	0	0	0	1	3	0	0	0	0	2
16	0	0	0	0	2	0	0	0	0	2
17	0	0	0	0	2	0	0	0	0	2
18	0	0	0	0	2	0	0	0	0	2
19	0	0	0	0	2	0	0	0	0	1
20	0	0	0	0	1	0	0	0	0	1
21	0	0	0	0	1	0	0	0	0	0

Table of norms 3A: Conversion of raw score to scaled scores

Age 12.00 – 12.11 12 years, 0 months, 0 days – 12 years, 11 months, 30 days

	Scale									
Raw Score	A	B	C	D	E	F	G	H	I	J
0	11	11	13	12	14	12	13	12	12	14
1	8	8	10	9	11	9	9	9	9	11
2	6	6	8	8	9	8	8	8	7	9
3	5	5	6	7	8	6	6	7	6	8
4	4	4	5	6	7	5	5	6	5	7
5	3	3	4	5	6	5	4	5	4	6
6	2	2	4	4	6	4	4	4	3	6
7	2	2	3	4	5	3	3	4	3	5
8	1	1	3	3	5	3	2	3	2	5
9	0	0	2	3	4	2	2	3	2	4
10	0	0	2	2	4	2	2	2	1	4
11	0	0	1	2	3	2	1	2	0	3
12	0	0	0	2	3	1	0	2	0	3
13	0	0	0	1	3	0	0	1	0	3
14	0	0	0	1	3	0	0	0	0	2
15	0	0	0	0	2	0	0	0	0	2
16	0	0	0	0	2	0	0	0	0	2
17	0	0	0	0	2	0	0	0	0	1
18	0	0	0	0	2	0	0	0	0	1
19	0	0	0	0	1	0	0	0	0	1
20	0	0	0	0	1	0	0	0	0	0
21	0	0	0	0	0	0	0	0	0	0

Age 13.00 – 13.11 13 years, 0 months, 0 days – 13 years, 11 months, 30 days

	Scale									
Raw Score	A	B	C	D	E	F	G	H	I	J
0	11	11	13	12	14	12	12	12	12	14
1	8	8	9	9	11	9	9	9	9	11
2	6	6	8	8	9	7	7	8	7	9
3	5	5	6	6	8	6	6	6	6	8
4	4	4	5	5	7	5	5	5	5	7
5	3	3	4	5	6	4	4	5	4	6
6	2	2	3	4	5	4	3	4	3	5
7	2	2	3	3	5	3	3	4	3	5
8	1	1	2	3	4	3	2	3	2	4
9	0	0	2	3	4	2	2	3	2	4
10	0	0	1	2	4	2	1	2	1	3
11	0	0	0	2	3	1	0	2	0	3
12	0	0	0	1	3	1	0	1	0	3
13	0	0	0	1	3	0	0	1	0	2
14	0	0	0	0	2	0	0	0	0	2
15	0	0	0	0	2	0	0	0	0	2
16	0	0	0	0	2	0	0	0	0	2
17	0	0	0	0	2	0	0	0	0	1
18	0	0	0	0	1	0	0	0	0	1
19	0	0	0	0	1	0	0	0	0	0
20	0	0	0	0	0	0	0	0	0	0
21	0	0	0	0	0	0	0	0	0	0

Age 14.00 – 14.11 14 years, 0 months, 0 days – 14 years, 11 months, 30 days

	Scale									
Raw Score	A	B	C	D	E	F	G	H	I	J
0	11	11	12	12	13	12	12	12	12	14
1	8	8	9	9	10	9	9	9	9	11
2	6	6	7	7	9	7	7	8	7	9
3	5	5	6	6	8	6	6	6	6	8
4	4	4	5	5	7	5	5	5	5	7
5	3	3	4	5	6	4	4	5	4	6
6	2	2	3	4	5	4	3	4	3	5
7	1	1	3	3	5	3	2	3	3	5
8	0	0	2	3	4	2	2	3	2	4
9	0	0	2	2	4	2	1	2	2	4
10	0	0	1	2	3	2	0	2	1	3
11	0	0	0	2	3	1	0	2	0	3
12	0	0	0	1	3	0	0	1	0	2
13	0	0	0	1	2	0	0	1	0	2
14	0	0	0	0	2	0	0	0	0	2
15	0	0	0	0	2	0	0	0	0	2
16	0	0	0	0	1	0	0	0	0	1
17	0	0	0	0	1	0	0	0	0	1
18	0	0	0	0	1	0	0	0	0	0
19	0	0	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0	0	0
21	0	0	0	0	0	0	0	0	0	0

Age 15.00 – 15.11 15 years, 0 months, 0 days – 15 years, 11 months, 30 days

	Scale									
Raw Score	A	B	C	D	E	F	G	H	I	J
0	10	11	12	12	13	12	12	12	12	14
1	7	8	9	9	10	9	9	9	9	11
2	6	6	7	7	8	7	7	7	7	9
3	4	5	6	6	7	6	5	6	6	8
4	3	4	5	5	6	5	4	5	5	7
5	3	3	4	4	6	4	3	5	4	6
6	2	2	3	4	5	3	3	4	3	5
7	1	1	2	3	4	3	2	3	2	4
8	0	0	2	3	4	2	2	3	2	4
9	0	0	1	2	3	2	1	2	1	3
10	0	0	0	2	3	1	0	2	1	3
11	0	0	0	1	3	1	0	2	0	3
12	0	0	0	1	2	0	0	1	0	2
13	0	0	0	0	2	0	0	0	0	2
14	0	0	0	0	2	0	0	0	0	2
15	0	0	0	0	2	0	0	0	0	1
16	0	0	0	0	1	0	0	0	0	1
17	0	0	0	0	1	0	0	0	0	0
18	0	0	0	0	0	0	0	0	0	0
19	0	0	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0	0	0
21	0	0	0	0	0	0	0	0	0	0

Table of norms 3A: Conversion of raw score to scaled scores

Age 16.00 – 16.11 16 years, 0 months, 0 days – 16 years, 11 months, 30 days

	Scale									
Raw Score	A	B	C	D	E	F	G	H	I	J
0	10	11	12	12	13	12	11	12	12	14
1	7	8	9	9	10	9	8	9	9	10
2	5	6	7	7	8	7	6	7	7	9
3	4	4	5	6	7	6	5	6	6	7
4	3	3	4	5	6	5	4	5	5	6
5	2	3	4	4	5	4	3	4	4	6
6	2	2	3	4	5	3	3	4	3	5
7	1	1	2	3	4	3	2	3	2	4
8	0	0	2	3	4	2	1	3	2	4
9	0	0	1	2	3	2	0	2	1	3
10	0	0	0	2	3	1	0	2	0	3
11	0	0	0	1	2	0	0	2	0	2
12	0	0	0	1	2	0	0	1	0	2
13	0	0	0	0	2	0	0	0	0	2
14	0	0	0	0	2	0	0	0	0	1
15	0	0	0	0	1	0	0	0	0	1
16	0	0	0	0	1	0	0	0	0	0
17	0	0	0	0	0	0	0	0	0	0
18	0	0	0	0	0	0	0	0	0	0
19	0	0	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0	0	0
21	0	0	0	0	0	0	0	0	0	0

3B: Ranges for consistency check

positive sum*	to pass check, negative sum must be greater than
31	12
32	15
33	17
34	20
35	22
36	25
37	27
38	30
39	32
40	35
41	37
42	40
43	42
44	45
45	47
46	50
47	52
48	55
49	57
50	60
51	62
52	65
53	67
54	70
55	72
56	75
57	77
58	80
59	82
60	85

* If the Positive Sum is 30 or less, the consistency check is passed.

3C: Conversion of scaled scores to percentiles for individual scales

	scale									
scaled score	A	B	C	D	E	F	G	H	I	J
0	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
1	<1	1	<1	<1	<1	<1	<1	<1	<1	<1
2	1	2	1	1	<1	<1	<1	1	1	<1
3	3	3	2	2	1	2	1	1	2	<1
4	6	6	4	4	1	3	3	5	6	1
5	10	10	6	8	5	6	5	9	9	5
6	14	15	12	14	10	14	12	15	14	10
7	22	22	19	22	23	23	23	22	23	20
8	30	28	32	32	36	36	34	33	31	36
9	37	37	45	42	49	44	46	42	38	50
10	45	45	57	53	60	55	56	54	52	63
11	62	56	67	59	69	61	67	59	54	71
12	81	80	76	75	77	73	77	70	74	79
13	91	95	87	90	84	88	87	91	95	83
14	97	>99	95	96	91	95	94	>99	>99	90
15	>99	>99	97	>99	97	>99	97	>99	>99	97
16	>99	>99	>99	>99	99	>99	99	>99	>99	99
17	>99	>99	>99	>99	99	>99	>99	>99	>99	99
18	>99	>99	>99	>99	>99	>99	>99	>99	>99	99
19	>99	>99	>99	>99	>99	>99	>99	>99	>99	>99

3D: Percentile equivalents for GCC scores

GCC	percentile
<28	<1
28-32	1
35-37	2
38-40	3
42-43	4
44-45	5
46-47	6
48-49	7
50	8
51-53	9
54	10
55	11
56	12
57	13
58	14
59-60	15
61	16
62	17
63	18
64	20
65	21
66	24
67	25
68	27
69	28
70	30
71	32
72	33
73	36
74	38
75	40
76	42
77	44
78-79	45
80	47
81	49
82	50
83	52
84	53
85	55
86	58
87	60
88	63
89	64
90	67
91	69
92	70
93	72
94	74
95	77
96	79
97	82
98	84
99	85
100	86
101	88
102	89
103-105	92
106+	95+

Appendix 4: Items corresponding to each CCC-2 scale[1]

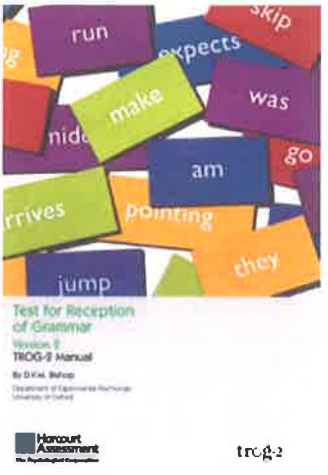
scale	Items
A	2, 24, 29, 38, 44, 51, 58
B	1, 17, 27, 36, 43, 55, 69
C	4, 6, 12, 32, 46, 64, 66
D	10, 25, 40, 48, 50, 53, 68
E	5, 21, 35, 37, 45, 59, 70
F	11, 18, 23, 30, 42, 61, 62
G	15, 19, 28, 34, 41, 54, 60
H	8, 14, 20, 31, 39, 56, 65
I	3, 7, 13, 16, 33, 57, 67
J	9, 22, 26, 47, 49, 52, 63

[1] For each scale, the first five items are negative, and the last two positive.

The Children's Communication Checklist

Second Edition
CCC-2 Manual

By D.V.M. Bishop
Department of Experimental Psychology
University of Oxford



Test for Reception of Grammar

Version 2
TROG-2 Manual

By D.V.M. Bishop
Department of Experimental Psychology
University of Oxford

Expression, Reception and Recall of Narrative Instrument

ERRNI Manual

By D.V.M. Bishop
Department of Experimental Psychology
University of Oxford

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