

Technical report:

Infant Language Link

The critical relationship between language and learning is well documented (Goswami & Bryant, 2007). Children with language impairments are at greater risk of developing literacy difficulties (Dockrell et al., 2007). Language, in particular, vocabulary skills at school entry, provide a powerful predictor of later academic achievement (Snowling et al., 2011; Roulstone et al., 2011; Lee, 2011; Block & Mangieri, 2006).

The prevalence of language difficulties in pupils aged between 4-5 years is generally reported to be between 2% and 19% (Law et al., 2000). This figure is generally regarded as much higher for pupils from socially deprived backgrounds. Teachers are under increasing pressure to both identify and support pupils with SLCN as early as possible at a time when access to specialist support is threatened.

Infant Language Link is an identification and intervention package devised by Speech and Language Therapists and used by over 2,600 mainstream schools. The online standardised assessment is used to identify developmental difficulties with understanding of spoken language in children aged 4 - 8 years old. It is also suitable for those new to English and will identify gaps in their understanding.

The assessment will highlight any pupils who need to be seen by Speech and Language Therapists. The package suggests interventions at universal and targeted levels through use of strategies, planned language groups and 1:1 activities. The website provides information about a wide variety of speech and language issues with advice on how best to develop language skills to support literacy and boost attainment.

The Infant Language Link Assessment

The Infant Language Link assessment is delivered online. It consists of 64 items presented across 8 sub-tests: Concepts, Verb Tenses, Instructions, Pronouns, Negatives, Questions, Verbal Reasoning and Association.

Pupils are presented with a choice of 3 or 4 pictures and a recorded verbal prompt. The distractor pictures vary in syntactic or semantic elements. The test takes about 25 minutes to administer. All pictures and probes were reviewed by an expert panel for their suitability and relevance for the age group of the children concerned. Particular care was taken with selection of familiar scenarios, vocabulary and cultural relevance.

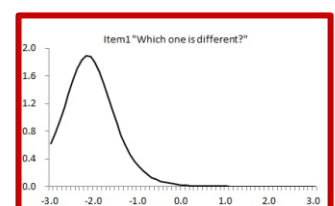
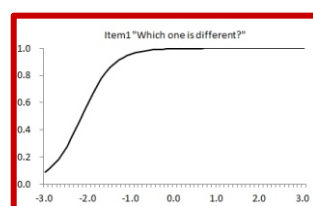
Scores are reported as a total score and section scores. Standard scores and percentile ranks are presented for the total score. Students are flagged for support at different levels. The assessment is used as a universal screen at school entry and then to track any identified pupils across KS1.

Sub-test	Description
Concepts	Tests the understanding of simple concept vocabulary
Verb Tenses	Tests the understanding of simple past and present verb forms
Instructions	Tests the understanding of sentences involving simple concepts and sequences
Pronouns	Tests the understanding of simple personal pronouns
Negatives	Tests the understanding of early negatives forms
Questions	Tests the understanding of basic questions words
Verbal Reasoning	Tests the understanding of simple cause and effect relationships and why questions
Association	Tests the ability to make links between vocabulary items

Selection of test items

Infant Language Link is comprised of two equated assessments; Reception and Infant. The Reception test was based on a previous criterion referenced test with some additional test items. Data were available from 35,000 pupils aged between 4:00 and 5:06 years for this test. The Infant test shares many items with the Reception test with the addition of some more challenging questions.

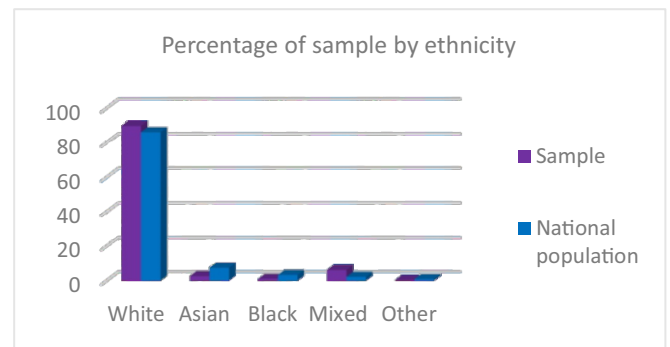
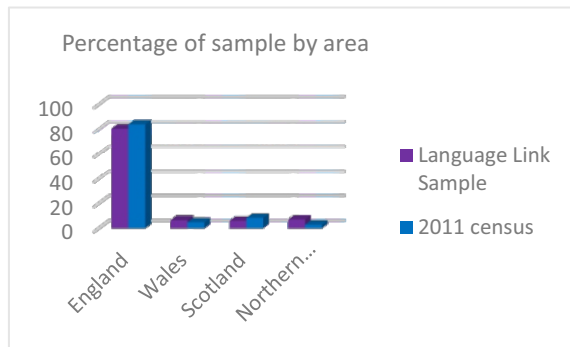
Two small scale pilots were carried out to select the final items. Selection was based on a number of criteria: the pass rate, the bi-serial correlation coefficient, the item response function, the item information function, the item category response line, the correlation between the item and the total test score, the discrimination parameter, the difficulty parameter and feedback from testers.



Example Item Response Function and Information Function graphs

Standardisation study

In total 33, 002 pupils aged between 4:0 and 8:06 years, from 1062 schools made up the standardisation sample. 51% were male and 49% were female.



Reliability

To observe internal consistency for raw score calibration, Cronbach's alpha was calculated for the Infant Language Link test as 0.898, indicating a high consistency within the test.

To establish test-retest reliability all schools within the standardisation sample were asked to retest a small number of pupils. In total 41 pupils from 130 schools completed initial and retests. Pearson correlations between the raw score achieved on the first test and the retest were high across all age bands (0.89) indicating good test retest reliability.

Age Band	Initial Mean (SD)	Retest Mean (SD)	Pearson's R
4:00 - 5:11	40.5 (9.55)	43.8 (9.03)	0.96
6:00 - 8:04	43.2 (6.97)	46.1 (8.56)	0.83
All ages	42.1 (8.14)	45.1 (8.72)	0.89

Validity

Concurrent validity was investigated by comparing scores on Infant Language Link with their scores on sub-tests from widely used standardised language assessments. In total 142 pupils from 9 schools were involved in the concurrent validity study. The correlation coefficients indicate that the Infant Language Link assessment provides sufficient and discriminant validity (CELF C&I 0.685, TROG-2 0.759).

Age Band	CELF 4 UK C&I Scaled score (SD)	Preschool CELF-2 C&I Scaled score (SD)	TROG-2 Scaled score (SD)	Infant Language Link Raw score (SD)
4:00 - 4:11	N/A	9.5 (2.06)	91.3(12.07)	35.7 (6.81)
5:00 - 5:11	7.7 (3.54)	N/A	86.4 (15.1)	41.8 (8.14)
6:00 - 6:11	5.6 (3.69)	N/A	80.1 (21.44)	44.0 (8.83)
7:00 - 7:11	8.1 (3.98)	N/A	87.7 (19.8)	48.7 (6.69)
8:00 +	7.6 (3.77)	N/A	81.5 (18.8)	48.7 (6.69)
All ages	7.1 (3.80)	9.5 (2.06)	86.0 (17.88)	42 (9.02)
Correlation	0.685	0.585	0.759	1.00

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